CONTENTS

INDEX OF FIGURES AND TABLES 1-2
SECTION ONE, THE INTRALOX SYSTEM
Belt Construction 1-4
Drive Method 1-4
Design Requirements 1-4
Belt Selection Process 1-5
Intralox Services 1-10
SECTION TWO, PRODUCT LINE
How To Use The Section 2-1
Standard Belt Materials and Special Application Belt Materials 2-2
Belt Material Properties 2-3
Belt Style and Material Availability Table 2-4
General Application Sprocket Materials and Special Application Sprocket Materials 2-5
Sprocket Material Availability 2-6
Belt Selection Instructions 2-7
STRAIGHT RUNNING BELTS
Series 100 2-9
Series 200 2-15
Series 400 2-23
Series 800 2-33
Series 900 2-45
Series 1100 2-61
Series 1400 2-69
Series 1800 2-75
Series 3000 Knuckle Chain (Straight) 2-89
SIDEFLEXING BELTS
Intraflex™ 2000 2-77
Series 2200 2-81
Series 2400 2-85
Series 3000 Knuckle Chain (Turning) 2-89
Series 4000 2-91
Square Shafts 2-95
Retainer Rings 2-96
Scroll Idlers 2-97
Wearstrips 2-98
Custom Wearstrips 2-99
Pusher Bars 2-100
Hold Down Rollers 2-101
Abrasion Resistance System 2-102
Abrasion Resistant Hinge Rods 2-103
SECTION THREE, DESIGN GUIDELINES
Basic Conveyor Frame Requirements 3-2
Dimension definitions
Drive Guidelines 3-4
Shaft size and materials, Drive shaft torque loading, Power requirements, Retaining sprockets, Use of round shafts, Intermediate bearings, Rollers as idle shafts/sprocket replacements, Soft start motors and fluid couplings
Belt Carryways 3-6
Solid plate carryways, Wearstrip carryways, Anti-sag carryway wearstrip configuration, Wearstrip design considerations, Rollers as carryways,
Returnways and Take-ups 3-8
Control of belt length, Back tension, Standard returnways, Special take-up arrangements
Special Conveyors 3-11
Bi-directional conveyors, Elevating conveyors, Sideflexing conveyors, Tight transfer methods for **Series 1100**
Transfer Design Guidelines 3-17
End-off/end-on transfers, 90˚ container transfers, Vacuum transfers
Special Design Guidelines 3-20
Thermal expansion and contraction, Expansion due to water absorption, "Slip-stick" effect
SECTION FOUR, FORMULAS AND TABLES
Symbols Used 4-1
Formulas 4-2
Sample Problems 4-5
Tables 4-9
Measurement Conversion Factors 4-15
Chemical Resistance Guide 4-16
Straight Running Belt Data Sheet 4-21
Radius Belt Data Sheet 4-23
Spiral Belt Data Sheet 4-25
GLOSSARY 4-27
INDEX 4-30

intralox®

MODULAR PLASTIC CONVEYOR BELTS

Conveyor Belting Engineering Manual

WARRANTY

Intralox, Inc. warrants products of its own manufacture for a period of one year from date of shipment to the extent that Intralox, Inc. will repair or replace any products of faulty material or defective workmanship proven under normal use or service. No other warranty is expressed or implied unless otherwise set forth in writing and approved by a representative duly authorized to extend such approval by Intralox, Inc.

CAUTION

Intralox, Inc. does not warrant that the design and/or operational function of any machine that incorporates and/or intends to incorporate Intralox, Inc. products, conform to any local, state and/or federal regulations and standards relating to public safety, worker safety, safety guards, sanitation safety, fire safety, or any other safety regulations. ALL PURCHASERS AND USERS SHOULD CONSULT THEIR APPROPRIATE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS AND STANDARDS.

NOTICE

The information contained in this manual is provided only as an aid and service to our customers. Intralox, Inc. does not warrant the accuracy or applicability of such information and, Intralox, Inc. is specifically not responsible for property damage and/or personal injury, direct or indirect for damages and/or failures caused by improper machine design, application, installation, operation, abuse and/or misuse of its products whether or not based on information contained herein.

WARNING:

FLAMMABLE

Intralox products are made of plastic and are flammable. If exposed to open flame or to temperatures above Intralox specifications, these products can burn and may emit dangerous and toxic fumes. Do not expose Intralox conveyor belting to extreme temperatures or open flame. Flame retardant belt products are available in some series. Contact Intralox.

MAINTENANCE

Prior to installing, aligning, cleaning, lubricating or performing maintenance on any conveyor belt, sprocket or system, consult the federal, state and local regulations, in your area, regarding the control of hazardous/stored energy (lockout/ tagout).

FOR CUSTOMER SERVICE AND SALES ENGINEERING ASSISTANCE, CALL THE TOLL FREE NUMBERS LISTED ON THE BACK COVER OF THIS MANUAL.

FOR OTHER INTRALOX SERVICES, SEE PAGE 1-10.

LOOK FOR NEW INTRALOX PRODUCTS AND ACCESSORIES IN FUTURE EDITIONS OF THE INTRALOX ENGINEERING MANUAL

INDEX OF FIGURES AND TABLES

FIGURES

FIGURE #	DESCRIPTION	PAGE
2-1	HOLD DOWN RAILS AND WEARSTRIPS FOR INTRAFLEX 2000 FLAT-TURNS	2-80
2-2, 2-5, 2-9	TYPICAL 2-TURN RADIUS LAYOUT	2-80, 2-84, 2-88
2-3	HIGH FRICTION MODULE	2-83
2-4	HOLD DOWN RAILS AND WEARSTRIPS FOR SERIES 2200 FLAT-TURNS	2-84
2-6	SERIES 2400 FRICTION MODULE	2-87
2-7	SERIES 2400 HOLD DOWN GUIDES	2-87
2-8	HOLD DOWN RAILS AND WEARSTRIPS FOR SERIES 2400 FLAT-TURNS	2-88
2-10	SHAFT DIMENSIONS	2-95
2-11	RETAINER RINGS	2-96
2-12	FLAT FINGER-JOINT WEARSTRIPS	2-98
2-13A	120" UHMW SERIES 2000 CUSTOM WEARSTRIPS	2-99
2-13B	120" UHMW RADIUS BELT CUSTOM WEARSTRIPS	2-99
2-14	PUSHER BAR SIDE VIEW	2-100
2-15	PUSHER BAR ASSEMBLY	2-100
2-16	DUAL BLADE PUSHER BAR ASSEMBLY	2-100
2-17	ABRASION RESISTANT RODS AND RODLETS	2-103
2-18	SERIES 1100 SIDE VIEW	2-103
2-19	THERMALLY DEFORMED BELT EDGE	2-103
2-20	SERIES 1400 WITH SLIDELOX™	2-103
3-1	CONVENTIONAL CONVEYOR COMPONENTS	3-1
3-2	BASIC DIMENSIONAL REQUIREMENTS (ROLLER RETURNWAY)	3-2
3-3A	CHORDAL EFFECTS - BOTTOM OF RANGE	3-2
3-3B	CHORDAL EFFECTS - TOP OF RANGE	3-2
3-4	TYPICAL SHAFT FEATURES	3-4
3-5	INTERMEDIATE BEARINGS RECOMMENDED MOUNTING ARRANGEMENT	3-6
3-6	STRAIGHT, PARALLEL WEARSTRIP ARRANGEMENT	3-6
3-7	CHEVRON WEARSTRIP ARRANGEMENT	3-7
3-8	BUCKLING BELT ROWS	3-7
3-9	ANTI-SAG CONFIGURATION	3-7
3-10	SHORT CONVEYORS (less than 6' [1.8 m])	3-9
3-11	MEDIUM TO LONG CONVEYORS (6' [1.8 m] and longer)	3-9
3-12	CONVEYORS WITH SLIDE BEDS	3-9
3-13	GRAVITY STYLE TAKE-UP	3-10
3-14	CENTER-DRIVEN BI-DIRECTIONAL CONVEYOR	3-11
3-15	PUSH-PULL BI-DIRECTIONAL CONVEYOR	3-12
3-16	INCLINE CONVEYOR	3-13
3-17	DECLINE CONVEYOR	3-13
3-18	ELEVATING CONVEYOR WITH BELT EDGE SLIDER RETURN	3-14
3-19	ELEVATING CONVEYOR WITH WIDE SIDEGUARDS AND SHOE RETURN	3-14
3-20	ELEVATING CONVEYOR WITH SHOE RETURN	3-14
3-21	HOLD DOWN ROLLER	3-15
3-22A	HOLD DOWN ROLLER, SIDE VIEW	3-15
3-22B	LINEAR SPACING OF HOLD DOWN ROLLERS	3-15
3-23	SERIES 1100 NOSEBAR CONFIGURATION — END DRIVE	3-16
3-24	FINGER TRANSFER PLATES DIMENSIONAL REQUIREMENTS	3-17
3-25	DEAD PLATE GAP	3-18
3-26	CONVENTIONAL FULL RADIUS GUIDE RAIL CONTOURS	3-19
3-27	PARABOLIC GUIDE RAIL CONTOURS	3-19
3-28	PARABOLIC GUIDE RAIL CONTOURS WITH 6.0 in. (152 mm) ONEPIECE™LIVE TRANSFER BELT	3-19
4-2	CATENARY SAG	4-5

TABLES

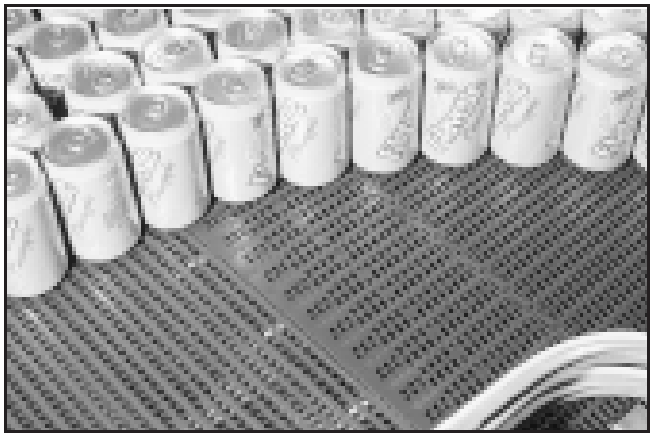
TABLE #	DESCRIPTION	PAGE
1	BELT WEIGHT	4-9
2A	COEEFICIENT OF FRICTION, STARTUP	4-9
2B	COEFFICIENT OF FRICTION, RUNNING	4-9
3	BELT STRENGTH	4-10
4	SPROCKET AND SUPPORT QUANTITY REFERENCE	4-11
5	SERVICE FACTOR	4-11
6	TEMPERATURE FACTOR	4-12
7	SHAFT DATA	4-13
8	MAXIMUM RECOMMENDED TORQUE ON DRIVE SHAFT	4-13
9	AIR FLOW RATE	4-13
10	MAXIMUM DRIVE SHAFT SPAN LENGTH	4-14

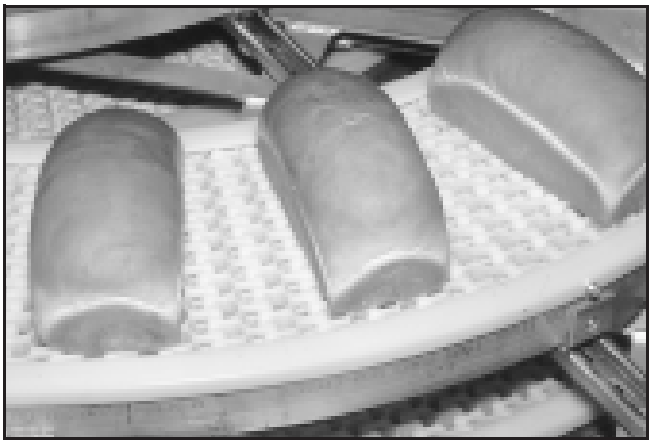
In the early 1970's, Intralox belts revolutionized the conveyance of industrial and food products with a brand new style of belt: modular plastic conveyor belts.

Constructed of plastic modules and hinge rods, and driven and tracked by plastic sprockets, Intralox belts have the inherent qualities plant operators and designers look for: corrosion resistance, positive drives, high strength, lower friction characteristics and abrasion resistance.

In addition to these characteristics, Intralox belt designs help keep the plant cleaner, reduce downtime for maintenance and make belt repairs a quicker, easier process.

Intralox, Inc. has over 150 different combinations of belt styles, materials and colours to choose from. We've been helping processors convey more efficiently for more than 25 years.





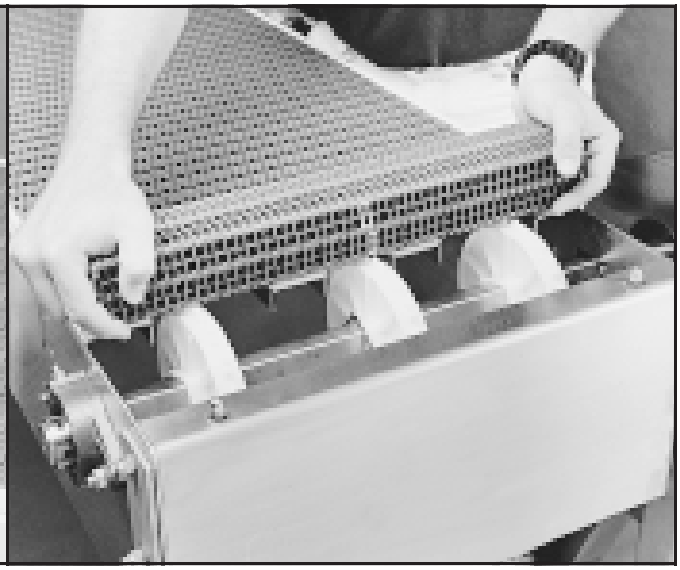
This manual will give you technical information about our products and their uses. But, high quality belts and accessories are only *part* of the total package Intralox offers to customers.

When you buy an Intralox belt, you get all of the support and service that has made Intralox the leading modular plastic conveyor belt supplier in the world:

- Local District Managers - belt recommendations are backed with a money back guarantee.
- 24 hour Customer Service, 365 days a year. More than 50 Customer Service Representatives - 11 languages represented.
- Technical Support to assist you in any emergency.
- A 99+% on time ship rate.

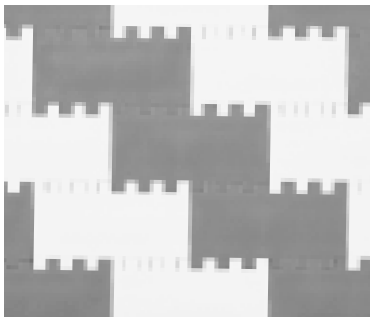
Intralox will help you find the right belt for your application. Call us today at the toll free numbers listed on the back cover.

WARNING: ALL PUBLISHED METRIC MEASUREMENTS ARE CONVERSIONS FROM IMPERIAL.



BELT CONSTRUCTION

All Intralox belts are constructed with injection-moulded plastic modules. These are assembled into interlocked units and joined by plastic hinge rods. Except for narrow belts (one complete module or less in width), all are built with the joints between modules staggered with those of adjacent rows in a "bricklayed" fashion. This structure interlocks the modules, giving the belt inherent lateral strength. The hinge rods do not hold the belt together from side to side, but act only as pivot members in shear. The belt that results from this construction process is intrinsically strong, both laterally due to the bricklaying, and longitudinally due to the rods being placed in multiple shear.



BRICKLAYED MODULES

Because of modular construction, Intralox belts can be made in almost any width from three links wide.

Each belt style incorporates several distinguishing features. Hinge and edge features are described below. Surface, pitch and drive features are described in detail in Step Three of the **Belt Selection Process**.

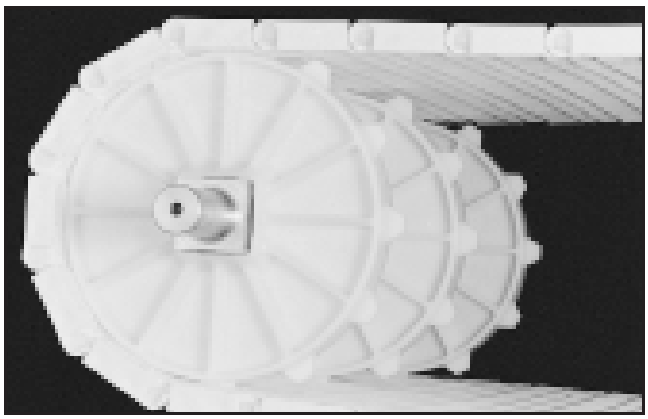
OPEN HINGES — The hinge rods are visible from either the top or bottom surface (or both) of the belt to aid in belt inspection.

CLOSED HINGES — The hinge rods are completely enclosed to protect them from abrasives or contaminants.

FLUSH EDGES — Flush edges ride snugly beside the conveyor frame rails without gaps or exposed rod heads. They reduce the possibility of product, or belt, snagging on the frame.

DRIVE METHOD

Intralox belts are *positively driven* by plastic or metal sprockets, not friction rollers. The sprockets, another part of the Intralox System, have *square bores* and are driven by matching *square shafts*. (Note: Some sprockets are available with round bores for special applications.) Not only do square shafts transmit torque (rotational force) without the need for troublesome keys and keyways, they accommodate the lateral expansion differences of the plastic belt material and the metal shafts. Only one sprocket per shaft is retained. The others are allowed to "float", moving along the shaft as the belt expands or contracts. Thus, the sprockets are always transmitting torque. Of all belt drive systems tested, the square shaft with square bore sprockets has proven to be the most effective, economical, reliable, trouble free and simple.



DESIGN REQUIREMENTS

Intralox conveyor belts are available in a variety of styles, materials and colours, with many accessory options. In order to make the appropriate selections when designing for a particular application, reliable information about operating and environmental conditions is critical.

Factors to evaluate include:

- The *type of belt system*: straight running or sideflexing
- The overall *dimensions* of the installed belt: length between driving and idling shafts, width, elevation changes
- The *speed* of belt travel
- The *characteristics of the product* to be conveyed:
  1. density
  2. unit size and shape
  3. hardness, toughness, brittleness, rigidity
  4. texture (smooth, rough, granular, lumpy, spongy. . .)
  5. corrosiveness
  6. moisture content
  7. temperature
  8. frictional nature

- Any *process change in the product* during conveyance:
  1. heating
  2. cooling
  3. washing, rinsing, draining
  4. drying
- The *sanitary and cleanliness requirements and conditions*:
  1. USDA approval
  2. harsh temperatures or chemicals
  3. continuous on-line cleaning
- The *planned methods of product loading and removal* — smooth or impact transfers
- The *characteristics of the operating environment*:
  1. temperature
  2. moisture, humidity
  3. chemical nature (acid, base, etc.)
  4. abrasive materials (sand, grit, etc.)
  5. hazardous materials (dusts, vapours, etc.)
- The *type of drive system*:
  1. motors
  2. chains.

For more detailed information, refer to Section Three, **Design Guidelines**.

BELT SELECTION PROCESS

STEP ONE: Choose the right type of **BELT SYSTEM** — straight running or sideflexing.

All Intralox belts can be used as straight running belts. Five belts, **Intraflex 2000 Raised Rib**, **Series 2200 Flush Grid, Series 2400, Series 3000 Turning Knuckle Chain** and **Series 4000** are designed for sideflexing applications.

STEP TWO: Choose the right MATERIAL for your application.

Intralox belts and accessories are available in standard materials, including **Polypropylene**, **Polyethylene**, **Acetal** and **Electrically Conductive (EC) Acetal**, as well as special application materials, including **Heat Resistant (HR) Nylons, Impact Resistant (IR) Nylon** and **Flame Retardant Thermoplastic Polyester (FR-TPES)**.

These materials are described briefly below. For complete descriptions of the standard and special application belt materials, please refer to the introduction of Section Two, **Product Line**, page 2-2.

Polypropylene, a standard material for general application, has good chemical resistance to many acids, bases, salts and alcohols. A relatively strong material in normal use, Polypropylene exhibits a somewhat brittle quality at low temperatures.

Polyethylene has superior fatigue resistance, high-impact strength and flexibility. It is also chemically resistant to many acids, bases and hydrocarbons.

Acetal thermoplastics, considerably stronger than Polypropylene and Polyethylene, have a good balance of mechanical, thermal and chemical properties. They also have a low coefficient of friction.

Electrically Conductive (EC) Acetal contains additives which significantly reduce its electrical resistance, thus helping to dissipate static.

Heat Resistant (HR) Nylons offer the ability to operate at elevated temperatures where standard materials are not recommended. These materials will absorb water and expand in wet environments. They are available in both FDA and non FDA grades.

Impact Resistant (IR) Nylon can be used in place of standard acetal for those impact intensive applications. This material does absorb water and is more susceptible to cuts and gouges than acetal.

Flame Retardant Thermoplastic Polyester (FR-TPES) is formulated so it will not sustain a flame.

Contact the Intralox Sales Engineering Department or Customer Service for more information concerning our materials. Current telephone numbers are listed on the back cover.

For specific recommendations on chemical properties, see the **Chemical Resistance Guide** beginning on page 4-16 in Section Four, **Formulas and Tables**.

STEP THREE: Select the best belt surface, pitch and drive method.

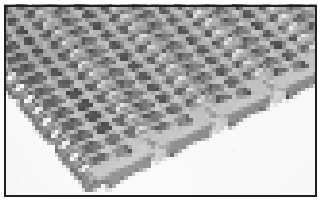
Next in the process of choosing the belt for your application is to determine the **BELT SURFACE** or **STYLE** best suited for the product or material being conveyed.

The **PITCH** of the belt is the next differentiating feature. Intralox belts are available in 0.6 in. (15.2 mm), 1 in. nominal (25.4 mm and 27.2 mm), 1.25 in. (31.8 mm), 1.5 in. (38.1 mm), 2 in. 2 in. (50.8 mm) and 2.5 in. (63.5 mm) pitches. Smaller pitch reduces chordal action (over similar size sprockets) and the space required for product transfer.

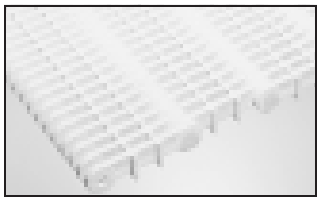
DRIVE METHOD should also be considered. There are two drive methods used by Intralox: Hinge-driven and Centre-driven. Where back tension is an important consideration, drive method plays a significant role.

NOTE: Unless otherwise noted, the belts have fully flush edges.

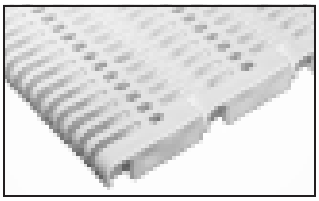
FLUSH GRID SURFACE



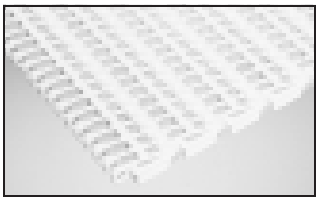
SERIES 100 • Centre-driven • Open hinge • 1 in. (25.4 mm) pitch



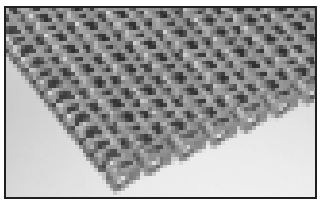
SERIES 200 • Hinge-driven • Closed hinge • 2 in. (50.8 mm) pitch • Non flush edge



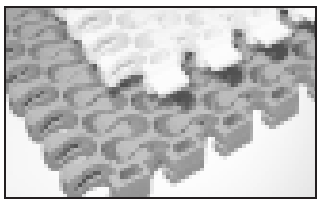
SERIES 400 • Centre-driven • Closed hinge • 2 in. (50.8 mm) pitch



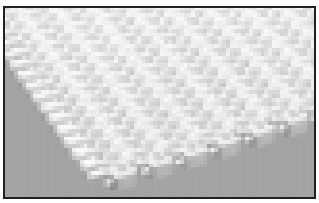
SERIES 900 • Centre-driven • Open hinge • 1.07 in. (27.2 mm) pitch



SERIES 1100 • Hinge-driven • Open hinge • 0.6 in. (15.2 mm) pitch

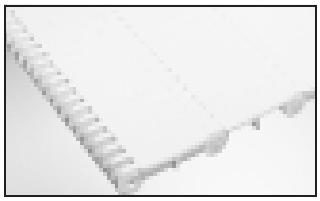


SERIES 2200 • Hinge-driven • Open hinge • Sideflexing • 1.5 in. (38.1 mm) pitch

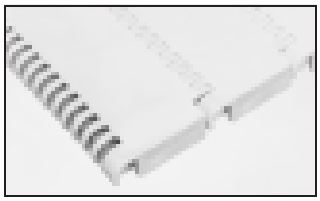


SERIES 2400 (2.2) • Hinge-driven • Open hinge • Sideflexing • 1 in. (25.4 mm) pitch

FLAT TOP SURFACE

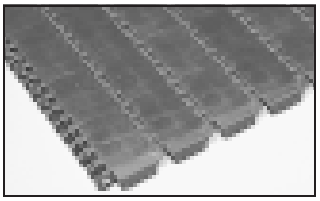


SERIES 200 • Hinge-driven • Closed hinge • 2 in. (50.8 mm) pitch



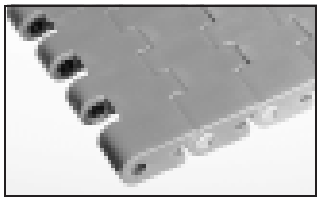
SERIES 400 • Centre-driven • Closed hinge • 2 in. (50.8 mm) pitch

SERIES 800 • Centre-driven • Open hinge • 2 in. (50.8 mm) pitch

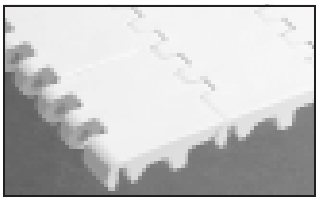


SERIES 900 • Centre-driven • Closed hinge • 1.07 in. (27.2 mm) pitch

SERIES 1100 • Hinge-driven • Open hinge • 0.6 in. (15.2 mm) pitch

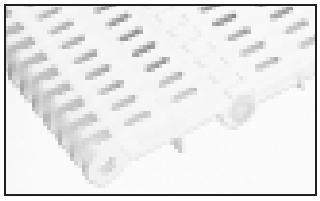


SERIES 1400 • Centre/hinge driven • Closed hinge • 1 in. (25.4 mm) pitch

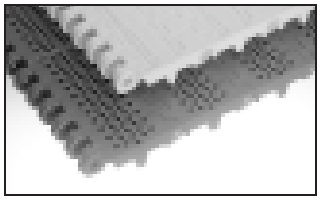


SERIES 1800 • Centre- driven • Open hinge • 2.5 in. (63.5 mm) pitch

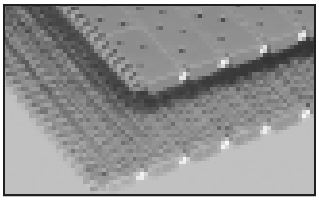
PERFORATED FLAT TOP SURFACE



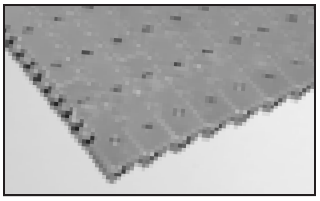
SERIES 200 • Hinge-driven • Closed hinge • 2 in. (50.8 mm) pitch



SERIES 800 • Centre-driven • Open hinge • 2 in. (50.8 mm) pitch

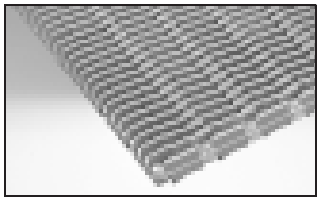


SERIES 900 • Centre-driven • Closed hinge • 1.07 in. (27.2 mm) pitch

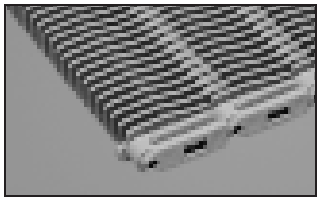


SERIES 1100 • Hinge-driven • Open hinge • 0.6 in. (15.2 mm) pitch

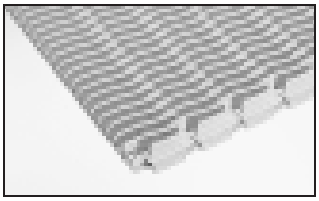
RAISED RIB SURFACE



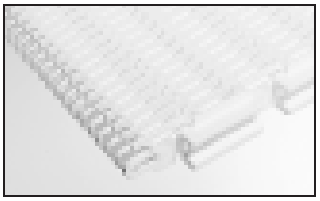
SERIES 100 • Centre-driven • Open hinge • 1 in. (25.4 mm) pitch



SERIES 400 • Centre-driven • Closed hinge • 2 in. (50.8 mm) pitch

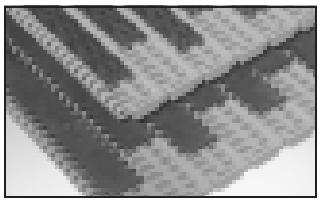


SERIES 900 • Centre-driven • Open hinge • 1.07 in. (27.2 mm) pitch

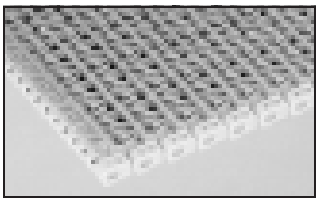


SERIES 2000 • Centre-driven • Sideflexing • 1.25 in. (31.8 mm) pitch

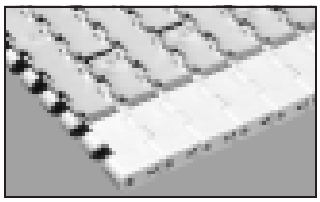
FRICTION SURFACE



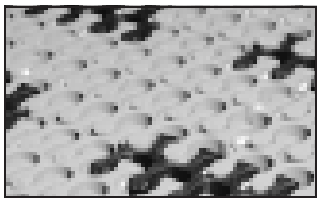
SERIES 900 DFT and FFT • Centre-driven • 1.07 in. (27.2 mm) pitch



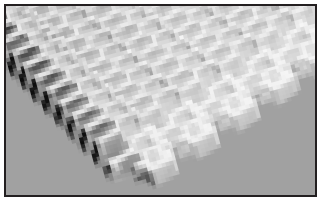
SERIES 1100 • Centre-driven • 0.6 in. (15.2 mm) pitch



SERIES 1400 • Centre-driven • 1 in. (25.4 mm) pitch

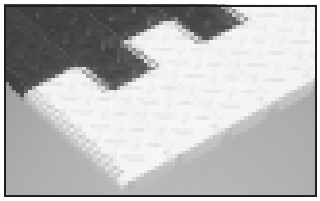


SERIES 2200 FRICTION MODULES • Hinge-driven • 1.5 in. (38.1 mm) pitch

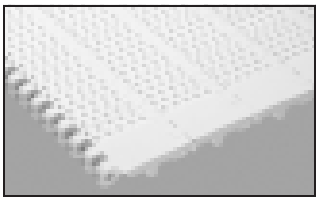


SERIES 2400 FRICTION • Hinge-driven • 1 in. (25.4 mm) pitch

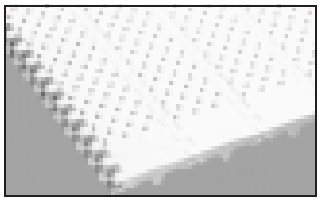
TEXTURED FLAT TOP



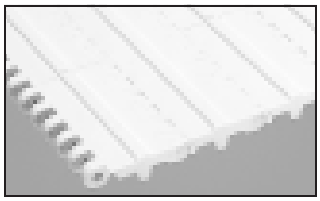
SERIES 400 NON SKID • Centre-driven • Closed hinge • 2 in. (50.8 mm) pitch



SERIES 800 NUB TOP • Centre-driven • Open hinge • 2 in. (50.8 mm) pitch

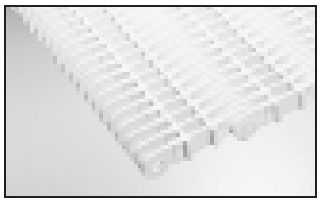


SERIES 800 CONE TOP • Centre-driven • Open hinge • 2 in. (50.8 mm) pitch

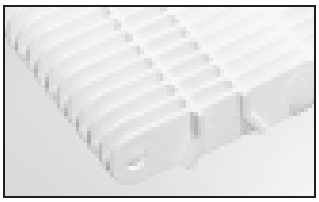


SERIES 800 MINI RIB • Centre-driven • Open hinge • 2 in. (50.8 mm) pitch

OPEN HINGE SURFACE

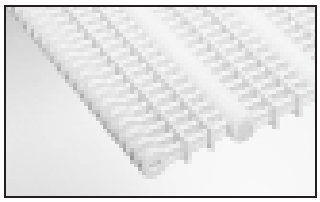


SERIES 200 • Hinge-driven • Open hinge • 2 in. (50.8 mm) pitch • Non flush edge

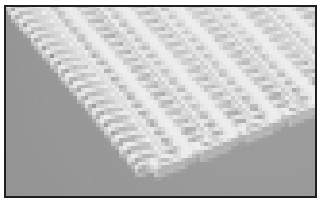


SERIES 400 • Centre-driven • Open hinge • 2 in. (50.8 mm) pitch • Non flush edge

OPEN GRID SURFACE

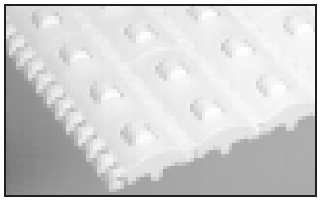


SERIES 200 • Hinge-driven • Closed hinge • 2 in. (50.8 mm) pitch • Non flush edge



SERIES 900 • Centre-driven • Open hinge • 1.07 in. (27.2 mm) pitch

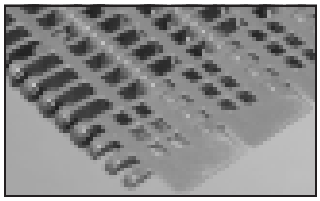
ROLLER TOP



SERIES 800 • Centre-driven • Open hinge • 2 in. (50.8 mm) pitch

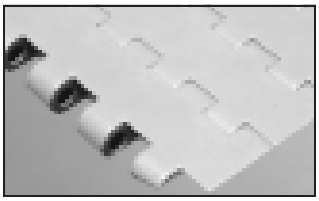
CHAIN PRODUCTS*

ONEPIECE™ LIVE TRANSFER



SERIES 900 Flush Grid • Centre-driven • Open hinge • 1.07 in. (27.2 mm) pitch • Available widths: 4.7 in. (119.4 mm) and 6 in. (152.4 mm)

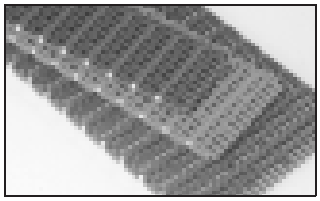
SERIES 900 Flat Top • Centre-driven • Closed hinge • 1.07 in. (27.2 mm) pitch • Available widths: 4.7 in. (119.4 mm) and 6 in. (152.4 mm)



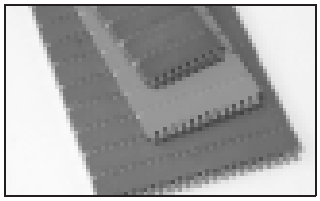
SERIES 1400 Flat Top • Centre/hinge driven • Closed hinge • 1 in. (25.4 mm) pitch • Available width: 6 in. (152.4 mm)

NOTE: Series 900 Live Transfer edges are also available with bricklayed belts. For more information, see the data pages in Section 2 or contact Intralox Customer Service.

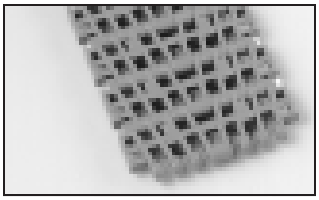
MOULD TO WIDTH



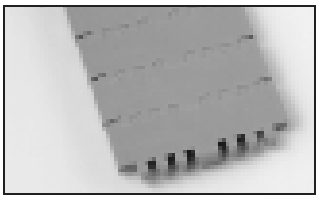
SERIES 900 Flush Grid • Centre-driven • Open hinge • 1.07 in. (27.2 mm) pitch • Available widths: 3.25 in. (82.6 mm), 4.5 in. (114.3 mm) and 7.5 in. (190.5 mm)



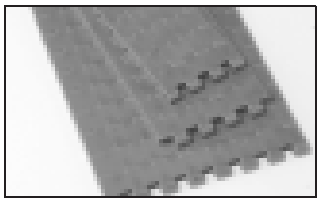
SERIES 900 Flat Top • Centre-driven • Closed hinge • 1.07 in. (27.2 mm) pitch • Available widths: 3.25 in. (82.6 mm), 4.5 in. (114.3 mm) and 7.5 in. (190.5 mm)



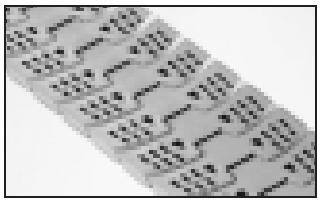
SERIES 900 Flush Grid (85 mm) • Centre- driven • Open hinge • 1.07 in. (27.2 mm) pitch • Available widths: 85 mm



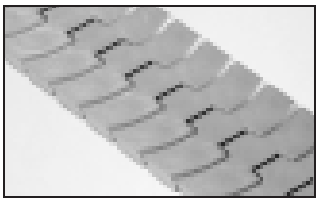
SERIES 900 Flat Top (85 mm) • Centre-driven • Closed hinge • 1.07 in. (27.2 mm) pitch • Available widths: 85 mm



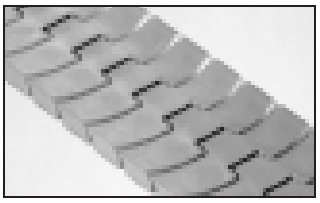
SERIES 1400 Flat Top • Centre/hinge driven • Closed hinge • 1 in. (25.4 mm) pitch • Available widths: 3.25 in. (82.6 mm), 4.5 in. (114 mm) and 7.5 in. (190.5 mm)



SERIES 4009 Flush Grid • Hinge driven • Closed hinge • 1 in. (25.4 mm) pitch • Available widths: 83.8 mm (for parallel running at 85 mm).



SERIES 4009 Flat Top • Hinge driven • Closed hinge • 1 in. (25.4 mm) pitch • Available widths: 83.8 mm (for parallel running at 85 mm).



SERIES 4014 Flat Top • Hinge driven • Closed hinge • 1 in. (25.4 mm) pitch • Available widths: 83.8 mm (for parallel running at 85 mm).

* Intralox offers belt styles in dedicated width chains. These chain products come in industry standard widths, and are available in 10 foot (3.05 m) increments.

KNUCKLE CHAIN

SERIES 3000 • Centre-driven • Closed hinge • 2 in. (50.8 mm) pitch • Turning and straight running. Available width 57 mm (excluding tabs)

NOTE: NEVER CALCULATE THE WIDTH OF A BRICKLAID BELT BASED ON INCREMENT STATEMENTS IN THIS MANUAL. DEPENDING ON THE BELT MATERIAL, THE BELT PITCH AND THE BELT WIDTH MAY VARY CONSIDERABLY. PLEASE CONTACT **INTRALOX** FOR ACCURATE DIMENSIONS.

STEP FOUR: Select a belt of sufficient **strength** for your application.

After choosing the material and surface style to meet your needs, next determine if the belt selected is strong enough to meet your application requirements.

Analysis for straight running belts:

After making a tentative selection from the Series and Styles listed above, turn to the **Belt Selection Instructions** in Section Two, **Product Line**, for instructions to determine the **Belt Pull** and **Adjusted Belt Pull** for comparison with the **Allowable Strength** for that belt. In order to make the necessary calculations for **Belt Pull**, gather this information:

1. the product weight applied to the belt, in pounds per square foot (or kilograms per square meter),
2. the length of the proposed conveyor, in feet (or meters),
3. any elevation changes in the conveyor, in feet (or meters),
4. the desired operating speed, in feet per minute (or meters per minute),
5. the percent of belt area "backed-up" with stationary product,
6. the *maximum* operating temperature to be experienced by the belt, in degrees Fahrenheit (or degrees Celsius),
7. the type of material upon which the belt will run in the conveyor frame, e.g. Stainless or Carbon Steel, Ultra High Molecular Weight Polyethylene (UHMW), High Density Polyethylene (HDPE), nylon, etc., and
8. the **Service Duty**, i.e. frequent start-ups under heavy load, an elevating or "pushing conveyor", etc.

Analysis for sideflexing belts:

These belts require a more complex analysis. The following additional information is required:

9. the length of each straight run,
10. the turning angle and direction of each turn, and
11. the inside turning radius, measured from the inside edge of the belt.

STEP FIVE: Other important considerations.

The following factors should be considered before proceeding any further with belt selection.

BELT SPEED

The belt speed affects the wear and life expectancy in these ways:

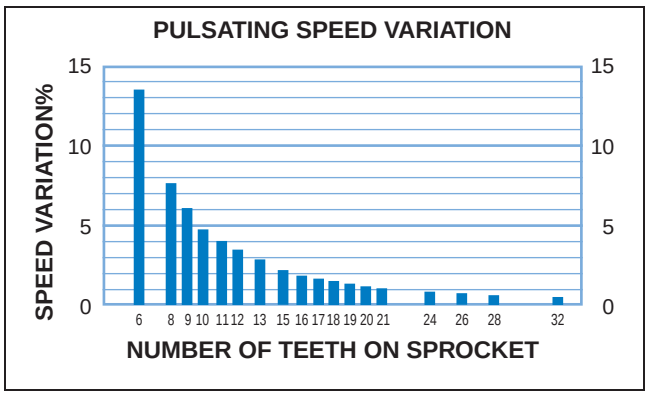
1. **Hinge and sprocket wear:** The frequency of module rotation about the hinge rods (as the belt engages and disengages the sprockets) is directly proportional to speed. The rotary motion can cause wear to both rods and modules. This wear rate, however, is inversely proportional to the belt's length, i.e., a shorter conveyor should wear faster than a longer one if both are running at the same speed. It follows that sprocket/tooth wear is directly proportional to speed. Sprockets with more teeth cause less module/hinge rotation, consequently less wear than sprockets with fewer teeth.
2. **Belt surface wear:** As belts slide over carryways, returnways, shoes and other fixed members, some wear is to be expected. The most destructive conditions are high speed, heavy loads, abrasive materials, and dry or non lubricated operation.
3. **Dynamic effects of high speed operation:** Two effects of high speed conditions are belt "whipping" or oscillating in unsupported sections and "load surges" as heavy, stationary products are suddenly accelerated to belt speed. Where possible, both conditions should be avoided.

ABRASIVE CONDITIONS AND FRICTION EFFECTS

Abrasives in a conveying application must be identified, the best combination of materials chosen and protective features included in order to extend belt life. Abrasives will wear away any material, but the correct material choice can significantly increase belt life. In highly abrasive applications, the hinge rods and sprockets are usually the first elements to be affected. Hinge rod wear typically results in excessive belt-pitch elongation. This may prevent proper tooth engagement, increasing the wear on sprocket teeth. Intralox offers Stainless Steel split sprockets and Abrasion Resistant rods that work to increase belt life.

CHORDAL ACTION AND SPROCKET SELECTION

As the modules of belts engage their driving sprockets, a pulsation in the belt's linear velocity occurs. This is due to chordal action, which is the rise and fall of a module as it rotates around a shaft's centre line. It is characteristic of all sprocket-driven belts and chains. The variation in speed is inversely proportional to the number of teeth on the sprocket. For example, a belt driven by a six tooth sprocket has a pulsating speed variation of 13.4%, while a belt driven by a 19 tooth sprocket has a variation of only 1.36%. In those applications, where product tipping is a concern, or where smooth, even speed is critical, it is recommended that sprockets with the maximum number of teeth available be selected.

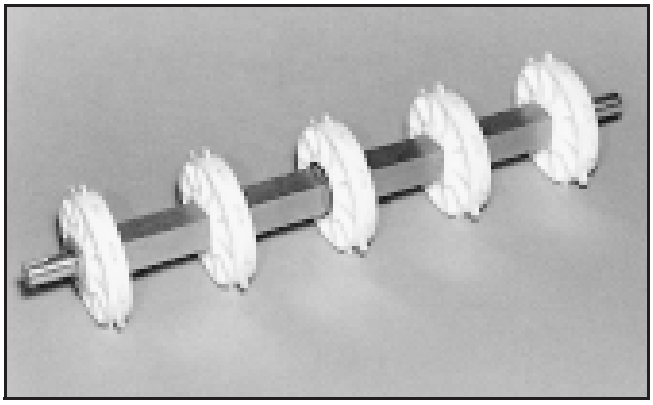


SHAFTS

Intralox Inc. USA can supply square shafts, machined to your specification, in standard sizes of 5/8 in., 1 in., 1.5 in., 2.5 in., and 3.5 in. Available materials are Carbon Steel (C-1018), Stainless Steel (303, 304 and 316) and Aluminium (6061-T6). Call Customer Service for availability and lead-times.

Intralox Inc. Europe offers square shafts in standard sizes of 25 mm, 40 mm and 60 mm. Available materials are Carbon Steel (KG-37) and Stainless Steel (304).

Square shafts need turning of bearing journals only. No keyways for sprockets are required. *Only one sprocket per*



shaft must be retained to prevent lateral belt movement and to provide positive tracking. This is usually done by placing retainer rings on opposite sides of the centre sprocket. Standard rings rest in grooves cut into the four corners of the shaft. Self-set retainer rings and small bore round retainer rings are available which do not require grooves.

SHAFT STRENGTH

The two primary concerns regarding the strength of the conveyor drive shafts are 1) the ability to pull the belt without excessive shaft deflection, and 2) the strength to transmit the torque for driving the belt. In the first case, the shaft acts as a beam, supported by bearings and stressed by the belt's tension through the sprockets. In the second case, the shaft is being rotated by the drive motor. Resistance from the belt's tension introduces torsional (twisting) stresses. These two types of stresses, **maximum deflection** and **maximum allowable torque**, are analysed separately. Simple formulas are provided for selecting appropriate shafts.

Maximum deflection is governed by adequate belt and sprocket tooth engagement. If the shaft deflects more than 0.10 in. (2.5 mm) the sprockets may not engage properly, resulting in "jumping". On bi-directional conveyors with centre-drive, the limit is increased to 0.22 in. (5.6 mm) because the return side tension is greater and the tooth loading is more uniformly distributed.

WEARSTRIPS

Wearstrips are added to a conveyor frame to increase the useful life of the conveyor frame and belt, and to reduce the sliding friction forces. Proper choice of wearstrip design and material, yielding the best coefficient of friction, reduces belt and frame wear, and power requirements.

Any clean liquid, such as oil or water, will act as a coolant and as a separation film between the belt and the carryway, usually reducing the coefficient of friction. Abrasives such as salt, broken glass, soil and vegetable fibres will embed in softer materials and wear on harder materials. In such applications harder wearstrips will prolong belt life.

STATIC ELECTRICITY

Plastic belting may produce a static discharge or spark when used in a dry environment. If static electricity is a potential problem in your application, electrical grounding is recommended. Lubricating or adding moisture to the conveyor running surfaces is also recommended. Electrically Conductive Acetal is available in some belt styles. Contact the Intralox Sales Engineering Department for additional recommendations.

INTRALOX SERVICES

ENGINEERING ASSISTANCE AND DESIGN REVIEW • To obtain engineering assistance, or to request a design review, call the Intralox Sales Engineering Department.*

ENGINEERING ANALYSIS COMPUTER PROGRAMS • Intralox offers a PC based Engineering Program for all belts used in straight running applications that will calculate belt pull, sprocket requirements, motor and drive information, etc. Call Customer Service* to request these programs.

CAD DRAWING FILES • .DXF and.DWG templates for all Series are also available. The templates have belt and moulded sprocket details which can be used in CAD conveyor designs. Call Customer Service* for more information.

PRODUCT LITERATURE • Intralox offers additional technical and application specific literature on most of the products listed in this manual. Call Customer Service* for more information.

WORLD WIDE WEB • For information on Intralox products, our company or to download the Intralox® Engineering Program, visit the Intralox web site at ***http://www.intralox.com***.

*See back cover for international listings

TABLE OF CONTENTS

Page #

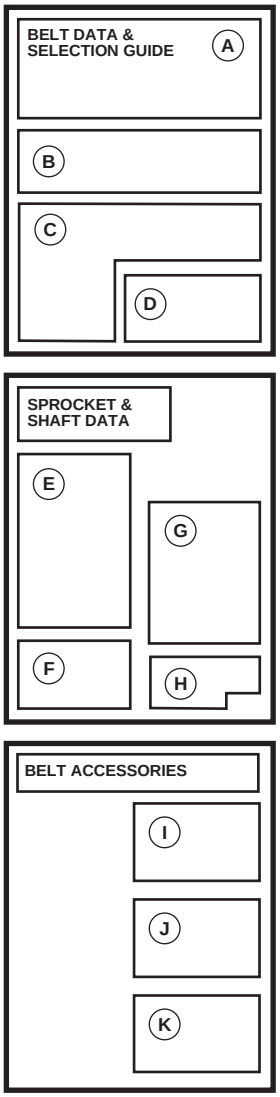
HOW TO USE THIS SECTION 2-1
INTRALOX MATERIALS 2-2
AVAILABILITY TABLE 2-4
BELT SELECTION INSTRUCTIONS 2-7

STRAIGHT RUNNING BELTS
Series 100 2-9
Series 200 2-15
Series 400 2-23
Series 800 2-33
Series 900 2-45
Series 1100 2-61
Series 1400 2-69
Series 1800 2-75
Series 3000 Knuckle Chain (Straight) 2-89

Page #

SIDEFLEXING BELTS
Intraflex™ 2000 2-77
Series 2200 2-81
Series 2400 2-85
Series 3000 Knuckle Chain (Turning) 2-89
Series 4000 2-91

SHAFTS 2-95
RETAINER RINGS 2-96
SCROLL IDLERS 2-97
WEARSTRIPS 2-98
CUSTOM WEARSTRIPS 2-99
PUSHER BARS 2-100
HOLD DOWN ROLLERS 2-101
ABRASION RESISTANCE SYSTEM 2-102
ABRASION RESISTANCE HINGE RODS 2-103



HOW TO USE THIS SECTION

This section of the manual contains descriptive information and data for all belt styles, sprockets and other accessories in the Intralox Product Line.

BELT DATA

There are 47 of these pages, at least one for each belt style.

(A) **Belt Description —** principal characteristics, dimensions and photographs.

(B) **Data —** strengths, weights, temperature ranges of belts in the materials in which they are manufactured.

(C) **Operating Factors —** for adjusting ideal operating conditions to actual operating conditions. Friction coefficients of each material versus various wear surfaces and types of products.

(D) **Product Notes —** series and style specific information.

SPROCKET & SHAFT DATA

These pages follow the belt data pages in each series.

(E) **Sprocket and Support Table —** for determining the minimum number of sprockets and wearstrips required.

(F) **Sprocket Spacing Chart —** for determining maximum spacing of sprockets on drive shaft.

(G) **Sprocket Data —** available sprockets and dimensions.

(H) **Shaft Data —** available shaft sizes and materials, unit weights. Data for shaft deflection and stress calculations. In series with split sprockets, split sprocket data and shaft data are found on a separate page.

BELT ACCESSORIES

These pages are found at the end of most sections. (**Series 1400** has no accessories. In series with large accessory lines, there are two pages.)

(I) **Flights —** description, availability for each series.

(J) **Sideguards —** description, availability for each series.

(K) **Finger Transfer Plates —** description, availability for each series (Raised Rib belt styles only).

STANDARD BELT MATERIALS

POLYPROPYLENE is a standard material for use in general applications and where chemical resistance may be required.

- Good balance between moderate strength and lightweight.
- Buoyant in water, with a specific gravity of 0.90.
- Polypropylene's temperature range is 34 °F (1 °C) to 220 °F (104 °C).
- A relatively strong material in normal use, polypropylene exhibits a somewhat brittle quality at low temperatures. It is not recommended in high impact conditions below 45 °F (7 °C).
- Polypropylene has good chemical resistance to many acids, bases, salts and alcohols.
- Black polypropylene is recommended for applications exposed to direct sunlight, and a specially formulated UV resistant black polypropylene is also available for applications that require even more UV protection. The UV resistant black PP is not FDA approved, and is currently available in **S1100 FG**, **S900 FG**, and **S900 PFT**.
- This material complies with FDA regulations for use in food processing and packaging applications.

POLYETHYLENE, another lightweight thermoplastic, is characterized by superior flexibility and high impact strength.

- Buoyant in water, with a specific gravity of 0.95.
- Excellent product release characteristics.
- Polyethylene exhibits excellent performance at much lower temperatures.
- Polyethylene's temperature range is -100 °F (-73 °C) to 150 °F (66 °C). (Check belt specifications for exact figures).
- Polyethylene is resistant to many acids, bases and hydrocarbons.
- Black polyethylene is recommended for low temperature applications exposed to direct sunlight.
- This material complies with FDA regulations for use in food processing and packaging applications.

ACETAL thermoplastics are considerably stronger than polypropylene and polyethylene, and have a good balance of mechanical, thermal and chemical properties.

- Acetal has good fatigue endurance and resilience.
- Low coefficient of friction, making it a good choice for container handling and transport.
- Acetal's temperature range is -50 °F (-46 °C) to 200 °F (93 °C).
- Its specific gravity is 1.40.
- Relatively impact resistant.
- Acetal belts are fairly hard, so they are relatively cut and scratch resistant.
- This material complies with FDA regulations for use in food processing and packaging applications.

EC (Electrically Conductive) ACETAL can be used to help dissipate static charges that might build up, especially when moving cans or other conductive objects. A metal railing or carryway can be used to ground the belt, dissipating any charge built up in the product. EC Acetal is usually spliced into "normal" belt sections (three rows of EC Acetal for every 2 ft. (0.61 m) of belt for **Series 100** and **Series 900**, five rows for every 2 ft. (0.61 m) of belt for **Series 1100**), though entire belts can be made from EC Acetal.

SERIES 900 FLUSH GRID IN ACETAL WITH EC ACETAL SECTIONS

- The chemical resistance and friction factors match those of regular acetal.
- EC Acetal has a resistance of 60,000 Ohms per square, compared to a resistance of several million Ohms per square in regular plastics.
- Its specific gravity is 1.40.
- This material is not FDA compliant.
- EC Acetal is only available in **Series 100 Flush Grid**, **Series 400 Flush Grid** and **Flat Top, Series 900 Flush Grid**, **Flat Top** and **Raised Rib**, and **Series 1100 Flush Grid** belt styles.

SPECIAL APPLICATION BELT MATERIALS

FLAME RETARDANT THERMOPLASTIC POLYESTER (FR-TPES) material is V-0 rated (UL94 @ 1/32"), and will not sustain a flame. Though the material will not actively burn, it will blacken and melt in the presence of flame. FR-TPES is stronger than polypropylene, but not as strong as acetal.

- V-0 rated (UL94 @ 1/32").
- FR-TPES' temperature range is 40 °F (7 °C) to 180 °F (82 °C).
- FR-TPES has a specific gravity of 1.45.
- This material is not FDA compliant.
- FR-TPES is available in **Series 1100 Flush Grid**, **Series 900 Flush Grid**, **Series 900 Flush Grid ONEPIECE™ Live Transfer** and **Series 900 Perforated Flat Top**.

IMPACT RESISTANT NYLON (IR) is available only in **Series 800 Flat Top**. This material is designed for the meat fabrication industry and is very resistant to impact. The two limitations to IR Nylon are that it absorbs water and is more susceptible to cuts and gouges than acetal. Because of material expansion caused by water absorption, IR Nylon is not recommended for very wet applications. For example, at 100% relative humidity, the expansion will be close to 3% (at equilibrium), making a 24 in. (610 mm) wide belt expand to 24.75 in. (629 mm).

- Good chemical resistance and low temperature performance.
- Stronger than polypropylene.
- IR Nylon's temperature range is -50 °F (-46 °C) to 180 °F (82 °C).
- Good fatigue resistance.
- IR Nylon has a specific gravity of 1.13.
- This material, only available in **Series 800 Flat Top**, complies with FDA regulations for use in food processing and packaging applications.

HEAT RESISTANT NYLON (HR), is available in two grades: FDA compliant, and non FDA compliant. The FDA HR Nylon complies with FDA regulations for use in food processing and packaging applications.

- UL94 flammability rating of V-2.
- FDA HR Nylon has an upper, continuous temperature limit of 240 °F (116 °C). For intermittent exposure, FDA HR Nylon has a rating limit of 270 °F (132 °C).
- Non FDA HR Nylon has an upper, continuous temperature limit of 310 °F (154 °C). For intermittent exposure, non FDA HR Nylon is rated at 360 °F (182 °C).
- The specific gravity of both grades is 1.13.
- These materials will absorb water in wet environments, causing the belt to expand. The belt will also expand due to the temperature change. The thermal expansion coefficient is 0.00054 in/ft/°F (0.081 mm/m/°C).
- Both FDA HR Nylon and non FDA HR Nylon are available in **Series 900 Flush Grid**, **Raised Rib**, **Flat Top and Perforated Flat Top** styles for dry, elevated temperature applications. **Series 1100 Flush Grid** is available with non FDA HR nylon.

BELT MATERIAL PROPERTIES

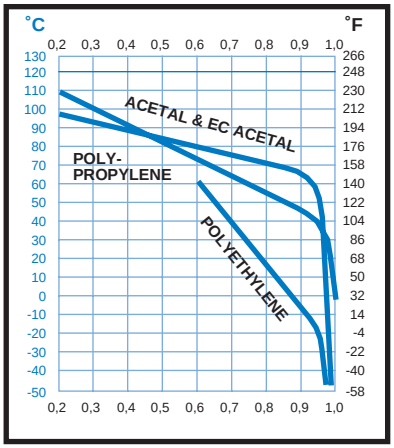
SPECIFIC GRAVITY is the ratio of the materials' density to the density of water at normal pressures and temperatures. A specific gravity greater than 1.0 indicates that the material is heavier than water, and a specific gravity less than 1.0 indicates the material will be buoyant in water.

MATERIAL	SPECIFIC GRAVITY
Polypropylene	0.90
Polyethylene	0.95
Acetal	1.40
EC Acetal	1.40
FR-TPES	1.45
IR Nylon	1.13
HR Nylon (both grades)	1.13

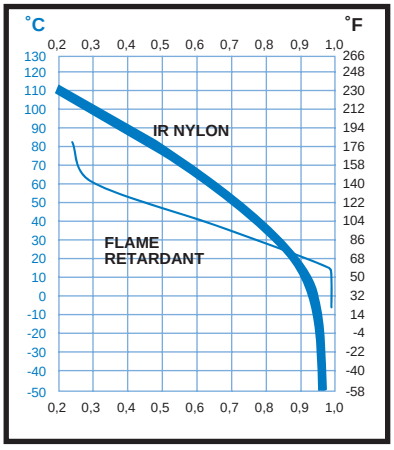
FRICTION FACTORS determine the amount of drag induced from the belt sliding on the conveyor frame or sliding under the conveyed product. Lower friction factors lead to lower line pressures, less product marring, and lower belt pull and power requirements. Sometimes higher friction is required for gradual inclines/declines or for higher line pressures for feeding other equipment. The friction factors generally refer to "clean" systems, with little wear or abrasive material present. When running a conveyor belt strength analysis (either by using the Intralox Engineering Program or by using the hand calculations outlined on pages 2-7 to 2-8), normal practice would dictate using a higher friction factor than normal if any abrasive medium is present, such as flour, sand, cardboard dust, etc. Under very dirty conditions, friction factors may be two to three times higher than under clean conditions.

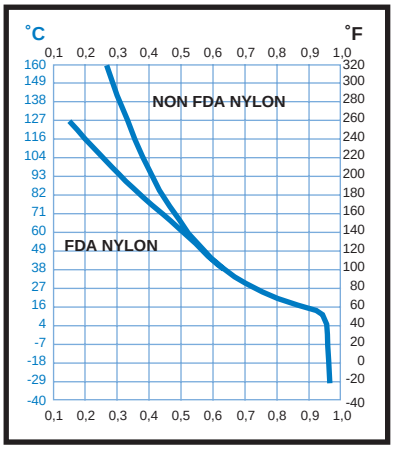
TEMPERATURE has an affect on the physical properties of thermoplastic materials. Generally, as the operating temperature increases, the belt will weaken in strength, but become tougher and more impact resistant. Conversely, in colder applications, belts can become stiffer and in some cases brittle. The temperature factor curve shows the effect of temperature on belt strength, and this graph can be used in calculating the conveyor belt analysis by hand. The Intralox Engineering Program calculates the temperature factor automatically, based on the operating temperature of the application.

TEMPERATURE FACTOR TABLES STANDARD MATERIALS



SPECIAL APPLICATION MATERIALS





BELT STYLE AND MATERIAL AVAILABILITY

The chart below lists the available materials for each belt style. It should be noted that not all combinations of styles and materials are inventory items. Not all styles and material combinations are USDA accepted (Meat and Poultry, or Dairy). For USDA acceptance, both the belt style and the material must be approved. As an example, **Series 900 Flush Grid** in polypropylene is USDA accepted for direct food contact, but **Series 900 Flush Grid** in EC Acetal (not a FDA accepted material) is not USDA accepted.

All Intralox belting products and accessories can be classified either as stock items or as mould-to-order items. Some mould-to-order items may incur special set-up charges. **Call Customer Service for pricing, lead-times and availability.**		Belt specification		Agency Acceptability			Standard materials				Special application materials				Accessories			
		Nominal Pitch, in. (mm)	**% Open Area**	**USDA accepted (Meat and Poultry) Design**	**USDA Dairy Accepted Design***	**International Approvals** (See key below)	**Polypropylene** (FDA, USDA, USDA Dairy - *White Only*)	**Polyethylene** (FDA, USDA, USDA Dairy - *Natural Only*)	**Acetal** (FDA, USDA, USDA Dairy - *White Only*)	**EC Acetal**	**Flame Retardant Material**	**Impact Resistant Nylon** (FDA, USDA)	**Heat Resistant Nylon** (FDA compliant)	**Heat Resistant Nylon** (Non FDA compliant)	**Flights**	**Sideguards**	**Finger Transfer Plates**	**Friction Modules**
STRAIGHT RUNNING BELTS																		
SERIES 100	**FLUSH GRID**	1.0 (25.4)	**•31**	•		C	•	•	•	•					•	•		
	RAISED RIB	1.0 (25.4)	**31**	•		C	•	•	•								•	
SERIES 200	**OPEN HINGE**	2.0 (50.8)	**45**	•	•	C	•	•							•	•		
	OPEN GRID	2.0 (50.8)	**33**				•	•							•	•		
	FLUSH GRID	2.0 (50.8)	**33**				•	•							•	•		
	FLAT TOP	2.0 (50.8)	**0**				•	•							•	•		
	PERFORATED FLAT TOP	2.0 (50.8)	**12**				•	•							•	•		
SERIES 400	**FLUSH GRID**	2.0 (50.8)	**17**				•	•	•	•					•	•		
	RAISED RIB	2.0 (50.8)	**26**				•	•									•	
	OPEN HINGE	2.0 (50.8)	**30**	•		C	•	•							•	•		
	FLAT TOP	2.0 (50.8)	**0**				•	•	•	•					•	•		
	NON SKID	2.0 (50.8)	**0**							•					•			
SERIES 800	**FLAT TOP**	2.0 (50.8)	**0**	**C**	•	A,C,Z,M	•	•	•			•			•	•		
	PERFORATED FLAT TOP	2.0 (50.8)	**18**	•			•	•	•						•	•		
	PERFORATED FLAT TOP 5/32"	2.0 (50.8)	**20**	•		M	•	•							•	•		
	MINI RIB	2.0 (50.8)	**0**	•		A,C,Z	•	•	•									
	NUB TOP	2.0 (50.8)	**0**				•	•	•						•	•		
	CONE TOP	2.0 (50.8)	**0**				•	•	•						•	•		
	ROLLER TOP	2.0 (50.8)	**0**				•	•	•									
SERIES 900	**OPEN GRID**	1.07 (27.2)	**38**	•		C	•	•	•									
	FLUSH GRID	1.07 (27.2)	**38**	•		C,M	•	•	•	•	•		•	•	•	•		
	RAISED RIB	1.07 (27.2)	**38**	•		C	•	•	•	•			•	•			•	
	FLAT TOP	1.07 (27.2)	**0**				•	•	•				•	•	•	•		
	PERFORATED FLAT TOP ∅ 1/8"	1.07 (27.2)	**5.1**						•						•	•		
	PERFORATED FLAT TOP ∅ 5/32"	1.07 (27.2)	**6.4**				•	•	•		•		•	•	•	•		
	PERFORATED FLAT TOP ∅ 3/16"	1.07 (27.2)	**7.9**						•		•				•	•		
	MESH TOP	1.07 (27.2)	**24**				•	•	•						•	•		
	DIAMOND FRICTION TOP	1.07 (27.2)	**—**				•**	•**										•**
	FLAT FRICTION TOP	1.07 (27.2)	**—**				•**											•**
SERIES 1100	**FLUSH GRID**	0.6 (15.2)	**28**	•	•	C,M	•	•	•	•	•			•	•	•		
	FLAT TOP	0.6 (15.2)	**0**	•	•	M	•	•	•						•	•		
	PERFORATED FLAT TOP	0.6 (15.2)	**3.2**						•									
	FLUSH GRID FRICTION TOP	0.6 (15.2)	**0**				•											•
SERIES 1400	**FLAT TOP**	1.0 (25.4)	**0**				•		•									
	FLAT FRICTION TOP	1.0 (25.4)	**0**				•											•
SERIES 1800	**FLAT TOP**	2.5 (63.5)	**0**	***	***		•	•	•						•			
SERIES 3000	**KNUCKLE CHAIN (STRAIGHT)**	2.0 (50.8)	**- -**	•					•									

All Intralox belting products and accessories can be classified either as stock items or as mould-to-order items. Some mould-to-order items may incur special set-up charges. Call Customer Service for pricing, lead-times and availability.	Belt specification		Agency Acceptability			Standard materials				Special application materials				Accessories			
	Nominal Pitch, in. (mm)	% Open Area	USDA accepted (Meat and Poultry) Design	USDA Dairy Accepted Design*	International Approvals (See key below)	Polypropylene (FDA, USDA, USDA Dairy - *White Only*)	Polyethylene (FDA, USDA, USDA Dairy - *Natural Only*)	Acetal (FDA, USDA, USDA Dairy - *White Only*)	EC Acetal	Flame Retardant Material	Impact Resistant Nylon (FDA, USDA)	Heat Resistant Nylon (FDA compliant)	Heat Resistant Nylon (Non FDA compliant)	Flights	Sideguards	Finger Transfer Plates	Friction Modules
SIDEFLEXING BELTS																	
SERIES 2000 RAISED RIB	1.25 (31.8)	18	•		C	•	•	•								•	
SERIES 2200 FLUSH GRID	1.5 (38.1)	50	•	•	C,M	•	•	•						•			•**
SERIES 2400 FLUSH GRID	1.0 (25.4)	42	***	***		•	•	•									
SERIES 3000 KNUCKLE CHAIN (TURNING)	2.0 (50.8)	--	•					•									
SERIES 4000																	
S4009 FLUSH GRID	1.0 (25.4)	13						•									
S4009 FLAT TOP	1.0 (25.4)	0						•									
S4014 FLAT TOP	1.0 (25.4)	0						•									

* USDA Dairy accepted designs require the use of a clean-in-place system

** The black, high friction material used for Intralox Series 900 Diamond Friction Top, Series 900 Flat Friction Top and the friction inserts for Series 2200 is not FDA compliant. The white friction material is FDA compliant.

*** Prior to Intralox's development of Series 1800 and Series 2400, USDA discontinued publishing a list of acceptable new products designed for food contact. As of the printing of this literature, third party approvals are being investigated, but are not yet sanctioned by the USDA.

Key to International Agencies:

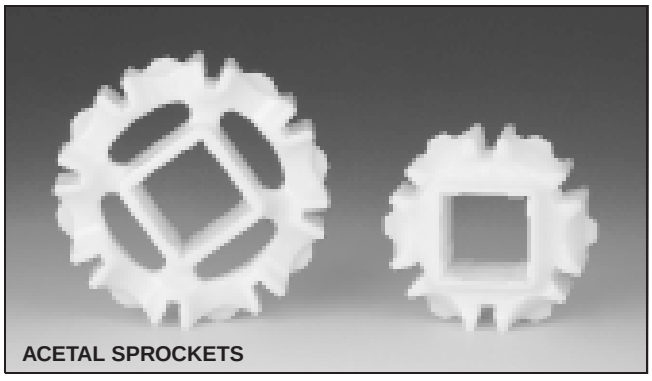
A – Australian Quarantine Inspection Service
C – Agriculture Canada, Food Production and Inspection Branch
M – MAF Quality Management - Australian Dairy
Z – New Zealand Ministry of Agriculture and Fisheries

AGENCY COMPLIANCE BY MATERIAL	
FDA	Polypropylene, Polyethylene, Acetal, HR Nylon (FDA grade only), IR Nylon
USDA (Meat and Poultry)	Polypropylene, Polyethylene, Acetal, IR Nylon
USDA Dairy	**Polypropylene (white), Polyethylene (natural), Acetal (white)**

GENERAL APPLICATION SPROCKET MATERIAL

ACETAL sprockets are used for most general purpose applications. This material is considerably stronger than polypropylene and polyurethane, and has a good balance of mechanical, thermal and chemical properties.

- Acetal has good fatigue endurance and resilience.
- Acetal's temperature range is -50 °F (-46 °C) to 200 °F (93 °C).
- This material is FDA compliant for use in food processing and packaging applications.



ACETAL SPROCKETS

SPECIAL APPLICATION SPROCKET MATERIAL

POLYPROPYLENE sprockets are used for applications where chemical resistance may be required.

- Polypropylene has good chemical resistance to many acids, bases, salts and alcohols.
- Polypropylene temperature range is 34 °F (1 °C) to 220 °F (104 °C).
- A relatively strong material in normal use, polypropylene exhibits a somewhat brittle quality at low temperatures. It is not recommended in high impact conditions below 45 °F (7 °C).
- This material is FDA compliant for use in food processing and packaging applications.
- Contact Intralox Customer Service for polypropylene sprocket availability.

POLYURETHANE sprockets are used for applications where abrasive wear is common.

- Polyurethane's temperature range is 0 °F (-18 °C) to 120 °F (49 °C). Polyurethane becomes soft and flexible at high temperatures.
- **Series 800** has a lower rating when using polyurethane sprockets. Refer to the **Series 800** data pages for these ratings.

- Polyurethane sprockets are only available in **Series 100, 200, 400** and **800**. Contact Intralox Customer Service for availability.

STAINLESS STEEL split sprockets are used for applications with abrasive wear or when shaft removal is not practical. There are two types of stainless steel sprockets. The all-metal Abrasion Resistant sprockets are available in a number of Series and Pitch Diameters. The Stainless Steel Split consists of 1 to 3 stainless steel tooth plates assembled between polypropylene joining plates.

- The sprocket is split into two pieces for easy assembly onto and off of a shaft.
- Stainless steel split sprockets have good chemical resistance.
- Polypropylene's temperature range is 34 °F (1 °C) to 220 °F (104 °C).
- A relatively strong material in normal use, polypropylene exhibits a somewhat brittle quality at low temperatures. It is not recommended in high impact conditions below 45 °F (7 °C).
- These materials are FDA compliant for use in food processing and packaging applications.
- These sprockets are built standard with 304 stainless steel plates and can be specially ordered with 316 stainless steel plates.
- Contact Intralox Customer Service for availability.

GLASS FILLED NYLON sprockets are only available for **Series 1400/4000** Split Round Bore sprockets. This material resists the abrasive environments found in harsh, glass applications.

STAINLESS STEEL SPLIT SPROCKETS

POLYETHYLENE sprockets are only available for the **Series 3000** sprockets.

NOTE: Not all sprocket pitch diameters, bore sizes and material combinations are available in all series. Those that are available can either be stocked or made to order. Contact Intralox Customer Service for availability and lead-times (some available combinations may be long lead-time items).

SPROCKET MATERIAL AVAILABILITY

The chart below lists the materials available for each Intralox sprocket by Series and Pitch Diameter. It should be noted that not all sprockets of each pitch diameter are available in all listed materials. A material which is available for certain bore types and/or bore sizes may not be available for other bore types and/or bore sizes of the same Series and Pitch Diameter sprocket. Sprockets can be either stocked or made to order, and may have long lead-times. Lead-times vary by sprocket. Some make to order sprockets may also have set up charges. Contact Intralox Customer Service for specific lead-times and availability.

All Intralox sprockets can be classified either as stock items or as make to order items. Some make to order items may incur special set-up charges. Call Customer Service for pricing, lead-times and availability.		GENERAL PURPOSE MATERIALS		SPECIAL APPLICATIONS MATERIALS					
		Acetal	Split Acetal	Polypro-pylene	Split Metal	Abrasion Resistant Metal	Poly-urethane	Split Glass Filled Nylon	Polyethyl-ene
PITCH DIAMETER in (mm)	NO. TEETH								
SERIES 100									
2.0 (51)	6	•		•					
3.5 (89)	11	•		•	•		•		
6.1 (155)	19	•		•	•		•		
SERIES 200									
4.0 (102)	6	•		•			•		
6.4 (163)	10	•		•		•	•		
10.1 (257)	16	•		•		•			
SERIES 400									
4.0 (102)	6	•		•	•		•		
5.2 (132)	8	•		•	•				
5.8 (147)	9				•*				
6.4 (163)	10	•		•	•	•			
7.8 (198)	12	•		•	•	•			
8.4 (213)	13				•*				
10.1 (257)	16	•		•	•	•			
SERIES 800									
4.0 (102)	6	•		•			•		

All Intralox sprockets can be classified either as stock items or as make to order items. Some make to order items may incur special set-up charges. Call Customer Service for pricing, lead-times and availability.		GENERAL PURPOSE MATERIALS		SPECIAL APPLICATIONS MATERIALS					
		Acetal	Split Acetal	Polypro-pylene	Split Metal	Abrasion Resistant Metal	Poly-urethane	Split Glass Filled Nylon	Polyethyl-ene
PITCH DIAMETER in (mm)	NO. TEETH								
5.2 (132)	8	•		•	•**		•		
6.5 (165)	10	•		•	•**		•		
7.7 (196)	12	•		•	•**				
10.3 (262)	16	•		•	•**				
SERIES 900									
2.1 (53)	6	•		•					
3.1 (79)	9	•		•					
3.5 (89)	10	•		•	•				
4.1 (104)	12	•		•	•	•			
5.1 (130)	15				•				
5.8 (147)	17	•		•	•	•			
6.1 (155)	18	•		•	•	•			
6.8 (173)	20	•		•	•	•			
9.8 (249)	28				•				
SERIES 1100						•			
1.6 (41)	8					•			
2.3 (58)	12								
3.1 (79)	16	•		•					
3.5 (89)	18	•		•	•				
3.8 (97)	20	•							
4.6 (117)	24	•		•	•				
5.1 (130)	26	•		•	•				
6.1 (155)	32	•		•	•				
SERIES 1400									
5.1 (130)	16							•	
5.7 (145)	18							•	
6.7 (170)	21							•	
SERIES 1800									
5.0 (127)	6	•							
6.5 (165)	8	•							
8.1 (206)	10	•							
10.5 (267)	13	•							
SERIES 2000									
6.5 (165) (bottom)	16	•		•					
6.5 (165) (top)	16	•		•					
8.1 (206) (bottom)	20	•		•					
SERIES 2200									
3.9 (99)	8	•		•					
5.3 (135)	11	•		•					
6.3 (160)	13	•		•					
7.7 (196)	16	•		•					
SERIES 2400									
2.0 (51)	6	•							
3.9 (99)	12	•							
5.1 (130)	16	•							
6.4 (163)	20	•							
SERIES 3000									
5.2 (132)	8								•
6.5 (165)	10								•
7.7 (196)	12								•
SERIES 4000									
5.1 (130)	16							•	
5.7 (145)	18							•	
6.7 (170)	21							•	

* For use with Series 400 Flush Grid Acetal and EC Acetal only

** Available in three plate, Abrasion Resistant split design

BELT SELECTION INSTRUCTIONS

To determine if this belt is suitable for your application, its OPERATING LOAD versus OPERATING STRENGTH must be known. The following steps will assist you in making the necessary calculations for this comparison:

STEP 1: CALCULATE THE BELT'S TENSION LOAD OR **BELT PULL, BP**, LB/FT (KG/M)

$$BP = [(M + 2W) \times Fw + M_p] \times L + (M \times H)$$

where:

M = Product Loading, lb/ft^2 (kg/m^2)
W = Belt Weight, lb/ft^2 (kg/m^2) (found on BELT DATA page)
L = Length of Conveyor, ft. (m), $\mathcal{C}_L$ to $\mathcal{C}_L$
H = Elevation Change of Conveyor, ft. (m)
$\mathbf{F_w}$ = Wearstrip to Belt Friction Coefficient
$\mathbf{M_p}$ = **M** x ($\mathbf{F_p}$ x % Belt Backed-Up), loading due to backed up product

Obtain $\mathbf{F_w}$ and $\mathbf{F_p}$ from BELT DATA page of the belt style you are considering. If products are not backed up on belt, ignore $\mathbf{M_p}$.

STEP 2: ADJUST THE CALCULATED **BP** FOR SPECIFIC SERVICE CONDITIONS

Since the belt may experience a variety of conditions, the **BP** should be adjusted by applying an appropriate **SERVICE FACTOR**, **SF**. Determine **SF**:

TABLE 3 - (SF) SERVICE FACTOR

Starts under no load, with load applied gradually		0.1
Frequent starts under load (more than once per hour)	ADD 0.2	
At speeds greater than 100 FPM (Feet Per Minute) (30 meters/min)	ADD 0.2	
Elevating Conveyors	ADD 0.4	
Pusher Conveyors	ADD 0.2	
	TOTAL	

NOTE: At speeds greater than 50 FPM (15 meters/min) on conveyors that are started with backed-up lines, soft start motors should be considered.

The **ADJUSTED BELT PULL, ABP**, is determined by:

$$ABP = BP \times SF$$

STEP 3: CALCULATE **ALLOWABLE BELT STRENGTH, ABS**

The **ALLOWABLE BELT STRENGTH** may, because of specific operating conditions, be less than the **RATED BELT STRENGTH** shown on the **BELT DATA** page. Therefore, the **ABS** should be calculated from:

$$ABS = BS \times T \times S$$

where:

BS = **BELT STRENGTH** from BELT DATA page

T = **TEMPERATURE FACTOR** from page 2-3 or 4-11

S = **STRENGTH FACTOR** from BELT DATA page

The **STRENGTH FACTOR** is found at the intersection of the **SPEED/LENGTH RATIO** and the appropriate sprocket line. To get the **SPEED/LENGTH RATIO**, divide the belt speed (ft/min) by the shaft ℄ distance (ft). The **STRENGTH FACTOR** adjusts the belt rating to account for wear caused by the combination of high speed, short conveyor lengths and small sprocket sizes.

STEP 4: COMPARE **ABP** WITH **ABS**

If the **ABS** exceeds **ABP**, this belt is strong enough for your application. You should proceed to the next steps to determine DRIVE SHAFT SPROCKET SPACING, SHAFT STRENGTH and HORSEPOWER REQUIRED.

If the **ABS** is less than **ABP** *and* you are able to change some parameters of your application (i.e., product load distribution or belt speed), the recalculated **ABP** may become acceptable.

ABP= ADJUSTED BELT PULL, lb/ft (kg/m) of belt width

STEP 5: DETERMINE MAXIMUM SPACING OF DRIVE SHAFT SPROCKETS

Using the **ADJUSTED BELT PULL, ABP**, find the maximum sprocket spacing from the graph on the SPROCKET DATA page of the Series you are considering. The spacing of sprockets on idler shafts may, under some circumstances, be greater than drive spacing, but should never exceed 6.0 in. (152 mm) for all Series (except **Series 200** where maximum spacing should never exceed 7.5 in. [191 mm]).

STEP 6: CONFIRM DRIVE SHAFT STRENGTH

Drive shafts must be stiff enough to resist excessive bending or deflecting under the belt's pull and strong enough to transmit the required torque from the driver. Therefore, both the **DRIVE SHAFT DEFLECTION** and **TORQUE** must be determined to insure an adequate shaft selection.

Select a shaft size which fits your sprocket of choice from the **SPROCKET DATA** page. **NOTE:** Most sprockets have more than one available bore size.

The shaft deflects under the combined loads of the **ADJUSTED BELT PULL** and its own **WEIGHT**. The **TOTAL SHAFT LOAD**, **w**, is found from:

$$w = (ABP + Q) \times B$$

where:

Q = SHAFT WEIGHT, lb/ft (kg/m), from SHAFT DATA table

B = BELT WIDTH, ft. (m)

For shafts supported by two bearings, the **DEFLECTION, D**, is calculated from:

$$D = \frac{5}{384} \times \frac{w \times L_S^3}{E \times I}$$

where:

Ls = LENGTH OF SHAFT between bearings, in. (mm)

E = MODULUS OF ELASTICITY from SHAFT DATA table

I = MOMENT OF INERTIA from SHAFT DATA table

NOTE: For shafts supported by three bearings, see the Deflection Formula on page 4-6.

If the calculated deflection is less than the recommended maximum of 0.10 in. (2.5 mm) for standard conveyors or 0.22 in. (5.6 mm) for bidirectional units, calculate the required **TORQUE**. If not, use a larger size shaft, a stronger material or a shorter span between bearings, and recalculate the deflection.

The **TORQUE**, T_o, to be transmitted is determined from:

$$T_o = ABP \times B \times \frac{PD}{2}$$

where:

PD =PITCH DIAMETER OF SPROCKET from the SPROCKET DATA PAGE

Now compare T_o with the MAXIMUM RECOMMENDED TORQUE, Table 8, for shaft journal sizes shown on page 4-12. Using a journal diameter which can be machined on the shaft selected, determine its maximum recommended torque. This value should exceed T_o. If not, try a stronger material or larger shaft.

STEP 7: DETERMINE THE **POWER** NEEDED TO DRIVE THE BELT

DRIVE HORSEPOWER, **HP**, is found from:

$$HP = \frac{ABP \times B \times V}{33000}$$

where:

ABP= ADJUSTED BELT PULL, lb/ft of belt width

B = BELT WIDTH, ft.

V = BELT SPEED, ft/min

POWER in **WATTS** is found from:

$$WATTS = \frac{ABP \times B \times V}{6{,}12}$$

1 HP = 745.7 WATTS

where:

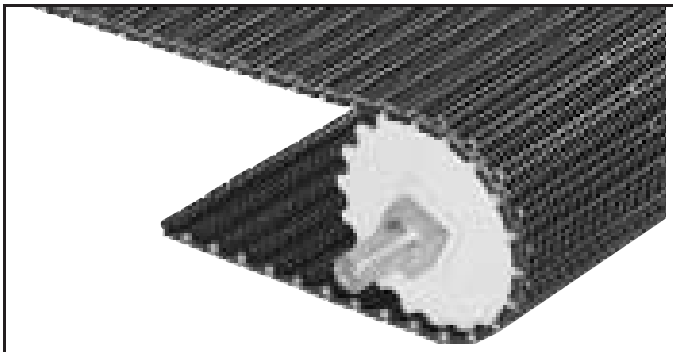
ABP= ADJUSTED BELT PULL, kg/m of belt width

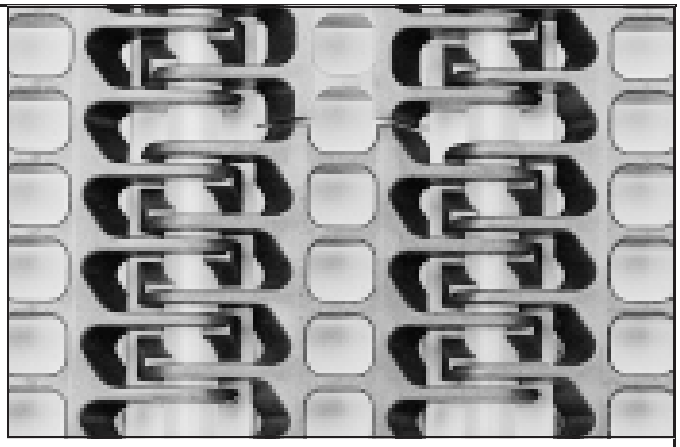
B = BELT WIDTH, m

V = BELT SPEED, m/min

To obtain the required **motor** power you should add expected power losses in the drive train between drive shaft and motor to the calculated **POWER**. See Section 3, **Design Guidelines**, page 3-5, for recommendations.

Having determined the suitability of this belt, the sprocket spacing, the drive shaft size and the power requirements, you are now ready to select **ACCESSORIES** and to design the conveyor assembly.

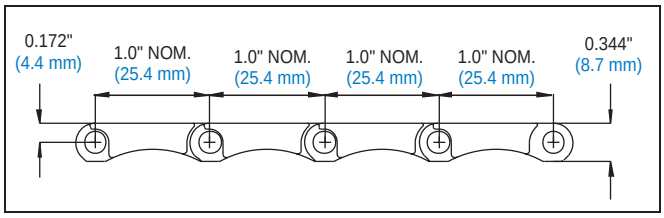




FLUSH GRID, 31% Open Area

USDA accepted (Meat and Poultry)

- Opening size (approximate): 0.2 in. (5.1 mm) x 0.2 in. (5.1 mm).
- Nominal 1.0 in. (25.4 mm) pitch, centre-driven, open hinge, with fully flush edges.
- Lightweight, relatively strong belt with smooth upper surface.
- Smaller pitch reduces chordal action and transfer dead plate gap.
- Custom-built in widths from 1 in. (25.4 mm) and up, in approximately 0.25 in. (6.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

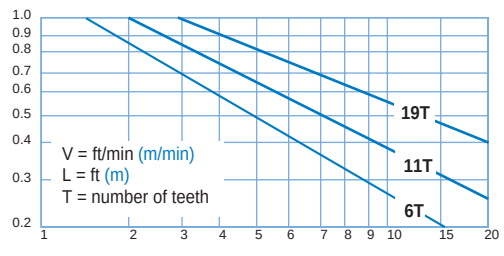
Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability		
					FDA (USA)	USDA-Meat and Poultry	Agriculture Canada
Polypropylene*	Polypropylene	300 (450)	34 (1) to 220 (104)	0.54 (2.64)	•	•	•
Polyethylene	Polyethylene	200 (300)	-50 (-46) to 150 (66)	0.58 (2.83)	•	•	•
Acetal	Polypropylene	600 (890)	34 (1) to 200 (93)	0.78 (3.81)	•	•	•
EC Acetal	Polypropylene	400 (595)	34 (1) to 200 (93)	0.78 (3.81)			
Acetal**	Polyethylene	550 (820)	-50 (-46) to 70 (21)	0.78 (3.81)	•	•	•

* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	-- (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	-- (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	-- (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	-- (0.18)	0.33 (0.27)
EC Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.19 (0.20)	0.13 (0.16)	-- (0.18)	0.33 (0.27)
(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR= not recommended									

* Polyethylene is not recommended for container handling

S Strength Factor

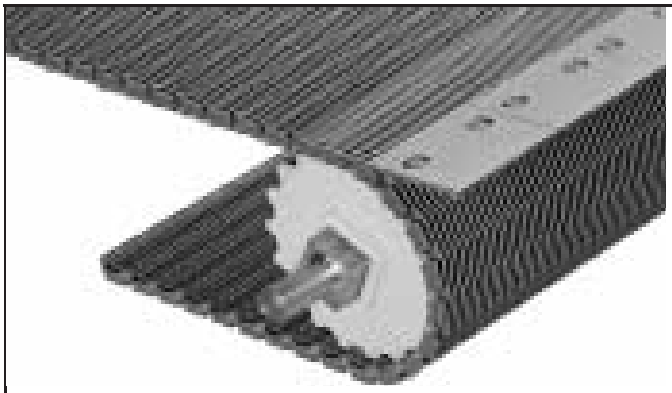


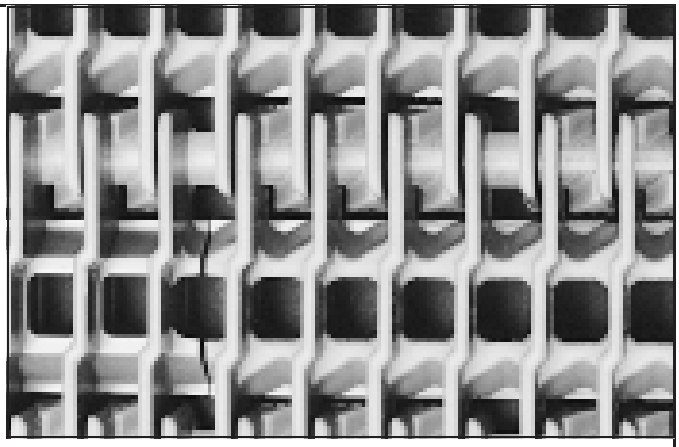
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

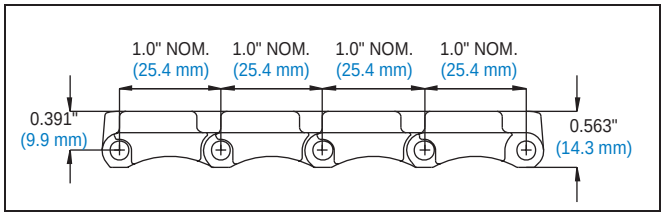
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 100** is on pages 2-11 to 2-13.
- For more material selections and stronger belt performance, see **Series 900** and **Series 1100 Flush Grid** styles on pages 2-45 and 2-61, respectively.





RAISED RIB
31% Open Area
28% Product Contact Area
USDA accepted (Meat and Poultry)

- Opening size (approximate): 0.2 in. (5.1 mm) x 0.2 in. (5.1 mm).
- Nominal 1.0 in. (25.4 mm) pitch, centre-driven, open hinge, with fully flush edges.
- Smooth upper surface with closely spaced ribs can be used with Finger Transfer Plates, eliminating product tippage and hang-ups.
- Custom-built in widths from 1 in. (25.4 mm) and up, in approximately 0.25 in. (6.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	Agriculture Canada
Polypropylene*	Polypropylene	300 (450)	34 (1) to 220 (104)	0.82 (4.00)	•	•	•
Polyethylene	Polyethylene	200 (300)	-50 (-46) to 150 (66)	0.88 (4.29)	•	•	•
Acetal	Polypropylene	600 (890)	34 (1) to 200 (93)	1.20 (5.86)	•	•	•
Acetal**	Polyethylene	550 (820)	-50 (-46) to 70 (21)	1.20 (5.86)	•	•	•

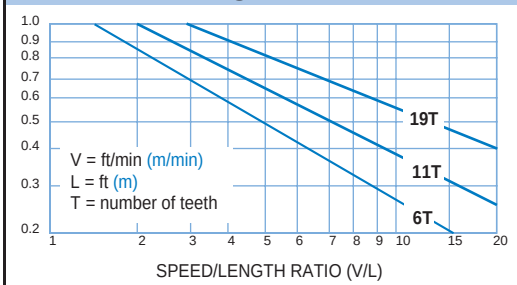
* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor



Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 100** is on pages 2-11 to 2-13.
- For more material selections and stronger belt performance, see **Series 900 Raised Rib** on page 2-49.

Intralox has moulded sprockets for **Series 100** with 6, 11 and 19 teeth. Split sprockets are available for the 11 and 19 tooth sizes. Intralox can machine sprockets (both plastic and split) with different numbers of teeth if the application cannot use the standard sizes. The standard sprocket dimensions are listed in Table A. Shaft information is listed in Table B.

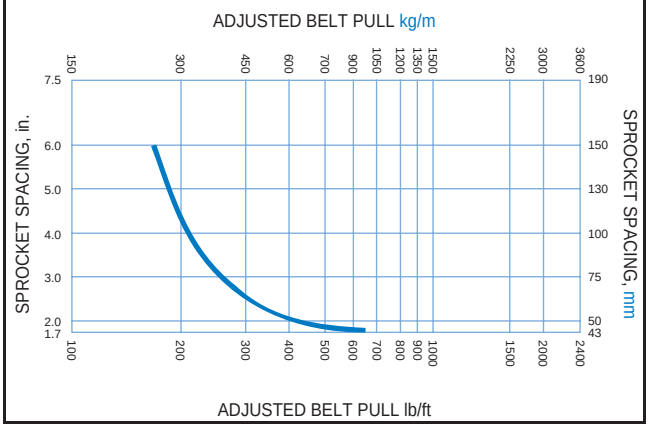
The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

SPROCKET AND SUPPORT QUANTITY REFERENCE

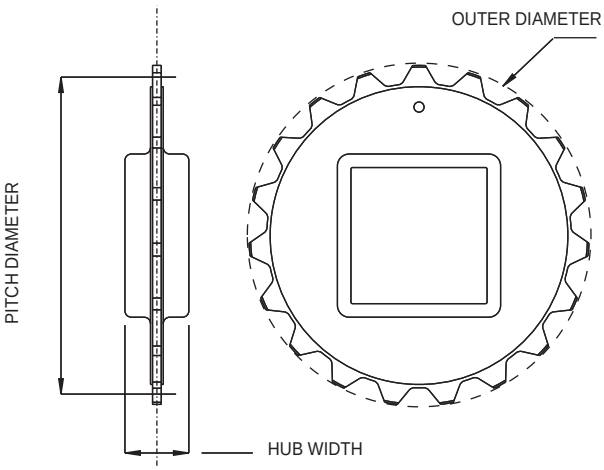
Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
2 (51)	1	2	2
4 (102)	1	2	2
6 (152)	2	2	2
7 (178)	2	3	2
8 (203)	2	3	2
10 (254)	2	3	2
12 (305)	3	3	2
14 (356)	3	4	3
15 (381)	3	4	3
16 (406)	3	4	3
18 (457)	3	4	3
20 (508)	5	5	3
24 (610)	5	5	3
30 (762)	5	6	4
32 (813)	7	7	4
36 (914)	7	7	4
42 (1067)	7	8	5
48 (1219)	9	9	5
54 (1372)	9	10	6
60 (1524)	11	11	6
72 (1829)	13	13	7
84 (2134)	15	15	8
96 (2438)	17	17	9
120 (3048)	21	21	11
144 (3658)	25	25	13
For Other Widths, Use Odd Number of Sprockets** at Maximum 6 in. (152 mm) ℄ Spacing		Maximum 6 in. (152 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

* **NOTE**: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications.
** The centre sprocket should be locked down. With only two sprockets, fix the sprocket on the drive journal side only.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



SERIES 100 MOULDED 19 TOOTH SPROCKET

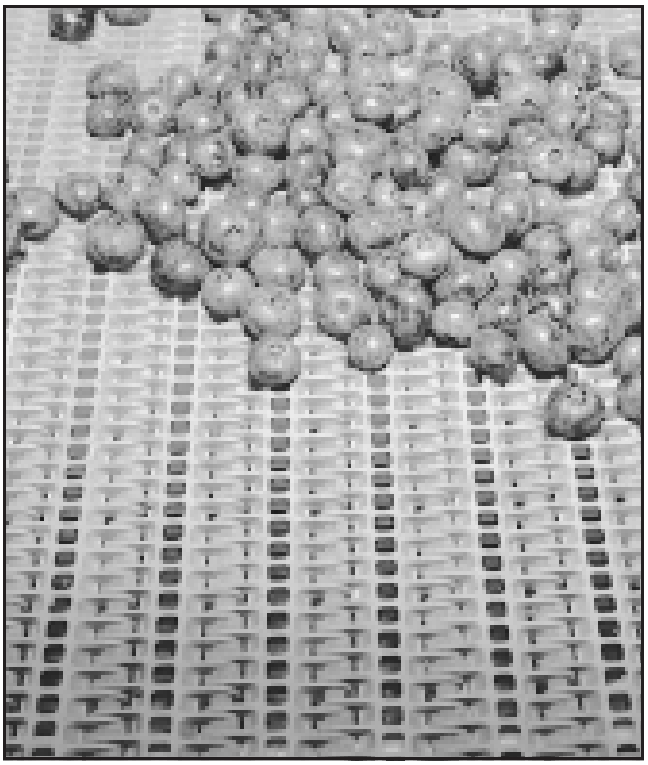


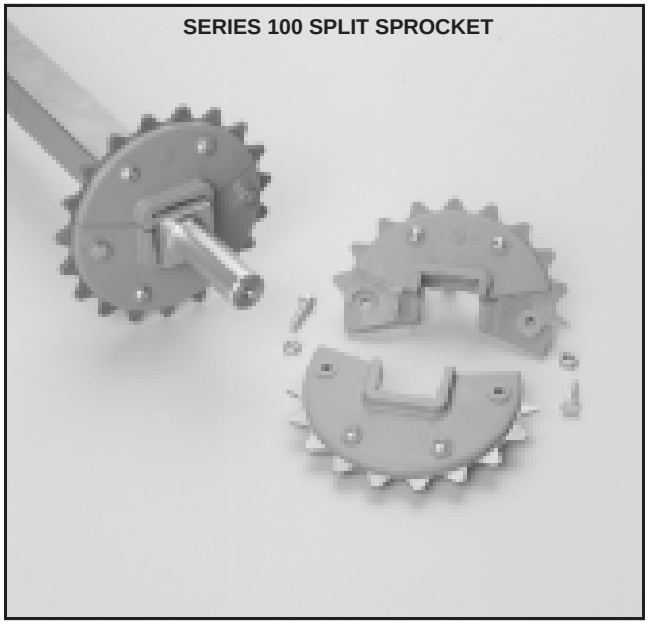
A — SPROCKET DATA

No. of Teeth (Chordal Action)	NOM. Pitch Dia. in (mm)	NOM. Outer Dia. in (mm)	NOM. Hub Width in (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.	Square in.	Round (mm)	Square (mm)
MOULDED SPROCKETS							
6 (13.40%)	2.0 (51)	2.1 (53)	0.75 (19)		1.0		
11 (4.05%)	3.5 (89)	3.7 (94)	0.75 (19)		1.0		(40)
					1.5		
19 (1.36%)	6.1 (155)	6.3 (160)	1.25 (32)		1.0		(40)
					1.5		(60)
SPLIT SPROCKETS							
11 (4.05%)	3.5 (89)	3.7 (94)	1.5 (38)		1.5		(40)
19 (1.36%)	6.1 (155)	6.3 (160)	1.5 (38)		1.5		(40)
					2.5		(60)
Call Customer Service for lead-times.							

Split sprockets are constructed of a 304 stainless steel tooth bearing plate sandwiched between bore specific, polypropylene hubs. For acid applications, the plate may be made of 316 stainless steel. Stainless steel teeth are generally more abrasion resistant than plastic teeth, thus increasing normal sprocket life. Split sprockets are constructed of FDA compliant materials, but are not USDA accepted for food contact applications.

Installing or removing split sprockets (sub-assembled by Intralox) is accomplished using only two bolts. On new equipment, shafts can be mounted and plumbed before sprocket installation. On existing equipment, sprockets may be replaced without removing the shafts. Split sprockets and moulded sprockets can be used together on the same shaft.





B — SHAFT DATA

SIZE	Q SHAFT WEIGHT, lb/ft (kg/m) ALUMINIUM	CARBON STEEL	STAINLESS STEEL	I MOMENT OF INERTIA in.^{4} (mm^4)
1.0 IN. SQUARE	1.17* (1.74)	3.40* (5.06)	3.40* (5.06)	0.083 (34,600)
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (11.38)	0.42 (175,600)
2.5 IN. SQUARE	7.34 (10.92)	21.25* (31.62)	21.25* (31.62)	3.25 (1,355,000)
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
60 mm SQUARE	(10.05) 6.75	(29.11)** 19.56	(29.11)** 19.56	(1,080,000) 2.78
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

**Intralox USA offers square shafting in these materials and sizes.
Intralox USA offers square shafting in these materials and sizes.
** Intralox Europe offers square shafting in carbon and stainless steel and sizes.

BELT ACCESSORIES

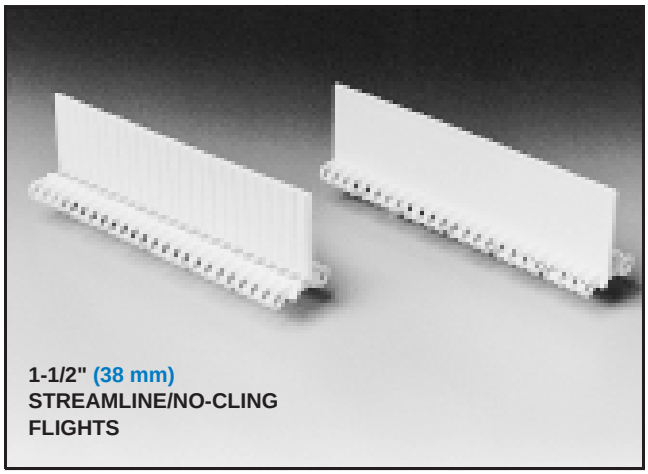
FLIGHTS — Intralox Streamline/No-Cling Flights are 1.5 in. (38 mm) high. These flights can be cut down to any height. Each flight rises out of the centre of its supporting module, moulded as an integral part. No fasteners are required. One side of the flight is smooth (Streamline) while the other is ribbed vertically (No-Cling). Flights can be provided in linear increments of 1 in. (25 mm). The minimum indent (without sideguards) is 0.5 in. (13 mm).

SIDEGUARDS — Sideguards are used with Flush Grid belts to assure product containment. The 2 in. (51 mm) high sideguards are of the standard overlapping design, and are an integral part of the belt, fastened by the hinge rods. The minimum indent is 0.75 in. (19 mm). The standard gap between the sideguards and the edge of a flight is 0.06 in. (2 mm). When going around the 6 and 11 tooth sprockets, the sideguards will fan out, opening a gap at the top of the sideguard which might allow small products to fall out. The sideguards stay completely closed when wrapping around the 19 tooth sprocket.

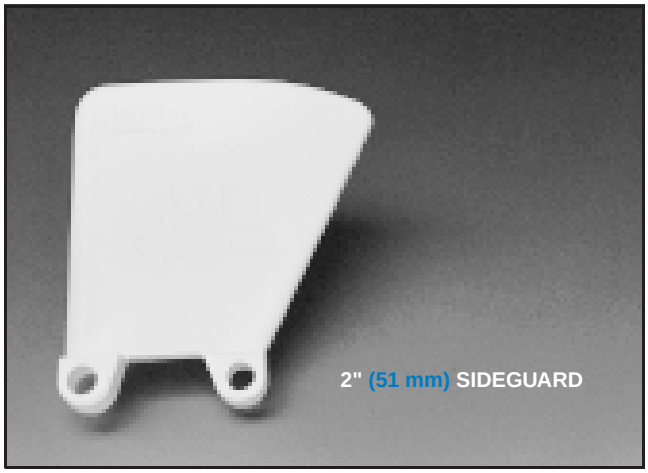
FINGER TRANSFER PLATES — These comb-like plates are designed to be used with **Series 100 Raised Rib** belts to eliminate product transfer and tipping problems. The fingers extend between the belt's ribs allowing a smooth continuation of the product flow as the belt engages its sprockets. Finger Transfer Plates are installed easily on the conveyor frame with conventional fasteners.

SERIES 100 ACCESSORIES (Nominal Dimensions)		
Flights	**Sideguards**	**Finger Transfer Plates**
1-1/2 in. (38 mm)	2 in. (51 mm)	4 in. (102 mm) 16 Fingers
AVAILABLE MATERIALS		
Acetal Polypropylene Polyethylene	Acetal Polypropylene Polyethylene	Acetal
Contact Customer Service for lead-times.		

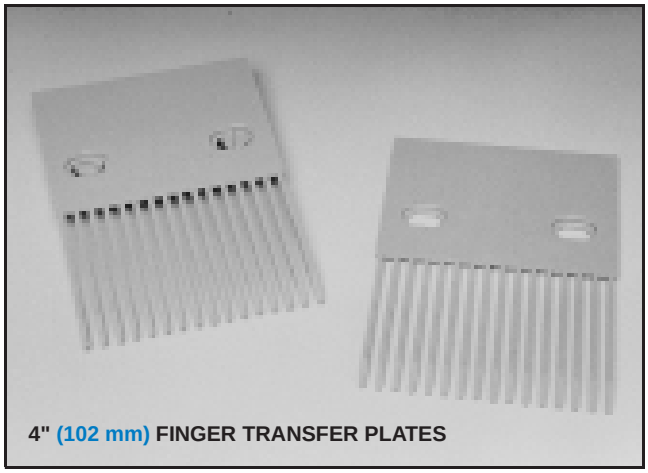
SERIES 100 FLUSH GRID BELT, 1-1/2" (38 mm) STREAMLINE FLIGHTS, 2" (51 mm) SIDEGUARDS



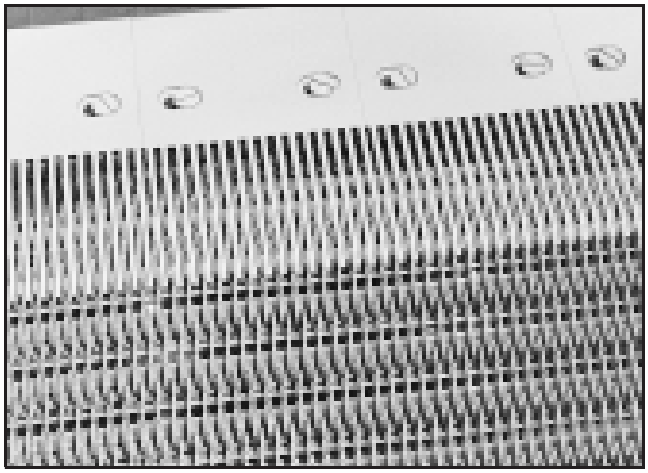
1-1/2" (38 mm) STREAMLINE/NO-CLING FLIGHTS



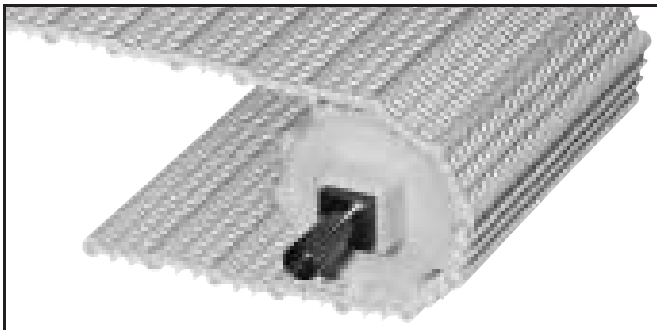
2" (51 mm) SIDEGUARD

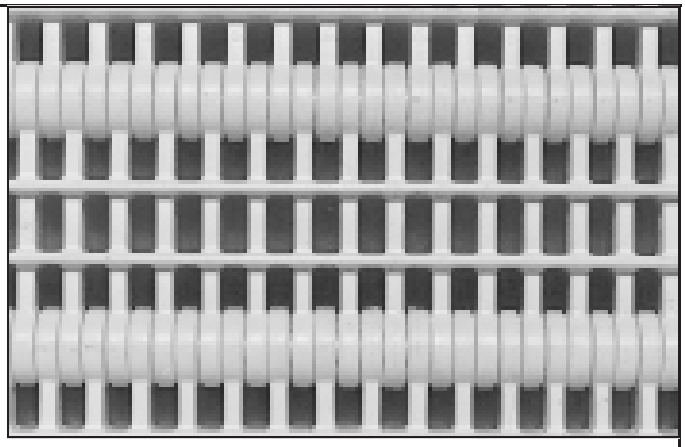


4" (102 mm) FINGER TRANSFER PLATES



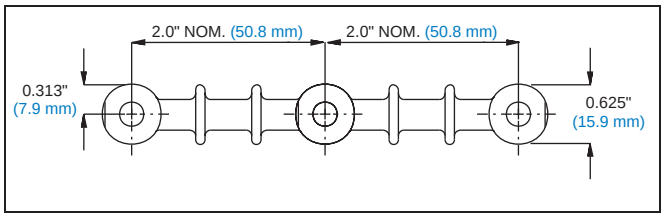
SERIES 100 RAISED RIB BELT WITH FINGER TRANSFER PLATES





OPEN GRID, 33% Open Area

- Opening size (approximate): 0.23 in. (5.8 mm) x 0.48 in. (12.3 mm).
- Nominal 2.0 in. (50.8 mm) pitch, hinge-driven, fully enclosed hinge rods.
- Low profile transverse ridges assist in moving products up or down inclines.
- Large, open area allows excellent drainage.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.36 in. (9.1 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	1400 (2080)	34 (1) to 220 (104)	1.24 (6.05)	•		
Polyethylene	Polyethylene	900 (1340)	-100 (-73) to 150 (66)	1.26 (6.15)	•		

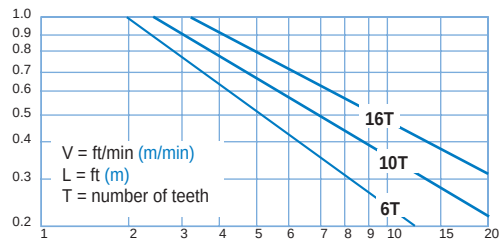
* Do not use PP in high impact conditions below 7°C.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

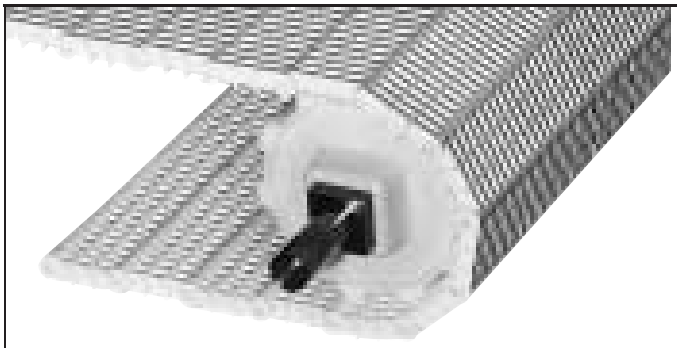


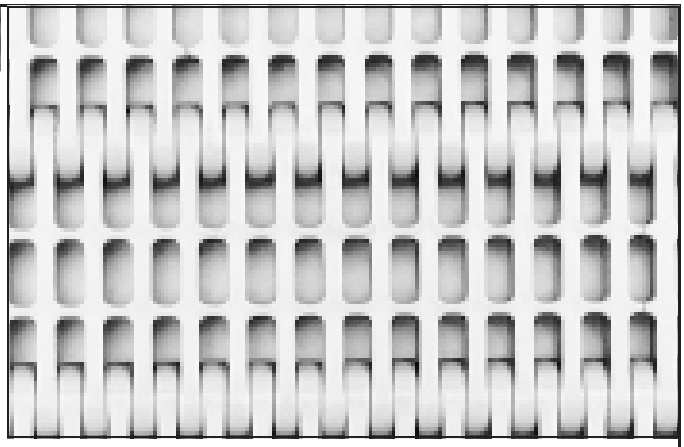
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

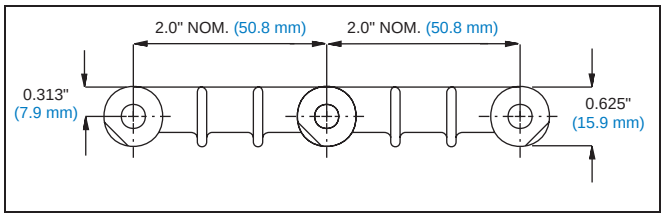
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 200** is on pages 2-20 to 2-21.
- **Series 200 Open Grid** has double-headed hinge rods so the belt edge is not fully flush.





FLUSH GRID, 33% Open Area

- Opening size (approximate): 0.22 in. (5.5 mm) x 0.49 in. (12.5 mm).
- Nominal 2.0 in. (50.8 mm) pitch, hinge-driven, fully enclosed hinge rods.
- Flush grid pattern with smooth upper surface.
- Offers excellent lateral movement of containers.
- One of the strongest belt styles in **Series 200**.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.36 in. (9.1 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	1800 (2080)	34 (1) to 220 (104)	1.40 (6.83)	•		
Polyethylene	Polyethylene	1200 (1340)	-100 (-73) to 150 (66)	1.44 (7.03)	•		

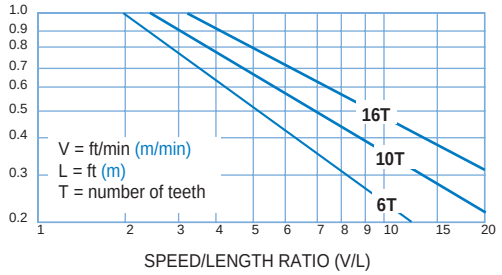
* Do not use PP in high impact conditions below 7°C.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

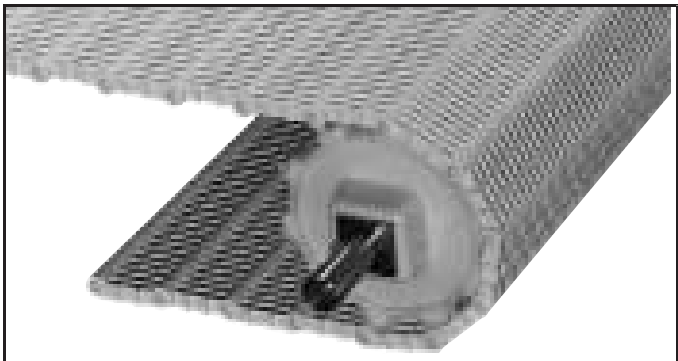
S Strength Factor

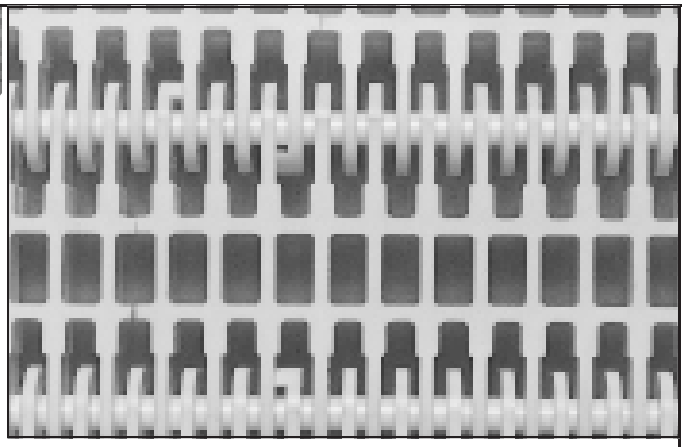


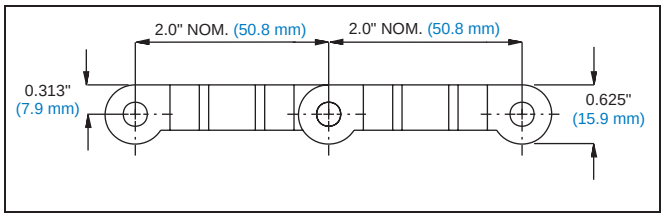
Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 200** is on pages 2-20 to 2-21.
- For an alternative to **Series 200 Flush Grid** with more material selections, see **Series 400** (page 2-23), **Series 900** (page 2-45), **Series 1100** (page 2-61) and **Series 2200** (page 2-81) belt styles.
- **Series 200 Flush Grid** has double-headed hinge rods so the belt edge is not fully flush.







OPEN HINGE, 45% Open Area

USDA accepted (Meat and Poultry, and Dairy)

- Opening size (approximate): 0.26 in. (6.7 mm) x 0.48 in. (12.3 mm).
- Nominal 2.0 in. (50.8 mm) pitch, hinge-driven.
- Exposed hinge rods, smooth surface and generous open area for food handling.
- Ideal where air cooling, washing or drying is required.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.36 in. (9.1 mm) increments. ***(See Important NOTE on page 1-8)***

Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability			
					FDA (USA)	USDA MEAT and Poultry	USDA Dairy*	Agriculture Canada
Polypropylene**	Polypropylene	300 (450)	34 (1) to 220 (104)	1.04 (5.08)	•	•	White	•
Polyethylene	Polyethylene	200 (300)	-50 (-46) to 150 (66)	1.12 (5.47)	•	•	Natural	•

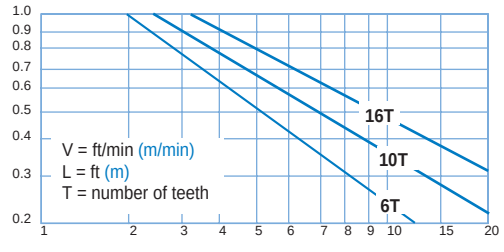
* USDA Dairy acceptance requires the use of a clean-in-place system.
** Do not use PP in high impact conditions below 7°C.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

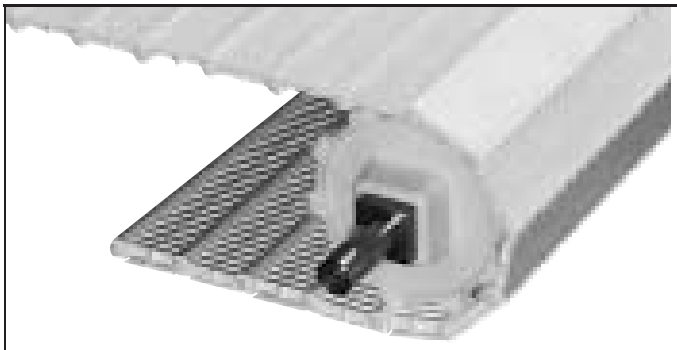
S Strength Factor



Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

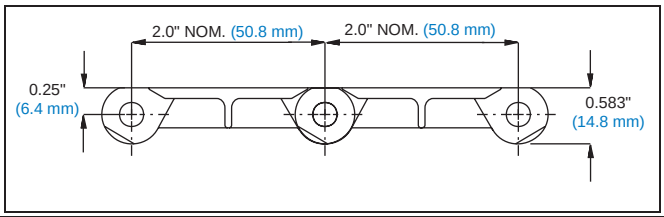
Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 200** is on pages 2-20 to 2-21.
- For stronger belt performance, see **Series 400 Open Hinge** on page 2-25.
- **Series 200 Open Hinge** has double-headed hinge rods so the belt edge is not fully flush.



FLAT TOP, 0% Open Area

- Nominal 2.0 in. (50.8 mm) pitch, hinge-driven, fully enclosed hinge rods.
- Smooth, closed surface.
- Flush belt edges allow easy side product transfer.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.36 in. (9.1 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	1400 (2080)	34 (1) to 220 (104)	1.18 (5.76)	•		
Polyethylene	Polyethylene	900 (1340)	-100 (-73) to 150 (66)	1.20 (5.86)	•		

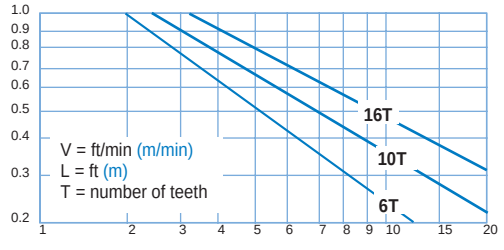
* Do not use PP in high impact conditions below 7°C.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

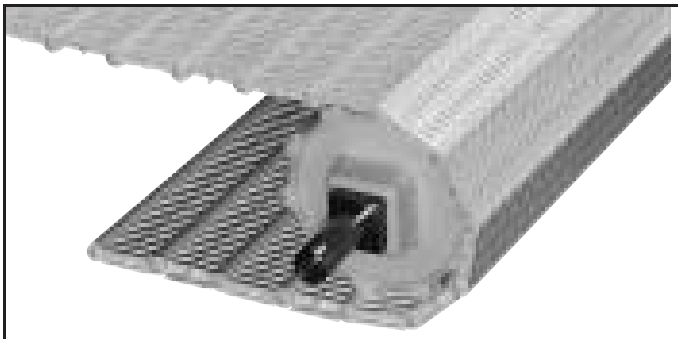


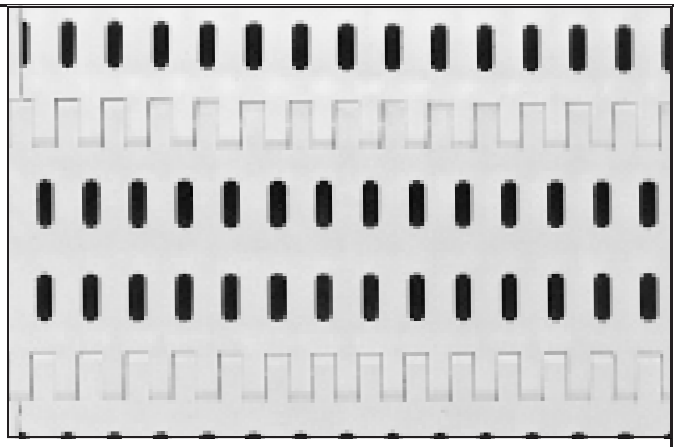
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

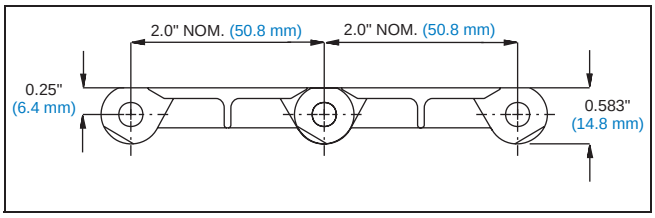
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 200** is on pages 2-20 to 2-21.
- For alternatives to **Series 200 Flat Top** with more material selections, see **Series 400 Flat Top** (page 2-26), **Series 800 Flat Top** (page 2-33), **Series 900 Flat Top** (page 2-50) and **Series 1400 Flat Top** (page 2-69) belt styles.





PERFORATED FLAT TOP, 12% Open Area

- Opening size (approximate): 0.12 in. (3.1 mm) x 0.37 in. (9.4 mm).
- Nominal 2.0 in. (50.8 mm) pitch, hinge-driven, fully enclosed hinge rods.
- Smooth, flat surface with nominal open area for product drainage.
- Flush edges ideal for side product transfer.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.36 in. (9.1 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	1400 (2080)	34 (1) to 220 (104)	1.12 (5.47)	•		
Polyethylene	Polyethylene	900 (1340)	-100 (-73) to 150 (66)	1.18 (5.76)	•		

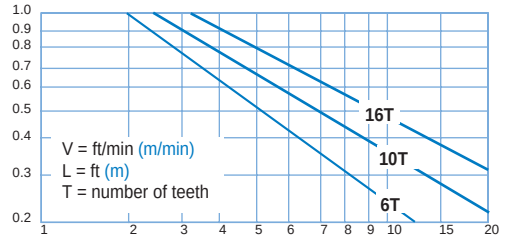
* Do not use PP in high impact conditions below 7°C.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor



Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 200** is on pages 2-20 to 2-21.
- For alternatives to **Series 200 Perforated Flat Top** with more material selections, see **Series 800 Perforated Flat Top** (pages 2-34 and 2-35) and **Series 900 Perforated Flat Top** (page 2-50) belt styles.

Intralox has moulded sprockets for **Series 200** with 6, 10 and 16 teeth and Abrasion Resistant sprockets. Intralox can machine sprockets with different numbers of teeth if the application cannot use the standard sizes. The standard sprockets dimensions are listed in Table A. Shaft information is listed in Table B.

The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

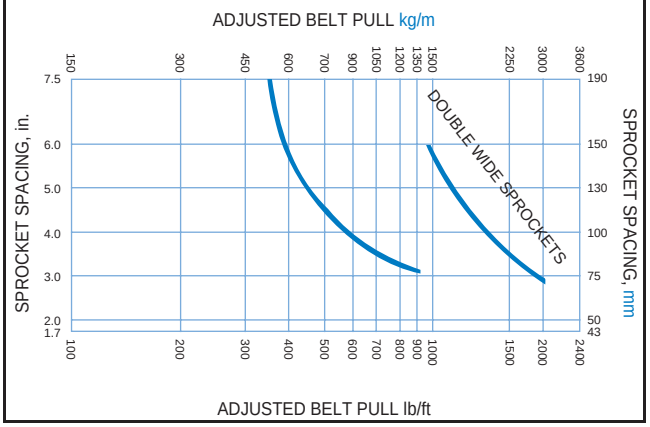
SPROCKET AND SUPPORT QUANTITY REFERENCE

Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
2 (50.8)	1	2	2
4 (102)	1	2	2
6 (152)	2	2	2
7 (178)	2	2	2
8 (203)	2	2	2
10 (254)	2	3	2
12 (305)	3	3	2
14 (356)	3	3	3
15 (381)	3	3	3
16 (406)	3	3	3
18 (457)	3	3	3
20 (508)	3	4	3
24 (610)	5	4	3
30 (762)	5	5	4
32 (813)	5	5	4
36 (914)	5	5	4
42 (1067)	7	6	5
48 (1219)	7	7	5
54 (1372)	9	7	6
60 (1524)	9	8	6
72 (1829)	11	8	7
84 (2134)	13	11	8
96 (2438)	13	12	9
120 (3048)	17	15	11
144 (3658)	21	27	13
For Other Widths, Use Odd Number of Sprockets** at Maximum 7.5 in. (191 mm) ℄ Spacing		Maximum 9 in. (229 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

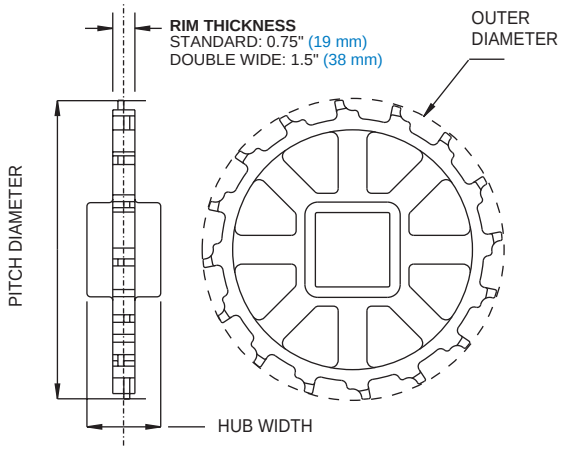
* NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications

** The centre sprocket should be locked down. With only two sprockets, fix the sprocket on the drive journal side only.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



SERIES 200 MOULDED 16 TOOTH SPROCKET



A — SPROCKET DATA

No. of Teeth (Chordal Action)	NOM. Pitch Dia. in. (mm)	NOM. Outer Dia. in. (mm)	NOM. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.	Square in.	Round (mm)	Square (mm)
MOULDED SPROCKETS							
6 (13.40%)	4.0 (102)	3.9 (99)	1.5 (38)		1.4		(40)
10 (4.89%)	6.4 (163)	6.4 (163)	2.5 (64)		1.5		(40))
					2.5*		(60)
16 (1.92%)	10.1 (257)	10.3 (262)	2.5 (64)		1.5		(40)
					2.5*		
DOUBLE WIDE RIM MOULDED SPROCKETS							
10 (4.89%)	6.4 (163)	6.4 (163)	2.5 (64)		1.5		(40)
ABRASION RESISTANT SPROCKETS							
10 (4.89%)	6.4 (163)	6.4 (163)	1.1 (28)		1.5		(40)
					2.5		(60)
16 (1.92%)	10.1 (257)	10.3 (262)	1.1 (28)		1.5		(40)
					2.5		(60)*

*Intralox has metric sprocket bore for 65 mm shafts. Specify metric bore when ordering.

Call Customer Service for lead-times.

B — SHAFT DATA

SIZE	Q SHAFT WEIGHT, lb/ft (kg/m)			I MOMENT OF INERTIA in.^{4} (mm^4)
	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	
1.0 IN. SQUARE	1.17* (1.74)	3.40* (5.06)	3.40* (5.06)	0.083 (34,600)
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (11.38)	0.42 (175,600)
2.5 IN. SQUARE	7.34 (10.92)	21.25* (31.62)	21.25* (31.62)	3.25 (1,355,000)
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
60 mm SQUARE	(10.05) 6.75	(29.11)** 19.56	(29.11)** 19.56	(1,080,000) 2.78
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

* Intralox USA offers square shafting in these materials and sizes.

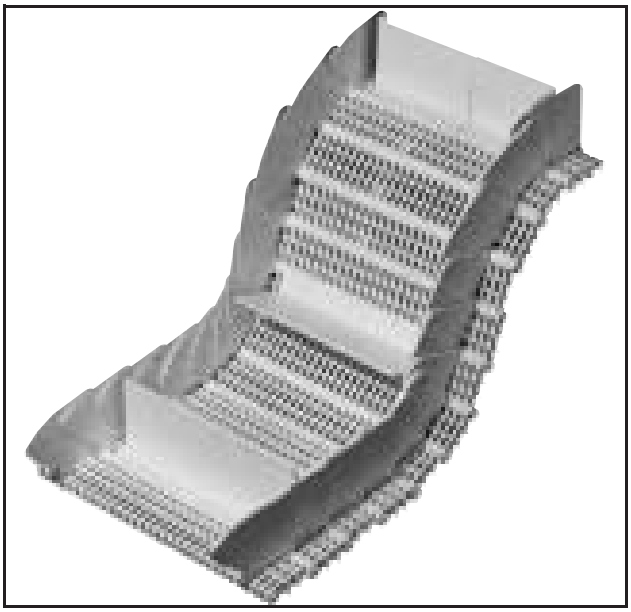
** Intralox Europe offers square shafting in these materials and sizes.

BELT ACCESSORIES

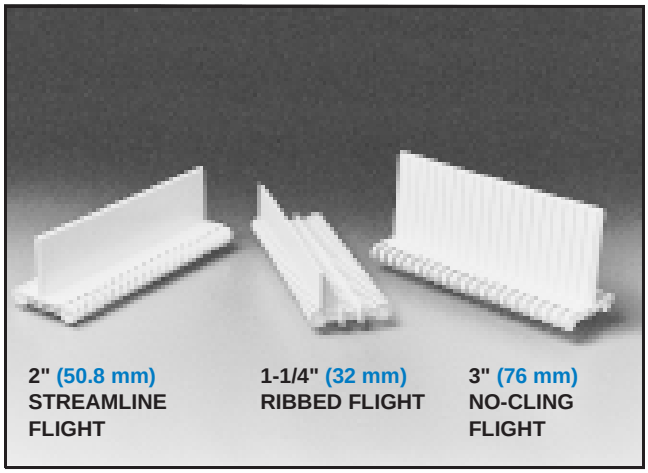
FLIGHTS — Intralox Streamline (smooth) Flights are available in 1 in. (25 mm), 2 in. (51 mm) and 3 in. (76 mm) heights. A 3 in. (76 mm) No-Cling Flight (vertically ribbed for product release) is also available. Each flight rises out of the centre of its supporting Flat Top module, moulded as an integral part. No fasteners are required. 1.25 in. (32 mm) and 3 in. (76 mm) Ribbed Flights are also available. These rise out of Open Grid modules and have triangular shaped buttresses on the back side. Streamline Flights can be enlarged to 6 in. (152 mm) high with a welded extension. Welded bent flights are also available. The minimum indent (without sideguards) is 0.7 in. (18 mm).

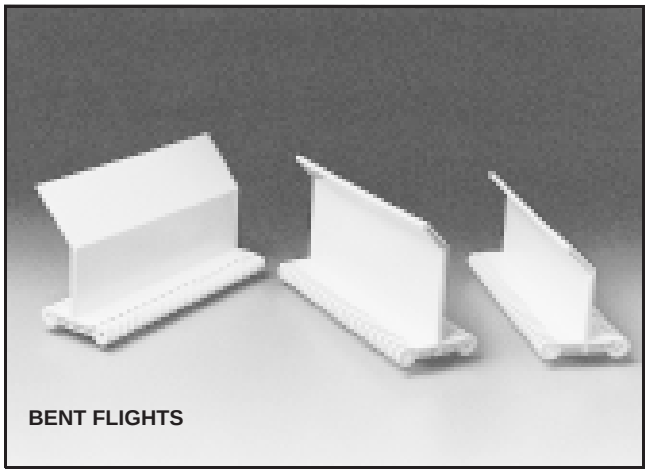
SIDEGUARDS — Sideguards are used to assure product containment and are available in 2 in. (51 mm), 3 in. (76 mm) and 4 in. (102 mm) heights. They are of the standard overlapping design and are an integral part of the belt, fastened by the hinge rods. The minimum indent is 0.7 in. (18 mm). The normal gap between the sideguards and the edge of a flight is 0.3 in. (8 mm). When going around the 6 tooth sprocket, the sideguards will fan out, opening a gap at the top of the sideguard which might allow small products to fall out. The sideguards stay completely closed when going around the 10 and 16 tooth sprockets.

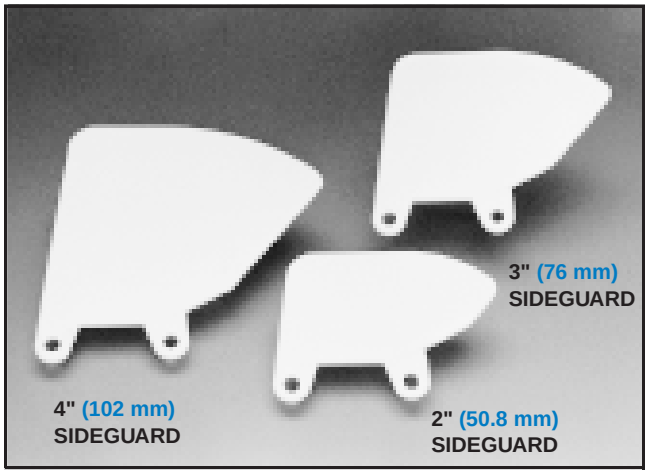
SERIES 200 ACCESSORIES (Nominal Dimensions)			
Streamline Flights	**No-Cling Flights**	**Ribbed Flights**	**Sideguards**
1 in. (25 mm) 2 in. (51 mm) 3 in. (76 mm)	3 in. (76 mm)	1-1/4 in. (32 mm) 3 in. (76 mm)	2 in. (51 mm) 3 in. (76 mm) 4 in. (102 mm)
AVAILABLE MATERIALS			
Polypropylene Polyethylene	Polypropylene Polyethylene	Polypropylene Polyethylene	Polypropylene Polyethylene
Series 200 Streamline Flights can be extended to 6 in. (152 mm) high (welded extension). Extensions can also be welded at a 45° angle for bent flights.			



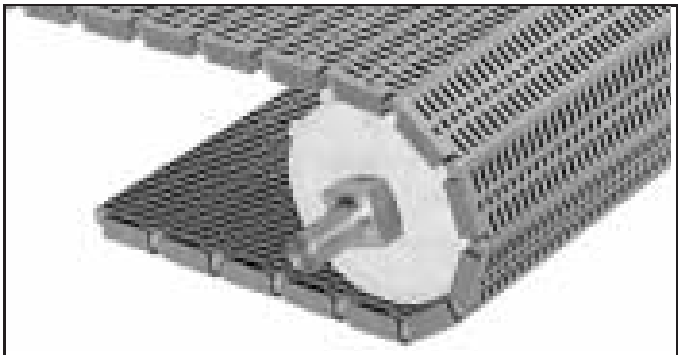
SERIES 200 FLUSH GRID BELT, 3" (76 mm) STREAMLINE FLIGHTS, 3" (76 mm) SIDEGUARDS

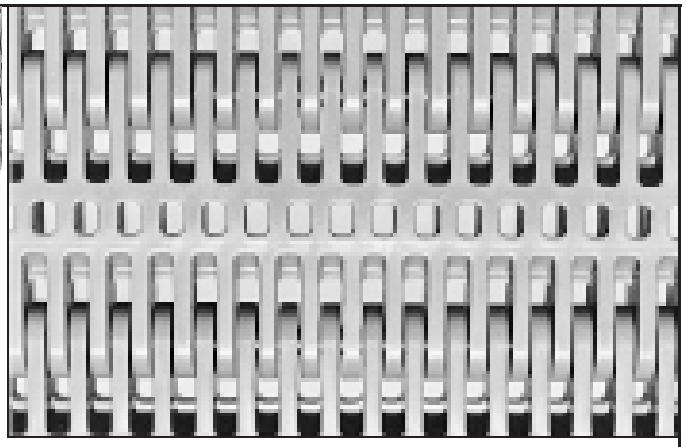






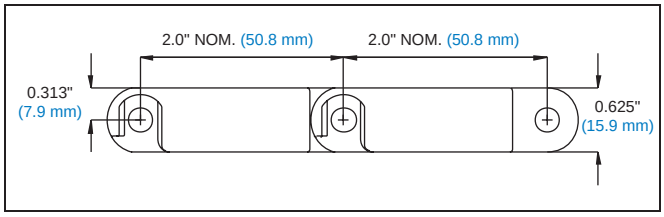
NOTES





FLUSH GRID, 17% Open Area

- Opening size: (approximate) 0.25 in. (6.4 mm) x 0.18 in. (4.6 mm).
- Nominal 2.0 in. (50.8 mm) pitch, closed hinge, centre-driven with fully flush edges.
- Highest strength rating of all Intralox belts (along with **Series 400 Raised Rib** and **Flat Top**).
- Smooth upper surface and straightforward design provides free product movement.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	2400 (3570)	34 (1) to 220 (104)	1.82 (8.89)	•		
Polyethylene	Polyethylene	1800 (2680)	-100 (-73) to 150 (66)	1.90 (9.28)	•		
Acetal	Polypropylene	3200 (4760)	34 (1) to 200 (93)	2.77 (13.51)	•		
EC Acetal	Polypropylene	2400 (3570)	34 (1) to 200 (93)	2.77 (13.51)			
Acetal**	Polyethylene	3000 (4460)	-50 (-46) to 70 (21)	2.77 (13.51)	•		

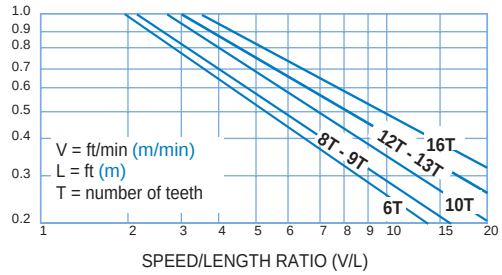
* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
EC Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.19 (0.20)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

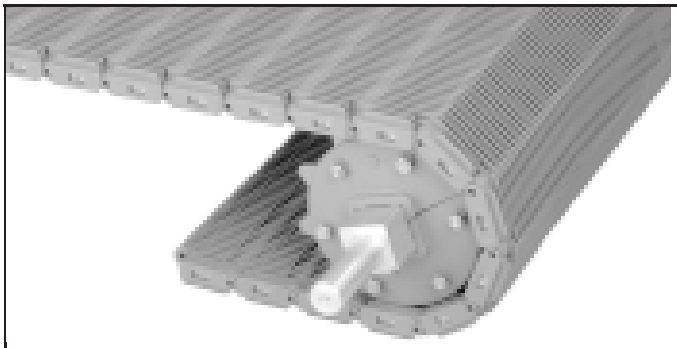
S Strength Factor

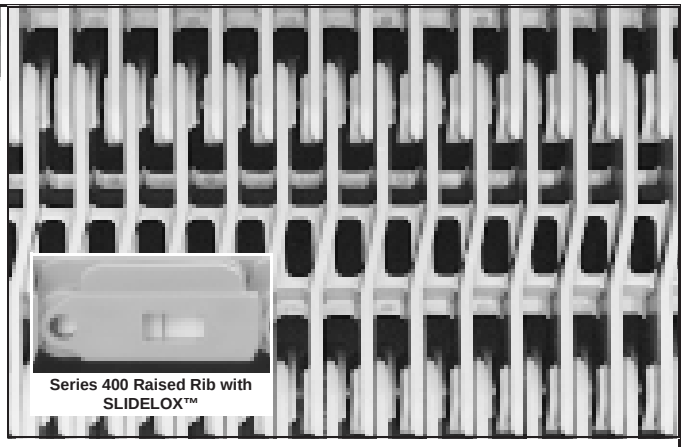


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 400** is on pages 2-28 to 2-30.
- **Series 400 Flush Grid** is available with SLIDELOX™ rod retention for belts 6.0 ft. (1829 mm) wide and wider. All **Series 400 Flush Grid** with Abrasion Resistant rods are available with SLIDELOX™ rod retention. All other **Series 400 Flush Grid** belts use the standard headed rods.
- **Series 400 Flush Grid in Acetal and EC Acetal** must be used with the 9 or 13 tooth split sprockets only.

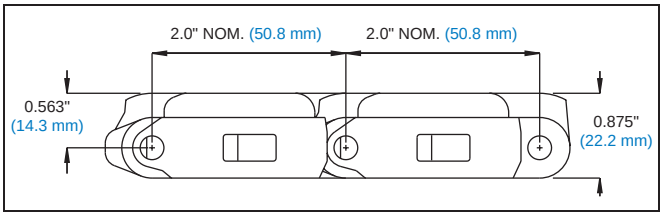




RAISED RIB

26% Open Area (straight through)
36% Product Contact Area

- Opening size: (approximate) 0.25 in. (6.4 mm) x 0.24 in. (6.1 mm).
- Nominal 2.0 in. (50.8 mm) pitch, closed hinge, centre-driven with fully flush edges.
- Highest strength rating of all Intralox belts (along with **Series 400 Flush Grid** and **Flat Top**).
- Raised Ribs extend 0.25 in. (6.4 mm) above basic module. Use with Finger Transfer Plates to virtually eliminate tippage at in-feed and discharge.
- Custom-built in widths from 2 in. (50.8 mm) and up for polyethylene and 3 in. (76,2 mm) and up for polypropylene, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	2400 (3570)	34 (1) to 220 (104)	1.95 (9.52)	•		
Polyethylene	Polyethylene	1800 (2680)	-100 (-73) to 150 (66)	1.98 (9.67)	•		

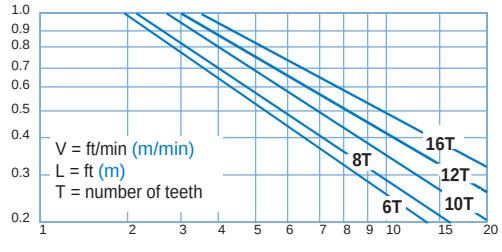
* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

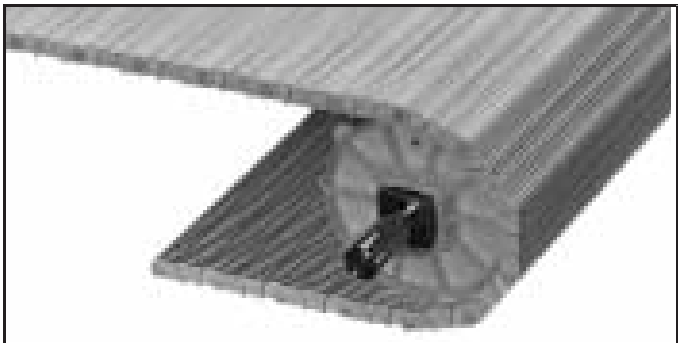
S Strength Factor

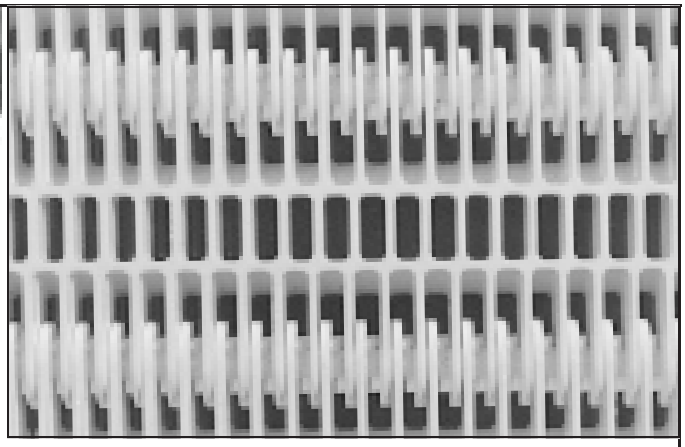


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 400** is on pages 2-28 to 2-30.
- All **Series 400 Raised Rib** polypropylene belts use the SLIDELOX™ rod retention system. **Series 400 Raised Rib** polyethylene belts use the standard headed rods.

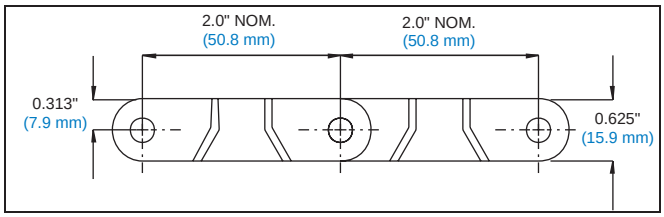




OPEN HINGE

30% Open Area (straight through)
40% Product Contact Area
USDA accepted (Meat and Poultry)

- Opening size: (approximate) 0.47 in. (11.9 mm) x 0.18 in. (4.6 mm).
- Nominal 2.0 in. (50.8 mm) pitch, centre-driven, exposed hinge rods.
- Shares heavy duty rating with other belts in this series.
- Large, open area improves air flow, drainage and cleanability.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.25 in. (6.4 mm) increments. (See ***Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	Agriculture Canada
Polypropylene*	Polypropylene	1550 (2300)	34 (1) to 220 (104)	1.16 (5.66)	•	•	•
Polyethylene	Polyethylene	950 (1400)	-50 (-46) to 150 (66)	1.24 (6.06)	•	•	•

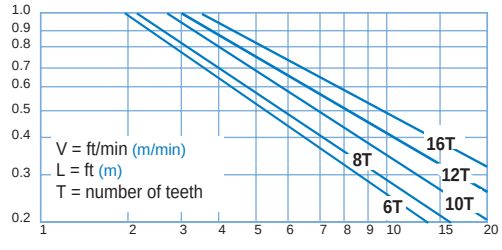
* Do not use PP in high impact conditions below 7°C.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

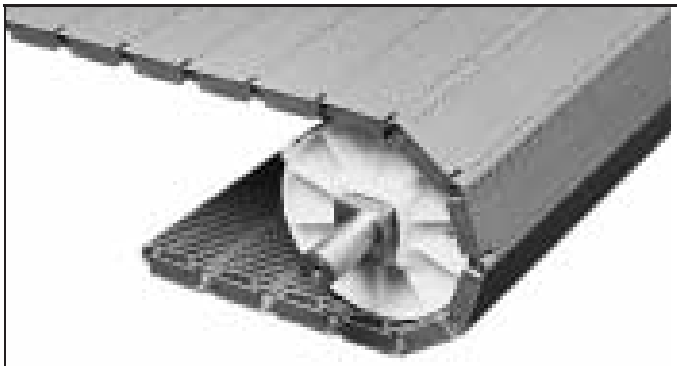
S Strength Factor

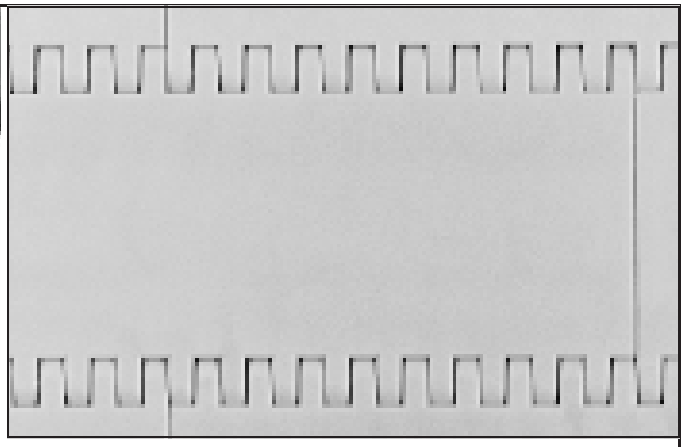


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

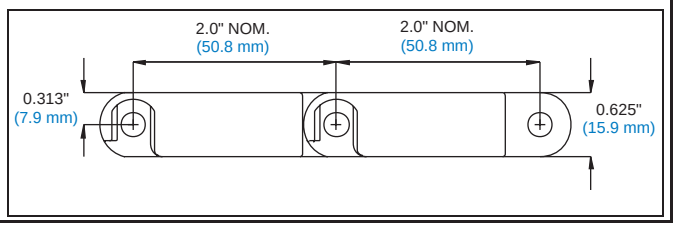
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 400** is on pages 2-28 to 2-30.
- **Series 400 Open Hinge** has double-headed hinge rods so the belt edge is not fully flush.





FLAT TOP, 0% Open Area

- Nominal 2.0 in. (50.8 mm) pitch, closed hinge, centre-driven with smooth, closed surfaces.
- Highest strength rating of all Intralox belts (along with **Series 400 Raised Rib** and **Flush Grid**). Smooth upper surface and straightforward design provides free product movement.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	2400 (3570)	34 (1) to 220 (104)	1.81 (8.82)	•		
Polyethylene	Polyethylene	1800 (2680)	-100 (-73) to 150 (66)	1.90 (9.28)	•		
Acetal	Polypropylene	3200 (4760)	34 (1) to 200 (93)	2.74 (13.38)	•		
EC Acetal	Polypropylene	2400 (3570)	34 (1) to 200 (93)	2.74 (13.38)			
Acetal**	Polyethylene	3000 (4460)	-50 (-46) to 70 (41)	2.74 (13.38)	•		

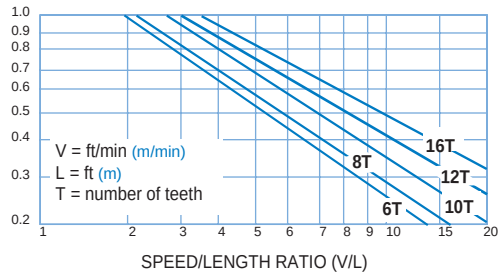
* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
EC Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.19 (0.20)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

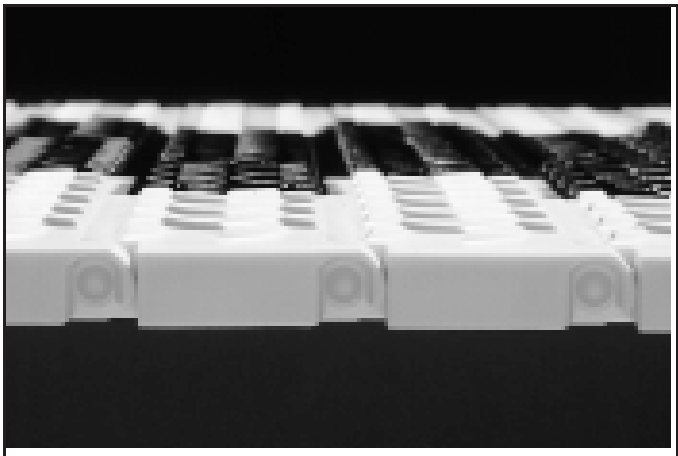
S Strength Factor

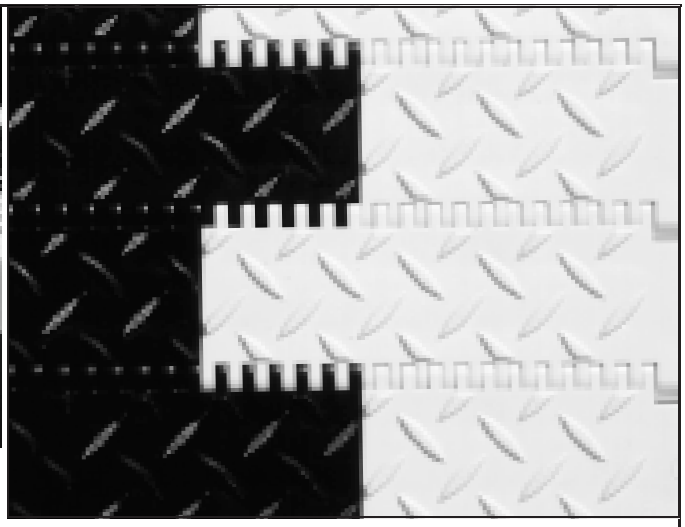


Divide belt speed "V" by the shaft distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

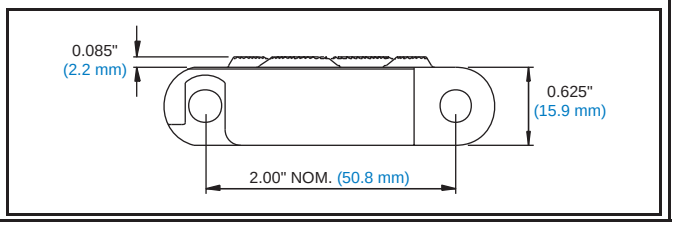
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 400** is on pages 2-28 to 2-30.
- For an alternative to **Series 400 Flat Top**, see **Series 800 Flat Top** (USDA accepted, page 2-33) and **Series 1400 Flat Top** (page 2-69).
- It is recommended that **Abrasion Resistant Split Sprockets** be used with **Series 400 Flat Top in Acetal**.
- **Series 400 Flat Top** is available with SLIDELOX™ rod retention for belts 6 feet (1829 mm) wide and wider. All **Series 400 Flat Top** with Abrasion Resistant Rods are available with SLIDELOX™ Rod Retention. All other **Series 400 Flat Top** belts use the standard headed rods.





NON SKID, 0% Open Area

- Nominal 2.0 in. (50.8 mm) pitch, closed hinge, centre-driven with smooth, closed surfaces.
- Among highest strength rating of all Intralox belts.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments.



Belt Data

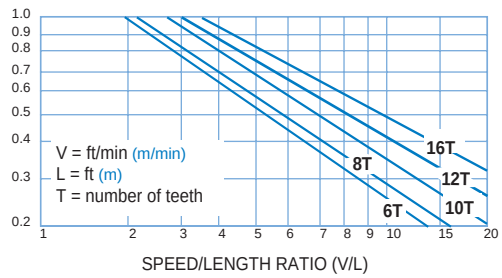
Belt Material	Standard Rod Material ∅ 0.24 in (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)
Acetal	Polypropylene	3200 (4760)	-50 (-46) to 200 (93)	2.88 (14.09)	•
EC Acetal	Polypropylene	2400 (3570)	-50 (-46) to 200 (93)	2.88 (14.09)	

Friction Factors

	F_w Friction between wearstrip and belt Wearstrip material			
Belt Material	**UHMW** WET (DRY)	**HDPE** WET (DRY)	**NYLATRON** WET (DRY)	**STEEL (CS & SS)** WET (DRY)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)
EC Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions.

S Strength Factor



Divide belt speed "V" by the shaft distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 400** is on pages 2-28 to 2-30.

Intralox has moulded and split sprockets for **Series 400** with 6, 8, 10, 12, and 16 teeth. Split sprockets for Flush Grid acetal belts only are available in 9 and 13 tooth sizes. Intralox can machine sprockets (both plastic and split) with different numbers of teeth if the application cannot use the standard sizes. The standard sprockets dimensions are listed in Table A. Shaft information is listed in Table B.

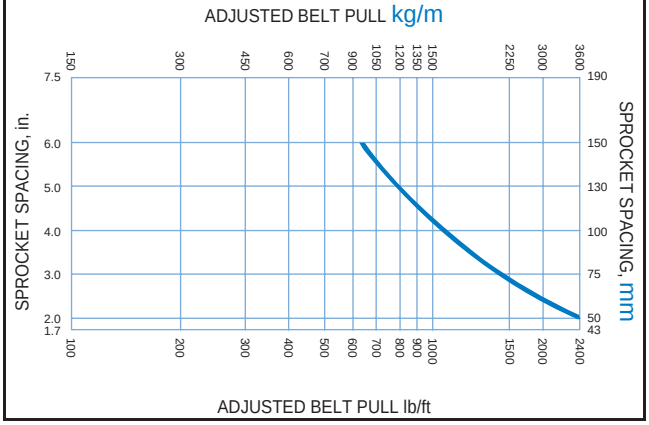
The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

SPROCKET AND SUPPORT QUANTITY REFERENCE

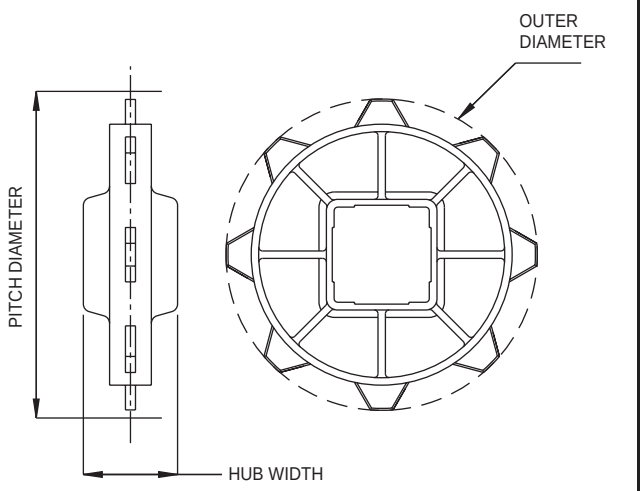
Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
2 (50.8)	1	2	2
4 (102)	1	2	2
6 (152)	2	2	2
7 (178)	2	2	2
8 (203)	2	2	2
10 (254)	2	3	2
12 (305)	3	3	2
14 (356)	3	3	3
15 (381)	3	3	3
16 (406)	3	3	3
18 (457)	3	3	3
20 (508)	5	4	3
24 (610)	5	4	3
30 (762)	5	5	4
32 (813)	7	5	4
36 (914)	7	5	4
42 (1067)	7	6	5
48 (1219)	9	7	5
54 (1372)	9	7	6
60 (1524)	11	8	6
72 (1829)	13	9	7
84 (2134)	15	11	8
96 (2438)	17	12	9
120 (3048)	21	15	11
144 (3658)	25	17	13
For Other Widths, Use Odd Number of Sprockets** at Maximum 6 in. (152 mm) ℄ Spacing		Maximum 9 in. (229 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

*__NOTE__: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications.
** The centre sprocket should be locked down. With only two sprockets, fix the sprocket on the drive journal side only.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



SERIES 400 MOULDED 8 TOOTH SPROCKET



A — SPROCKET DATA

No. of Teeth (Chordal Action)	NOM. Pitch Dia. in. (mm)	NOM. Outer Dia. in. (mm)	NOM. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.*	Square in.	Round (mm)*	Square (mm)
MOULDED SPROCKETS							
6 (13.40%)	4.0 (102)	3.6 (91)	1.5 (38)		1.5		(40)
8 (4.05%)	5.2 (132)	5.0 (127)	1.5 (38)		1.5		(40)
					2.5		(60)
10 (4.05%)	6.4 (163)	6.3 (160)	1.5 (38)	2.0	1.5		(40)
					2.5		(60)
12 (4.05%)	7.8 (198)	7.7 (196)	1.5 (38)		1.5		(40)
					2.5		(60)
16 (1.36%)	10.1 (257)	10.2 (259)	1.5 (38)		1.5		(40)
					2.5		(60)
					3.5		(90)

* Round bore sprockets do not have set screws for locking the sprockets in place. As with square bore sprockets, only the centre-most sprocket needs to be locked down. Key sizes on round bore sprockets conform to ANSI standard B17.I-1967, R1989 and DIN 6885.

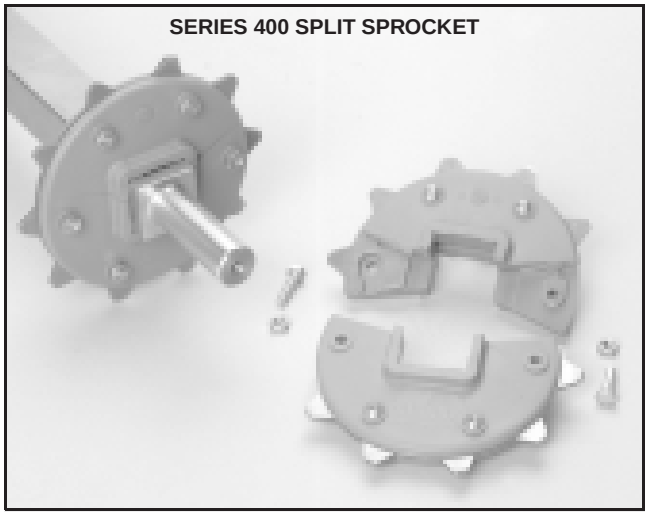
Call Customer Service for lead-times.

A — SPROCKET DATA (Continued)							
No. of Teeth (Chordal Action)	NOM. Pitch Dia. in. (mm)	NOM. Outer Dia. in. (mm)	NOM. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.*	Square in.	Round (mm)*	Square (mm)
SPLIT SPROCKETS For all belts except Flush Grid Acetal.							
6 (13.40%)	4.0 (102)	3.6 (91)	1.5 (38)		1.5		(40)
8 (7.61%)	5.2 (132)	5.0 (127)	1.5 (38)		1.5		(40)
					2.5		(60)
10 (4.89%)	6.4 (163)	6.3 (160)	1.5 (38)		1.5		(40)
					2.5		(60)
12 (3.41%)	7.8 (198)	7.7 (196)	1.5 (38)		1.5		(40)
					2.5		(60)
16 (1.92%)	10.1 (257)	10.2 (259)	1.5 (38)	3.5	1.5		(40)
					2.5		(60)
					3.5		(90)
SPLIT SPROCKETS For Flush Grid Acetal only.							
9 (6.03%)	5.8 (147)	5.9 (150)	1.5 (38)		1.5		(40)
					2.5		(60)
13 (2.91%)	8.4 (213)	8.5 (216)	1.5 (38)		1.5		(40)
					2.5		(60)
* Round bore sprockets do not have set screws for locking the sprockets in place. As with square bore sprockets, only the centre-most sprocket needs to be locked down. Key sizes on round bore sprockets conform to ANSI standard B17.I-1967, R1989 and DIN 6885.							
Call Customer Service for lead-times.							

Split sprockets are constructed of a 304 stainless steel tooth bearing plate sandwiched between bore specific, polypropylene hubs. For acid applications, the plate may be made of 316 stainless steel. Stainless steel teeth are generally more abrasion resistant than plastic teeth, thus increasing normal sprocket life. Split sprockets are constructed of FDA compliant materials, but are not USDA accepted for food contact applications.

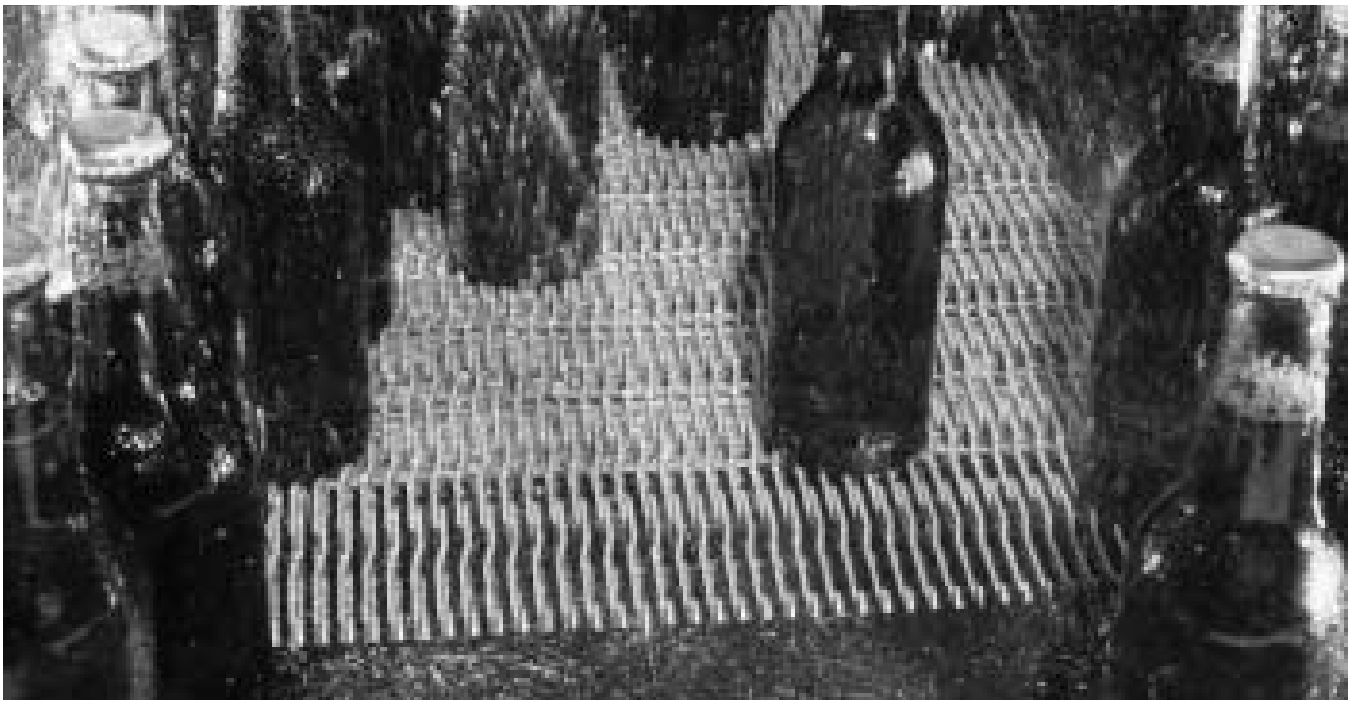
Installing or removing split sprockets (sub-assembled by Intralox) is accomplished using only two bolts. On new equipment, shafts can be mounted and plumbed before sprocket installation. On existing equipment, sprockets may be replaced without removing the shafts. Split sprockets and moulded sprockets can be used together on the same shaft.

SERIES 400 SPLIT SPROCKET



B — SHAFT DATA				
SIZE	Q SHAFT WEIGHT, lb/ft (kg/m)			I MOMENT OF INERTIA in.^{4} (mm^4)
	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	3.40* (5.06)	0.42 (175,600)
2.5 IN. SQUARE	7.34* (10.92)	21.25* (31.62)	7.65* (11.38)	0.42 (175,600)
3.5 IN. SQUARE	14.39 (21.41)	41.60* (61.91)	41.60* (61.91)	3.25 (1,355,000)
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213.300) 0.51
60 mm SQUARE	(10.05) 6.75	(29.11)** 19.56	(29.11)** 19.56	(1,080,000) 2.78
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

* Intralox USA offers square shafting in these materials and sizes.
** Intralox Europe offers square shafting in these materials and size



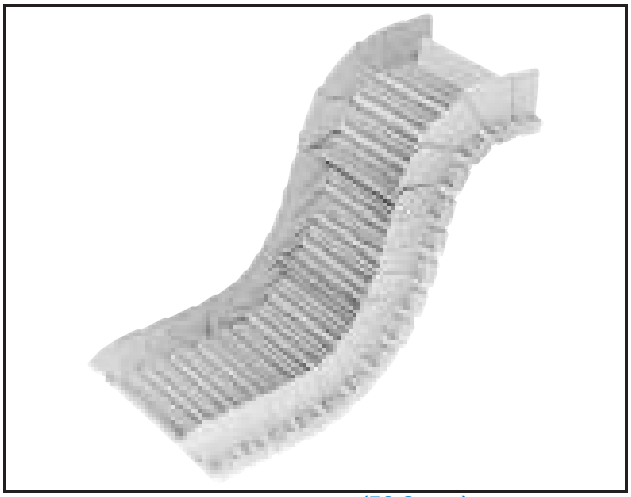
BELT ACCESSORIES

FLIGHTS — Intralox has flights available with Flush Grid, Open Hinge and Flat Top base modules. Flush Grid and Open Hinge Streamline/No-Cling Flights are available in 1 in. (25 mm), 2 in. (51 mm) and 3 in. (76 mm) heights, and Flat Top Streamline Flights are available in 4 in. (102 mm) and 6 in. (152 mm) heights. Each flight rises out of the centre of its supporting module, moulded as an integral part, with no fasteners required. Flush Grid and Open Hinge flights have two sides: one side is smooth (Streamline), while the other side is ribbed vertically (No-Cling). Flights can be provided in linear increments of 2 in. (51 mm) and extended in height to 6 in. (152 mm). Welded bent flights are also available. The minimum indent on Flush Grid and Flat Top flights (without sideguards) is 0.8 in. (20 mm). On Open Hinge flights the minimum indent (without sideguards) is 0.60 in. (15 mm).

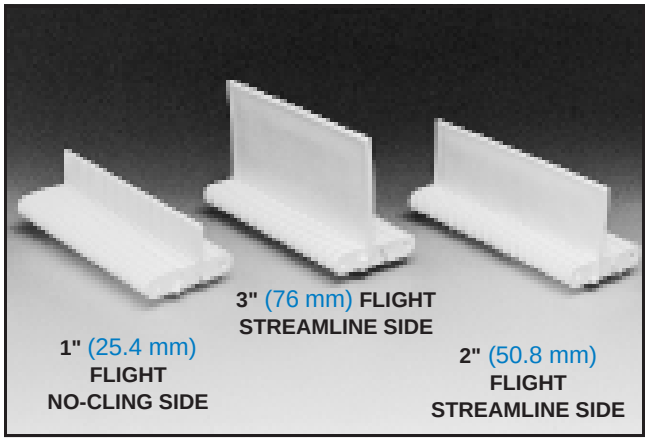
NOTE: Flat Top-based flights cannot be used with Flush Grid belts.

SERIES 400 ACCESSORIES (Nominal Dimensions)		
Flush Grid Base Flights	**Open Hinge Base Flights**	**Flat Top Base Flights**
1 in. (25 mm) 2 in. (51 mm) 3 in. (76 mm)	1 in. (25 mm) 2 in. (51 mm) 3 in. (76 mm)	4 in. (102 mm) 6 in. (152 mm)
AVAILABLE MATERIALS		
Polypropylene Polyethylene	Polypropylene* Polyethylene	Polypropylene Polyethylene Acetal
Series 400 Flush Grid and Open Hinge flights can be extended to 6 in. (152 mm) high (welded extension). The extension can also be welded at a 45° angle for a bent flight.		

*Contact Intralox Customer Service for availability and lead-times.



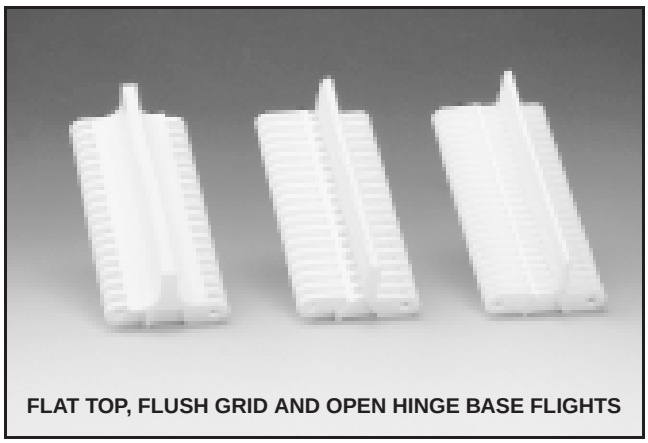
SERIES 400 FLUSH GRID BELT, 2" (50.8 mm) NO-CLING FLIGHTS, 3" (76 mm) SIDEGUARDS



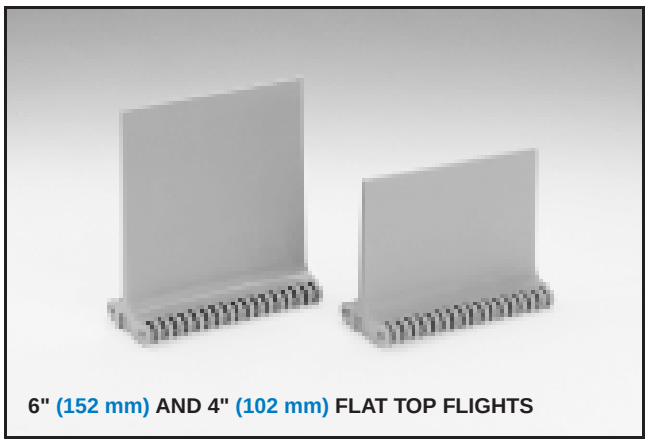
3" (76 mm) FLIGHT STREAMLINE SIDE

1" (25.4 mm) FLIGHT NO-CLING SIDE

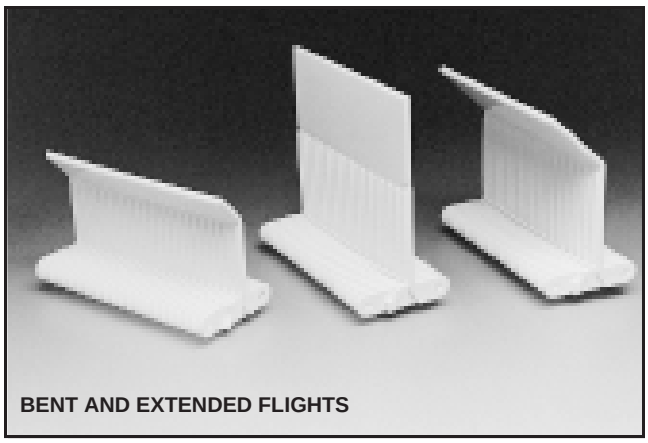
2" (50.8 mm) FLIGHT STREAMLINE SIDE



FLAT TOP, FLUSH GRID AND OPEN HINGE BASE FLIGHTS



6" (152 mm) AND 4" (102 mm) FLAT TOP FLIGHTS



BENT AND EXTENDED FLIGHTS

SIDEGUARDS — Sideguards, used with Flush Grid, Open Hinge and Flat Top belts to assure product containment, are available in 2 in. (51 mm), 3 in. (76 mm) and 4 in. (102 mm) heights. They are of the standard overlapping design and are an integral part of the belt, fastened by the hinge rods. The minimum indent is 0.8 in. (20 mm). The normal gap between the sideguards and the edge of a flight is 0.4 in. (10 mm). When going around the 6 and 8 tooth sprockets, the sideguards will fan out, opening a gap at the top of the sideguard which might allow small products to fall out. The sideguards stay completely closed when going around the 10, 12 and 16 tooth sprockets.

FINGER TRANSFER PLATES — These comb-like plates are designed for use with Series 400 Raised Rib belts to eliminate transfer and tipping problems. The fingers extend between the ribs of the belt, allowing a smooth continuation of the product flow as the belt engages the sprockets. Intralox offers two styles of Finger Transfer Plates.

The Two-Material Finger Transfer Plates provide high strength fingers combined with a low friction back plate. The low-friction back plate is permanently attached to the two high-strength finger inserts. The Two-Material Finger Transfer Plates are available in three different configurations:

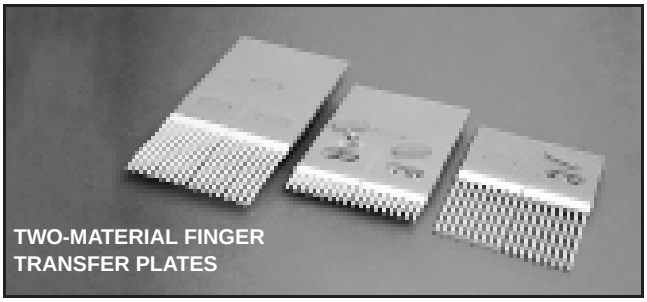
Standard - long fingers with a short back plate

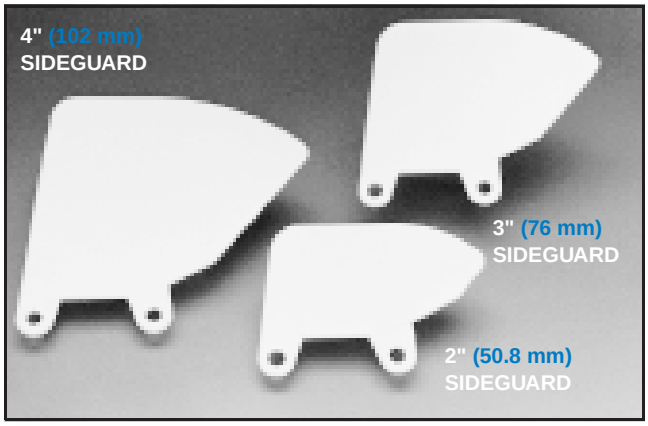
Standard Extended Back - long fingers with an extended back plate

Glass Handling - short fingers with an extended back plate

The long fingers provide good support for unstable products like PET containers and cans. The short fingers are sturdy enough for even the harshest broken glass applications. These fingers are designed to resist breaking, but if confronted with deeply embedded glass, the individual fingers will yield and break off, preventing costly belt or frame damage. The short back plate has two attachment slots and the extended back plate has three attachment slots. Mounting hardware for the two standard two-material FTP's includes plastic shoulder bolts and bolt covers. Mounting hardware for the Glass Handling two-material FTP's includes stainless steel oval washers and bolts which gives more secure fastening for the tough glass applications. Plastic bolt covers are also included. The 10.1" (257 mm) PD, 16 tooth sprockets are recommended to be used with the Glass Handling finger transfer plates for best product transfer.

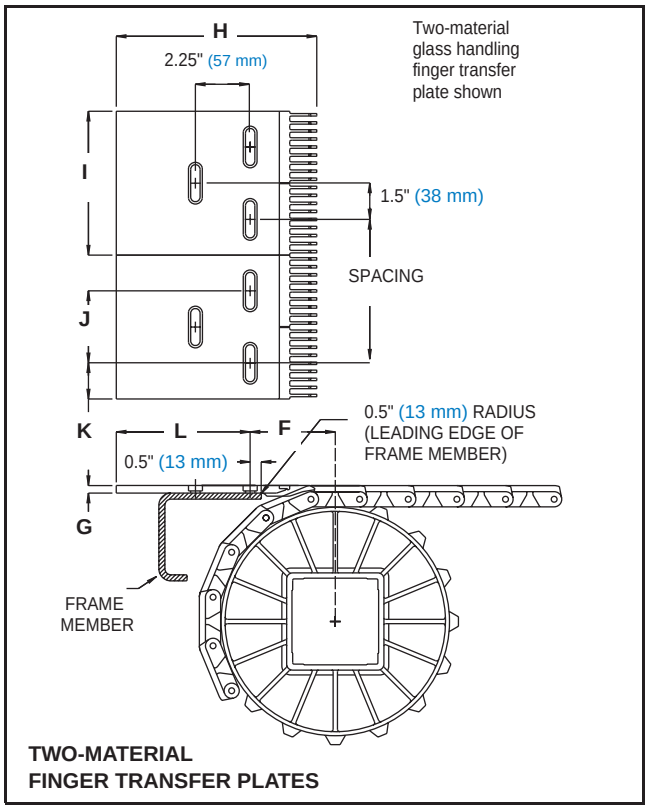
Intralox also offers a single-material polypropylene standard finger transfer plate for better chemical resistance. Mounting hardware for this FTP includes plastic shoulder bolts and snap-cap bolt covers.





SERIES 400 ACCESSORIES (Nominal Dimensions)		
Sideguards	**Single Material Finger Transfer Plates**	**Two-Material Finger Transfer Plates**
2 in. (51 mm) 3 in. (76 mm) 4 in. (102 mm)	6 in. (152 mm) 18 Fingers	6 in. (152 mm) 18 Fingers
AVAILABLE MATERIALS		
Polypropylene Polyethylene	Polypropylene*	Glass-Filled Thermoplastic Fingers Acetal Backplate

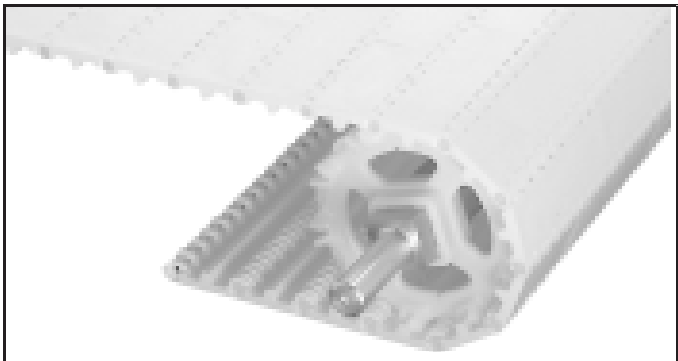
*Contact Intralox Customer Service for availability and lead-times.

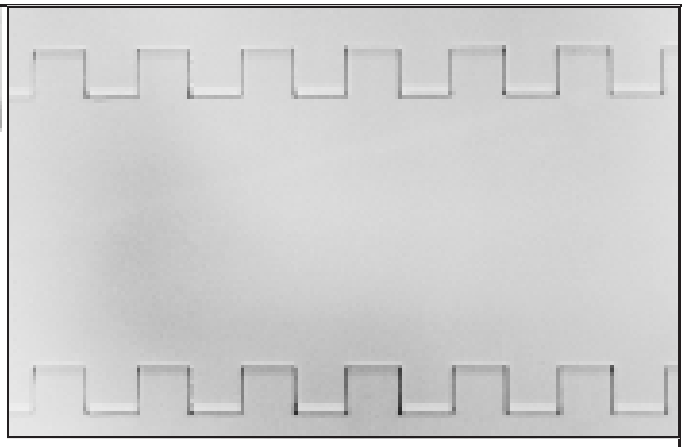


TWO-MATERIAL
FINGER TRANSFER PLATES

DIMENSIONAL REQUIREMENTS FOR SERIES 400 FINGER TRANSFER PLATE INSTALLATION					
	TWO-MATERIAL			SINGLE MATERIAL	
	Standard FTP in. (mm)	Standard *EXTENDED BACK* FTP in. (mm)	GLASS HANDLING FTP in. (mm)	Standard FTP in. (mm)	
F	3.50 (89)	3.50 (89)	3.50 (89)	3.50 (89)	
G	0.31 (8)	0.31 (8)	0.31 (8)	0.31 (8)	
H	7.25 (184)	10.75 (273)	8.26 (210)	7.50 (191)	
I	5.91 (150)	5.91 (150)	5.91 (150)	5.92 (150)	
J	3.00 (76)	3.00 (76)	3.00 (76)	3.00 (76)	
K	1.45 (37)	1.45 (37)	1.45 (37)	1.45 (37)	
L	2.00 (50.8)	5.50 (140)	5.50 (140)	2.00 (50.)	
Spacing at ambient temperature	PP 5.952 (151.2)	PE 5.952 (151.2)	PP 5.952 (151.2)	PP 5.952 (151.2)	PE 5.952 (151.2)

NOTES



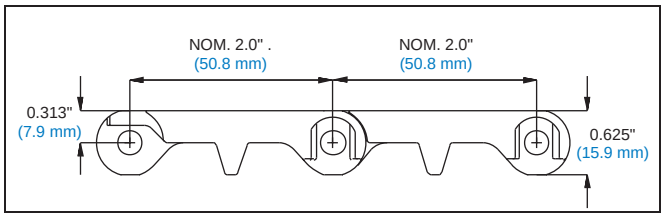


FLAT TOP, 0% Open Area

USDA accepted (Meat and Poultry, and Dairy)

- Nominal 2.0 in. (50.8 mm) pitch, centre-driven, open hinge.
- Smooth, closed upper surface with fully flush edges and recessed rods.
- Impact resistant belt designed for tough Meat Industry applications.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.66 in. (16.8 mm) increments.

(See Important NOTE on page 1-8)



800

Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength* lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability						
					FDA (USA)	USDA-Meat and Poultry	USDA** Dairy	Agriculture Canada	A[1]	Z[2]	M[3]
Polypropylene***	Polypropylene	1000 (1490)	34 (1) to 220 (104)	1.77 (8.66)	•	•	White	•	•	•	•
Polyethylene	Polyethylene	500 (750)	-50 (-46) to 150 (66)	1.87 (9.13)	•	•	Natural	•	•	•	•
Acetal	Polyethylene	900 (1340)	-50 (-46) to 150 (66)	2.75 (13.43)	•	•	White	•	•	•	•
IR Nylon	Polyethylene	1200 (1780)	-50 (-46) to 180 (82)	2.32 (11.33)	•	•		•	•	•	•

* When using Polyurethane sprockets, the Belt Strength for Polypropylene, Acetal and IR Nylon is 750 lbs/ft (1120 kg/m), and the temperature range is 0 °F (-18 °C) to 120 °F (49 °C). Contact Customer Service for availability of Polyurethane sprockets.
** USDA Dairy and MAF acceptance require the use of a clean-in-place system.
*** Do not use PP in high impact conditions below 7°C.

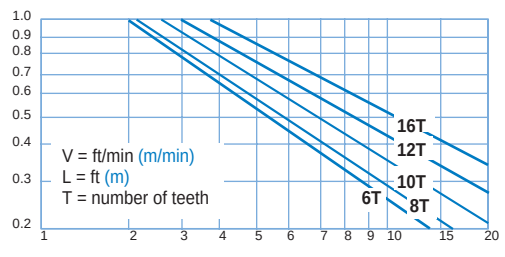
[1] Australian Quarantine Inspection Service. [2] New Zealand Ministry of Agriculture and Fisheries. [3] M - MAF - New Zealand Dairy.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
IR Nylon	— (0.16)	— (0.17)	—	— (0.16)	— (0.23)	— (0.16)	0.13 (0.16)	— (0.20)	— (0.28)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

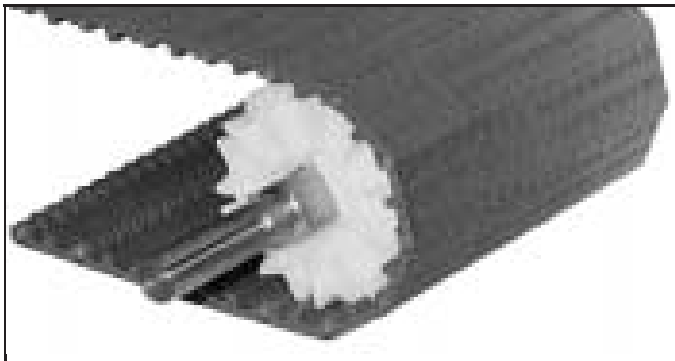


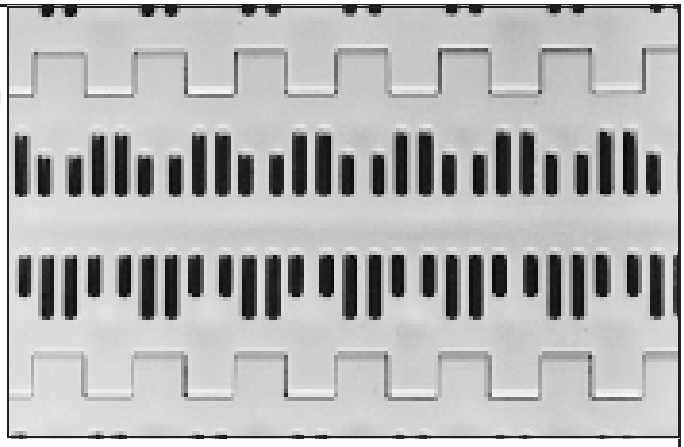
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 800** is on pages 2-40 to 2-42.
- Impact Resistant Nylon can be used in low moisture environments with high impact requirements. See page 2-2 for more information.



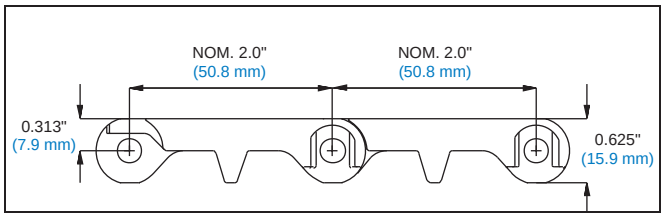


PERFORATED FLAT TOP, 18% Open Area

USDA accepted (Meat and Poultry, and Dairy)

- Minimum opening size (approximate): 0.29 in. (7.4 mm) x 0.08 in. (1.9 mm).
- Maximum opening size (approximate): 0.44 in. (11.1 mm) x 0.08 in. (1.9 mm).
- Nominal 2.0 in. (50.8 mm) pitch, centre-driven, open hinge.
- Perforated version of Series 800 Flat Top.
- Smooth upper surface with fully flush edges and recessed rods.
- Flights and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.66 in. (16.8 mm) increments.

(See Important NOTE on page 1-8)



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength* lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	USDA** Dairy
Polypropylene***	Polypropylene	1000 (1490)	34 (1) to 220 (104)	1.54 (7.52)	•	•	White
Polyethylene	Polyethylene	500 (750)	-50 (-46) to 150 (66)	1.59 (7.76)	•	•	Natural
Acetal	Polyethylene	900 (1340)	-50 (-46) to 150 (66)	2.28 (11.15)	•	•	White

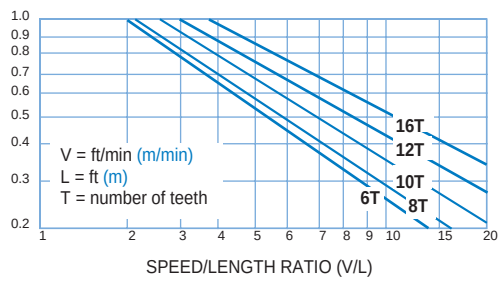
* When using Polyurethane sprockets, the Belt Strength for Polypropylene, Acetal and IR Nylon is 750 lbs/ft (1120 kg/m), and the temperature range is 0 °F (-18 °C) to 120 °F (49 °C). Contact Customer Service for availability of Polyurethane sprockets.
** USDA Dairy acceptance requires the use of a clean-in-place system.
*** Do not use PP in high impact conditions below 7°C.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

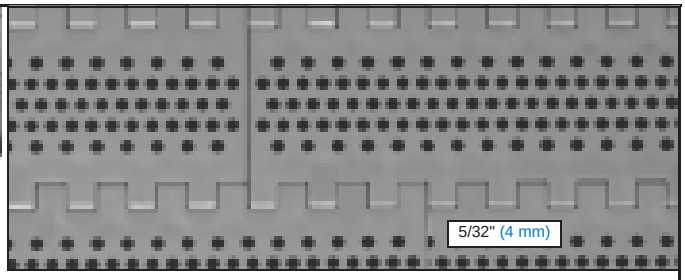


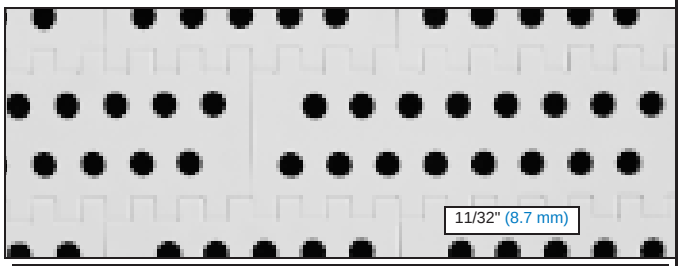
SPEED/LENGTH RATIO (V/L)

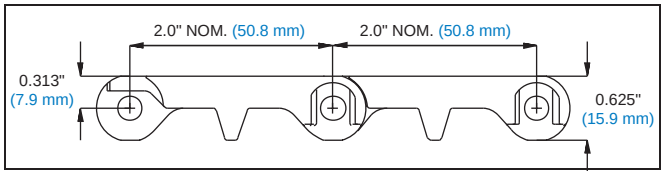
Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 800** is on pages 2-40 to 2-42.







PERFORATED FLAT TOP ROUND HOLES 5/32" (4 mm), with 20% Open Area and 11/32" (8.7 mm) with 14% open area

USDA accepted (Meat and Poultry, and Dairy)

- Nominal 2.0 in. (50.8 mm) pitch, centre-driven, open hinge.
- Round hole version of **Series 800 Perforated Flat Top**.
- Smooth upper surface with fully flush edges and recessed rods.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.66 in. (16.8 mm) increments.

(See Important NOTE on page 1-8)

Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength* lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	USDA** Dairy	M[1]
Polypropylene***	Polypropylene	1000 (1490)	34 (1) to 220 (104)	1.77 (8.66)	•	•	White	•
Polyethylene	Polyethylene	500 (750)	-50 (-46) to 150 (66)	1.87 (9.13)	•	•	Natural	•
Acetal	Polyethylene	900 (1340)	-50 (-46) to 150 (66)	2.28 (11.15)	•	•	White	

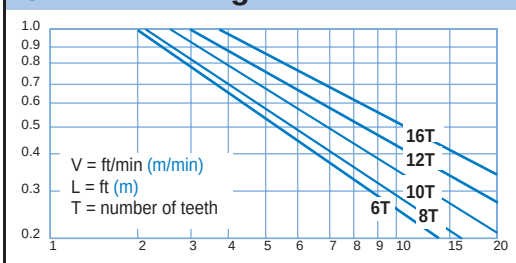
* When using Polyurethane sprockets, the Belt Strength for Polypropylene, Acetal and IR Nylon is 750 lbs/ft (1120 kg/m), and the temperature range is 0 °F (-18 °C) to 120 °F (49 °C). Contact Customer Service for availability of Polyurethane sprockets.
** USDA Dairy and MAF acceptance require the use of a clean-in-place system. [1]M - MAF - New Zealand Dairy.
*** Do not use PP in high impact conditions below 7°C.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

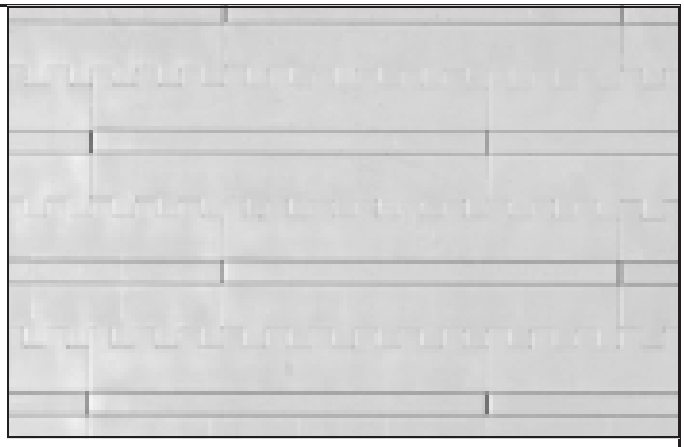


SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

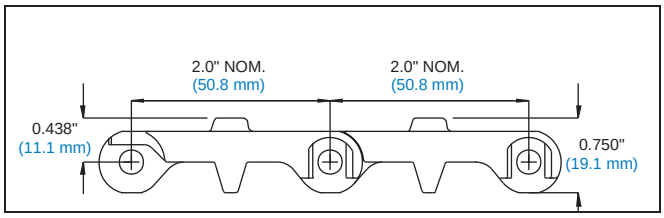
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 800** is on pages 2-40 to 2-42.
- If using this belting in abrasive applications, we recommend **Series 800** polyurethane sprockets. Stainless steel split sprockets are not recommended for use with this belt.



MINI RIB, 0% Open Area
USDA accepted (Meat and Poultry, and Dairy)

- Nominal 2.0 in. (50.8 mm) pitch, centre-driven, open hinge.
- Closed surface with fully flush edges and recessed rods.
- Impact resistant belt designed for tough Meat Industry applications.
- 1/8 in. (3 mm) Mini Rib on surface accommodates gradual inclines and declines.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.66 in (16.8 mm) increments.

(See Important NOTE on page 1-8)



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength* lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	USDA** Dairy	Agriculture Canada	A[1]	Z[2]	M[3]
Polypropylene***	Polypropylene	1000 (1490)	34 (1) to 220 (104)	1.90 (9.23)	•	•	White	•			
Polyethylene	Polyethylene	500 (750)	-50 (-46) to 150 (66)	1.98 (9.67)	•	•	Natural	•			
Acetal	Polyethylene	900 (1340)	-50 (-46) to 150 (66)	2.92 (14.26)	•	•	White	•			

* When using Polyurethane sprockets, the Belt Strength for Polypropylene, Acetal and IR Nylon is 750 lbs/ft (1120 kg/m), and the temperature range is 0 °F (-18 °C) to 120 °F (49 °C). Contact Customer Service for availability of Polyurethane sprockets.
** USDA Dairy and MAF acceptance require the use of a clean-in-place system.
*** Do not use PP in high impact conditions below 7°C.

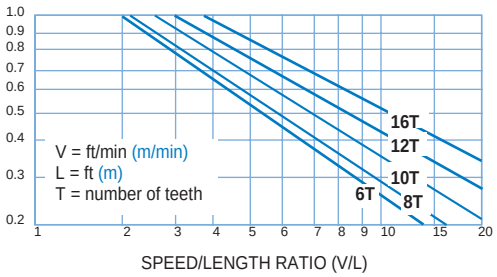
[1] Australian Quarantine Inspection Service. [2] New Zealand Ministry of Agriculture and Fisheries. [3]M-MAF- New Zealand Dairy.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	THESE PRODUCTS ARE NOT RECOMMENDED FOR BACK-UP CONDITIONS. IF VALUES ARE REQUIRED, CONTACT INTRALOX SALES ENGINEERING.				
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)					
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)					
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

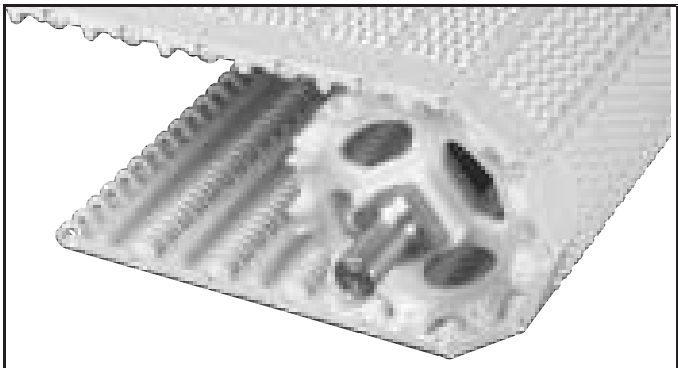


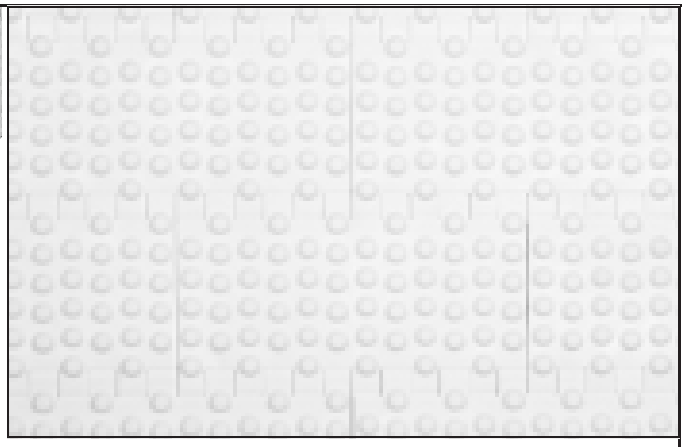
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 800** is on pages 2-40 to 2-42.

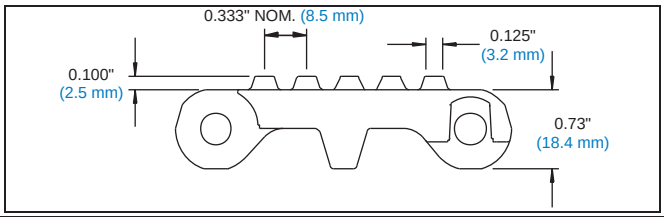




NUB TOP, 0% Open Area
USDA accepted (Meat and Poultry, and Dairy)

- Nominal 2.0 in. (50.8 mm) pitch, centre-driven, open hinge.
- Smooth, closed upper surface with fully flush edges and recessed rods.
- Standard Flights and Sideguards (without nubs) are available.
- Custom-built in nub standard indent is 1.3 inch (33 mm).

(See Important NOTE on page 1-8)



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength* lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability						
					FDA (USA)	USDA-Meat and Poultry	USDA** Dairy	Agriculture Canada	A[1]	Z[2]	M[3]
Polypropylene***	Polypropylene	1000 (1490)	34 (1) to 220 (104)	1.90 (9.23)	•	•	White	•	•	•	
Polyethylene	Polyethylene	500 (750)	-50 (-46) to 150 (66)	2.01 (9.80)	•	•	Natural	•	•	•	
Acetal	Polyethylene	900 (1340)	-50 (-46) to 150 (66)	2.95 (14.40)	•	•	White	•	•	•	

* When using Polyurethane sprockets, the Belt Strength for Polypropylene, Acetal and IR Nylon is 750 lbs/ft (1120 kg/m), and the temperature range is 0 °F (-18 °C) to 120 °F (49 °C). Contact Customer Service for availability of Polyurethane sprockets.
** USDA Dairy and MAF acceptance require the use of a clean-in-place system.
*** Do not use PP in high impact conditions below 7°C.

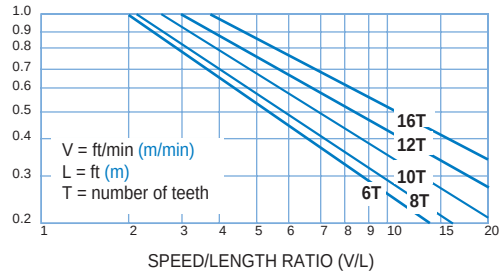
[1] Australian Quarantine Inspection Service. [2] New Zealand Ministry of Agriculture and Fisheries. [3] M-MAF- New Zealand Dairy.

Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	THESE PRODUCTS ARE NOT RECOMMENDED FOR BACK-UP CONDITIONS. IF VALUES ARE REQUIRED, CONTACT INTRALOX SALES ENGINEERING.				
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)					
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)					
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

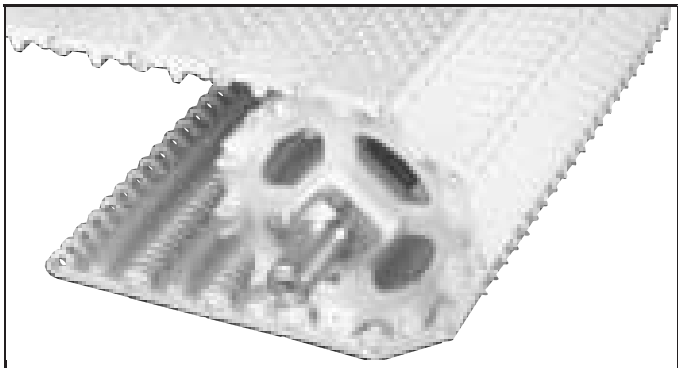
S Strength Factor

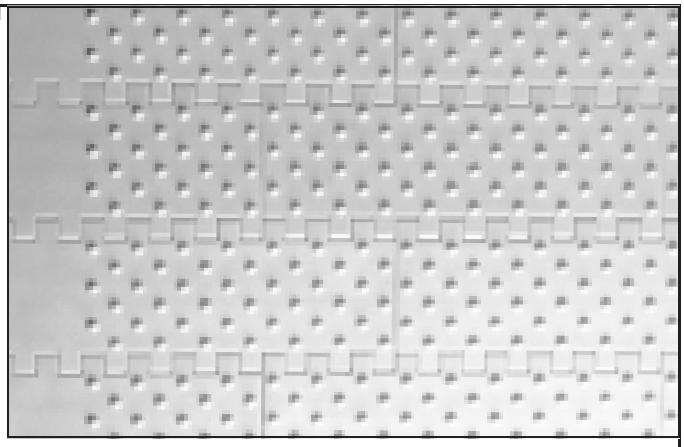


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 800** is on pages 2-40 to 2-42.



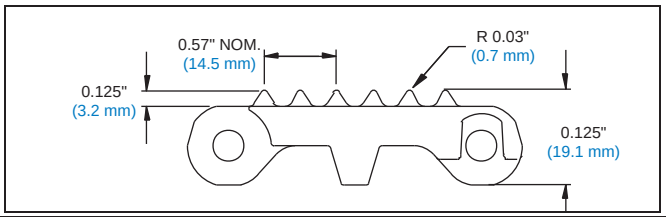


CONE TOP, 0% Open Area

USDA accepted (Meat and Poultry, and Dairy)

- Nominal 2.0 in. (50.8 mm) pitch, centre-driven, open hinge.
- Smooth, closed upper surface with fully flush edges and recessed rods.
- Standard Flights and Sideguards (without cones) are available.
- Custom-built in nub standard indent is 1.3 inch (33 mm).

(See Important NOTE on page 1-8)



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength* lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability						
					FDA (USA)	USDA-Meat and Poultry	USDA** Dairy	Agriculture Canada	A[1]	Z[2]	M[3]
Polypropylene***	Polypropylene	1000 (1490)	34 (1) to 220 (104)	1.84 (8.97)	•	•	White	•	•	•	
Polyethylene	Polyethylene	500 (750)	-50 (-46) to 150 (66)	2.93 (9.44)	•	•	Natural	•	•	•	
Acetal	Polyethylene	900 (1340)	-50 (-46) to 150 (66)	2.84 (13.89)	•	•	White	•	•	•	

* When using Polyurethane sprockets, the Belt Strength for Polypropylene, Acetal and IR Nylon is 750 lbs/ft (1120 kg/m), and the temperature range is 0 °F (-18 °C) to 120 °F (49 °C). Contact Customer Service for availability of Polyurethane sprockets.
** USDA Dairy and MAF acceptance require the use of a clean-in-place system.
*** Do not use PP in high impact conditions below 7°C.

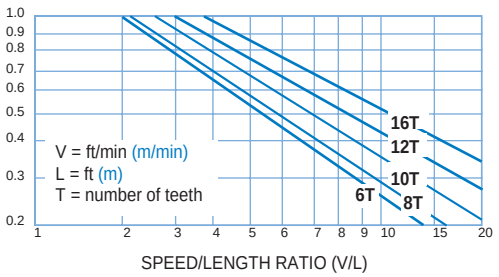
[1] Australian Quarantine Inspection Service. [2] New Zealand Ministry of Agriculture and Fisheries. [3] M-MAF- New Zealand Dairy.

Friction Factors	Fw Friction between wearstrip and belt — Wearstrip material				Fp Friction between product and belt — Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	THESE PRODUCTS ARE NOT RECOMMENDED FOR BACK-UP CONDITIONS. IF VALUES ARE REQUIRED, CONTACT INTRALOX SALES ENGINEERING.				
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)					
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)					
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

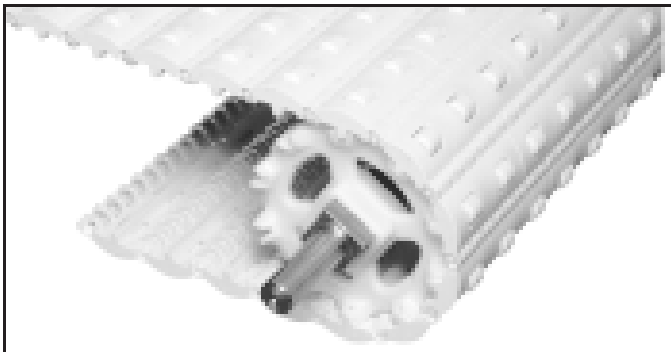
S Strength Factor

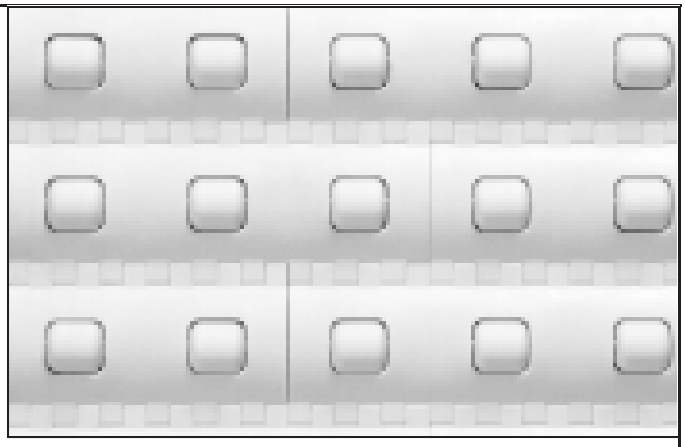


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

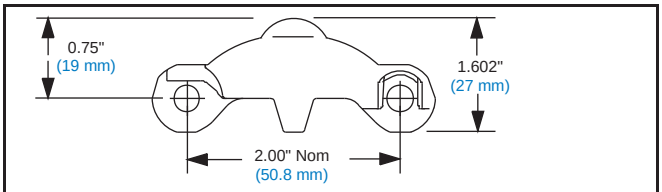
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 800** is on pages 2-40 to 2-42.





Roller Top, 3% Open Area

- Nominal 2.0 in. (50.8 mm) pitch, centre-driven, open hinge.
- Smooth, continuous upper surface with fully flush edges and recessed rods.
- Impact resistant belt designed for tough box and package, low back pressure applications.
- Custom-built in widths from 10 in. (254 mm) and up, in approximately 2.0 in. (50.8 mm) increments.
- **Back-up load is 5-10% of product weight**



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength* lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability						
					FDA (USA)	USDA-Meat and Poultry	USDA** Dairy	Agriculture Canada	A[1]	Z[2]	M[3]
Polypropylene***	Polypropylene	1000 (1490)	34 (1) to 220 (104)	2.93 (14.34)	•	•	White	•	•	•	•
Polyethylene	Polyethylene	500 (750)	-50 (-46) to 150 (66)	2.99 (14.62)	•	•	Natural	•	•	•	•
Acetal	Polypropylene	900 (1340)	-50 (-46) to 150 (66)	4.11 (20.10)	•	•	White	•	•	•	

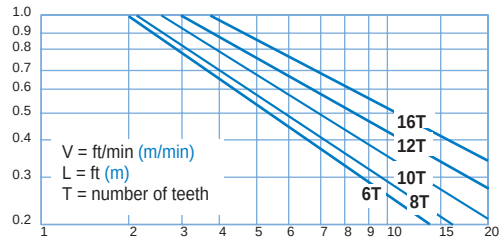
* When using Polyurethane sprockets, the Belt Strength for Polypropylene, Acetal and IR Nylon is 750 lbs/ft (1120 kg/m), and the temperature range is 0 °F (-8 °C) to 120 °F (49 °C). Contact Customer Service for availability of Polyurethane sprockets.
** USDA Dairy and MAF acceptance require the use of a clean-in-place system.
*** Do not use PP in high impact conditions below 7°C.

[1] Australian Quarantine Inspection Service. [2] New Zealand Ministry of Agriculture and Fisheries. [3] M-MAF- New Zealand Dairy.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)					
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	Generally 0.10				
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)					
Polyethylene (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)					
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended.

S Strength Factor



Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 800** is on pages 2-40 to 2-42.

Intralox has moulded and split sprockets for **Series 800** with 6, 8, 10, 12 and 16 teeth. Intralox can machine sprockets (both plastic and split) with different numbers of teeth if the application cannot use the standard sizes. The standard sprocket dimensions are listed in Table A. Shaft information is listed in Table B.

The table SPROCKET AND SUPPORT QUANTITY REFERENCE can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

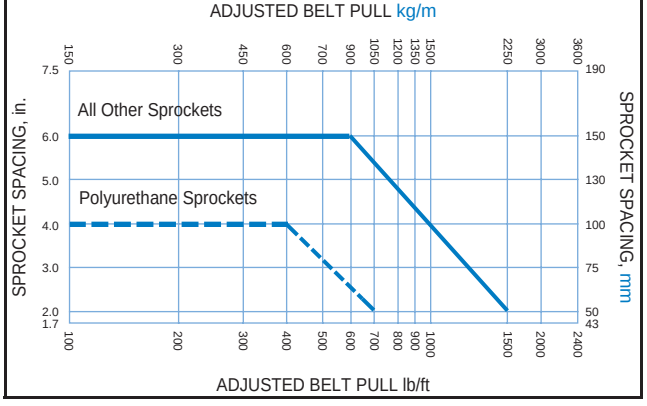
SPROCKET AND SUPPORT QUANTITY REFERENCE

Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
2 (50.8)	1	2	2
4 (102)	1	2	2
6 (152)	2	2	2
8 (203)	2	2	2
10 (254)	2	3	2
12 (305)	3	3	2
14 (356)	3	3	3
16 (406)	3	3	3
18 (457)	3	3	3
20 (508)	5	4	3
24 (610)	5	4	3
30 (762)	5	5	4
32 (813)	7	5	4
36 (914)	7	5	4
42 (1067)	7	6	5
48 (1219)	9	7	5
54 (1372)	9	7	6
60 (1524)	11	8	6
72 (1829)	13	9	7
84 (2134)	15	11	8
96 (2438)	17	12	9
120 (3048)	21	15	11
144 (3658)	25	17	13
For Other Widths, Use Odd Number of Sprockets** at Maximum 6 in. (152 mm) ℄ Spacing		Maximum 9 in. (229 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

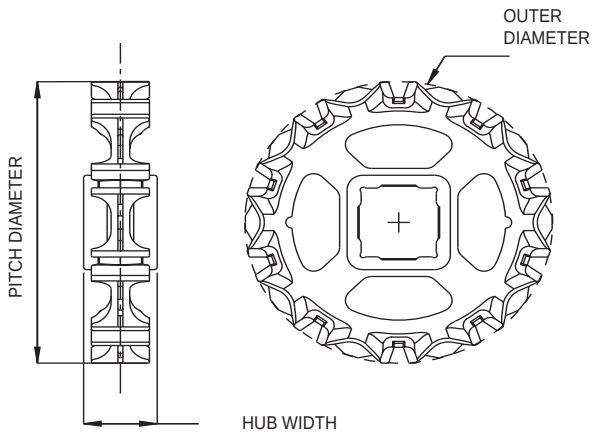
* NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications

** The centre sprocket should be locked down. With only two sprockets, fix the sprocket on the drive journal side only.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



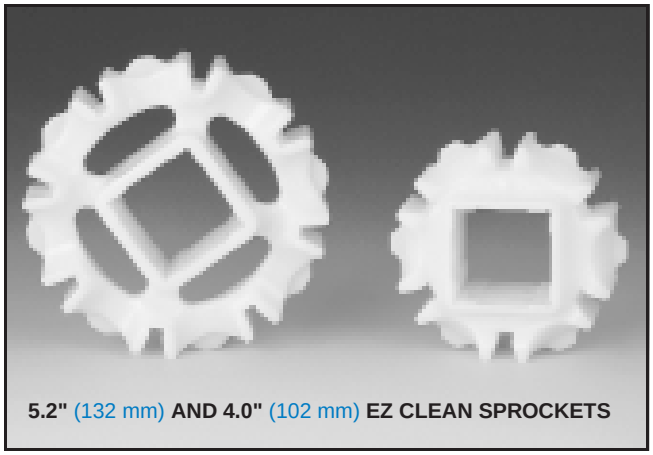
SERIES 800 MOULDED 10 TOOTH SPROCKET



A — SPROCKET DATA

No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.	Square in.	Round (mm)	Square (mm)
EZ CLEAN MOULDED SPROCKETS							
6* (13.40%)	4.0 (102)	3.8 (97)	1.5 (38)		1.0		(40)
8* (7.61%)	5.2 (132)	5.0 (127)	1.5 (38)		1.5		(40)
10* (4.89%)	6.5 (165)	6.2 (157)	1.5 (38)		1.0		(40)
MOULDED SPROCKETS							
8 (7.61%)	5.2 (132)	5.0 (127)	1.5 (38)		1.5		(40)
10 (4.89%)	6.5 (165)	6.2 (157)	1.5 (38)		1.5		(40)
					2.0		
					2.5		(60)
12 (3.41%)	7.7 (196)	7.5 (191)	1.5 (38)		1.5		(60)
					2.5		(40)
16 (1.92%)	10.3 (262)	10.1 (257)	1.5 (38)		1.5		(40)
					1.5		(40)
SPLIT SPROCKETS See next page for Split Sprocket data							
Call Customer Service for lead-times.							

* The 8 and 10 tooth sprockets (5.2 in. [132 mm] and 6.5 in. [165 mm] pitch diameter, respectively) are now available with open "windows" and gradual, sloped surfaces to make them easier to wash down and clean. The 6 tooth sprocket (4.0 in. [102 mm]) has the shaped surfaces for easier cleaning, but because of its small size, no "windows" are included. The redesigned sprockets are available with 1.5 in. and 40 mm square bores. A photo of the 4.0 in. (102 mm) and 5.2 in. (132 mm) pitch diameter sprockets is shown below.



5.2" (132 mm) AND 4.0" (102 mm) EZ CLEAN SPROCKETS

A — SPROCKET DATA (Continued)							
No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.	Square in.	Round (mm)	Square (mm)
ABRASION RESISTANT SPLIT SPROCKETS							
8 (7.61%)	5.2 (132)	5.0 (127)	1.7 (43)		1.5		(40)
					2.5		(60)
10 (4.89%)	6.5 (165)	6.2 (157)	1.7 (43)		1.5		(40)
					2.5		(60)
12 (3.41%)	7.7 (196)	7.5 (191)	1.7 (43)		1.5		(60)
					2.5		(40)
16 1.92%)	10.3 (262)	10.1 (257)	1.7 (43)		1.5		(40)
					2.5		(60)
*Single plate split sprockets are available with a 1.5 in. (38 mm) hub width.							
Call Customer Service for lead-times.							

Split sprockets are constructed of a 304 stainless steel tooth bearing plate sandwiched between bore specific, polypropylene hubs. Two versions are available: the first has a single steel plate; and, the second has three steel plates and can be used for abrasive applications. For acid applications, the plate may be made of 316 stainless steel. Split sprockets are constructed of FDA compliant materials, but are not USDA accepted for food contact applications.

Installing or removing split sprockets (sub-assembled by Intralox) is accomplished using only two bolts. On new equipment, shafts can be mounted and plumbed before sprocket installation. On existing equipment, sprockets may be replaced without removing the shafts. Split sprockets and moulded sprockets can be used together on the same shaft.

B — SHAFT DATA				
SIZE	Q SHAFT WEIGHT, lb/ft (kg/m)			I MOMENT OF INERTIA in.^{4} (mm^4)
	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (11.38)	0.42 (175,600)
2.5 IN. SQUARE	7.34 (10.92)	21.25* (31.62)	21.25* (31.62)	3.25 (1,355,000)
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
60 mm SQUARE	(10.05) 6.75	(29.11)** 19.56	(29.11)** 19.56	(1,080,000) 2.78
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

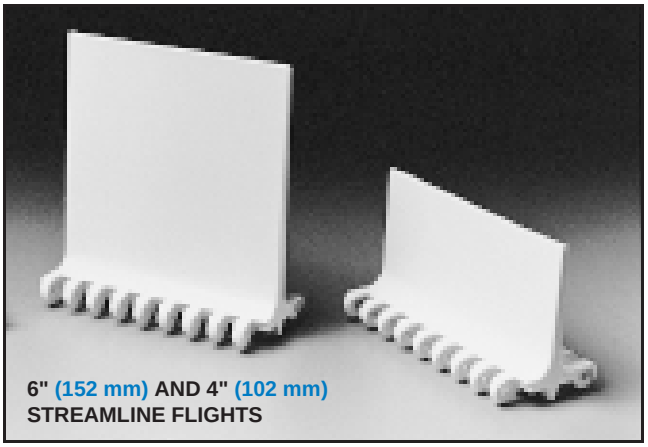
* Intralox USA offers square shafting in these materials and sizes.
** Intralox Europe offers square shafting in these materials and sizes.

BELT ACCESSORIES

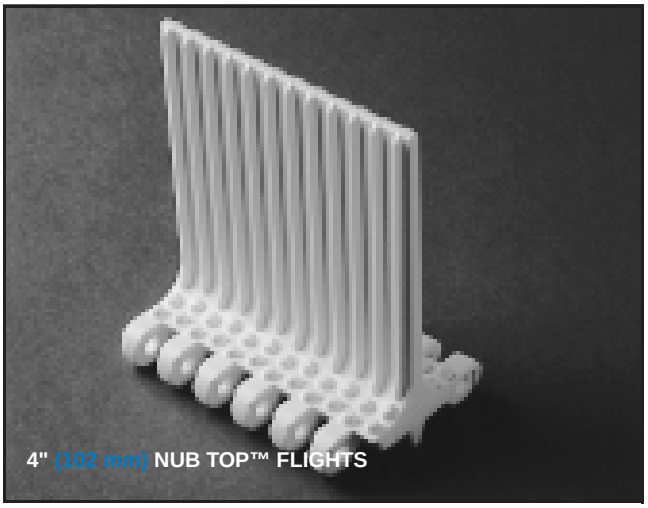
SERIES 800 ACCESSORIES (Nominal Dimensions)					
Streamline Flights*	**No-Cling Flights**	**Scoop Flights****	**Bucket Flights****	**Impact Resistant Flights**	**Sideguards**
1 in. (25 mm) 2 in. (51 mm) 3 in. (76 mm) 4 in. (102 mm) 6 in. (152 mm)	4 in. (102 mm)	3 in. (76 mm) 4 in. (102 mm) 6 in. (152 mm)	2.25 in. (57 mm) 3 in. (76 mm) 4 in. (102 mm) 6 in. (152 mm)	1 in. (25 mm) 2 in. (51 mm)	2 in. (51 mm) 3 in. (76 mm) 4 in. (102 mm)
AVAILABLE MATERIALS					
Polypropylene Polyethylene Acetal IR Nylon	Polypropylene Polyethylene Acetal	Polypropylene Polyethylene Acetal IR Nylon Metal Detectable Polypropylene***	Polypropylene	Acetal	Polypropylene Polyethylene Acetal Metal Detectable Polypropylene***

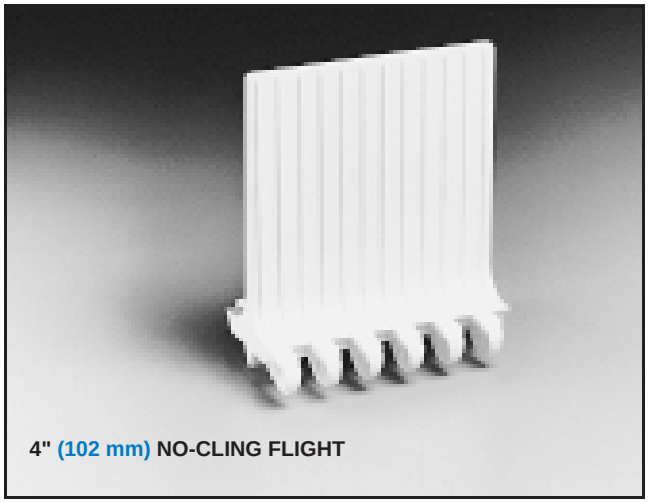
* An extension can be welded at a 45° angle to create a bent flight. Contact Customer Service for availability.
** Contact Customer Service about availability.
*** Metal Detectable Polypropylene can be sensed with metal detection equipment. This material is not USDA accepted, but is FDA compliant.

FLIGHTS — Intralox Streamline Flights are available in 1 in. (25 mm), 2 in. (51 mm), 3 in. (76 mm), 4 in. (102 mm) and 6 in. (152 mm) heights, and can be cut to any height required for a particular application. A 4 in. (102 mm) No-Cling Flight, that can be cut to any height, is available. Impact Resistant Flights are available in heights ranging from 0.5 in. (13 mm) to 4 in. (102 mm), with 1 in. (25 mm) and 2 in. (51 mm) as standard sizes.


6" (152 mm) AND 4" (102 mm) STREAMLINE FLIGHTS


1" (25 mm) AND 2" (50.8 mm) IMPACT RESISTANT FLIGHTS

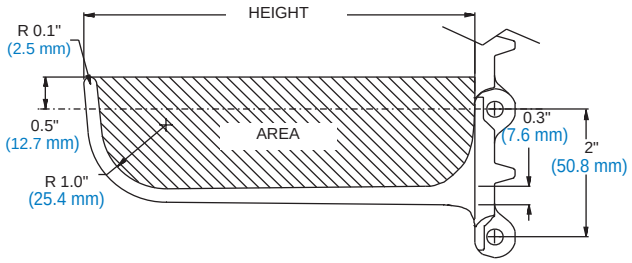

4" (102 mm) NUB TOP™ FLIGHTS


4" (102 mm) NO-CLING FLIGHT

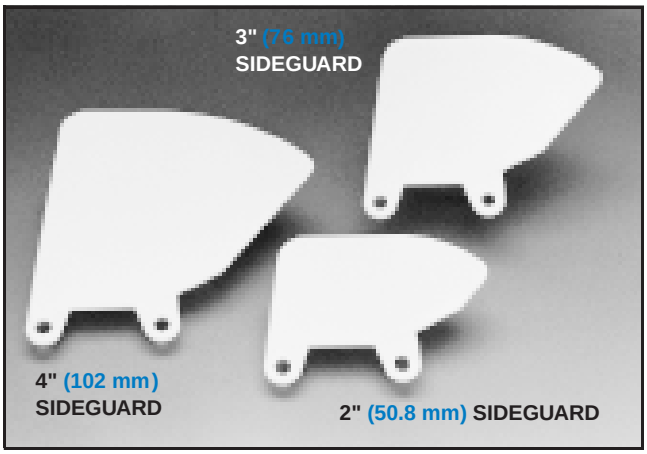
FLIGHTS (CONT.) — Streamline Scoop Flights are available in 3 in. (76 mm), 4 in. (102 mm) and 6 in. (152 mm) heights. The minimum indent (without sideguards) is 1.3 in. (33 mm). Buckets are available: 2.25 in. (57 mm), 3 in. (76 mm), 4 in. (102 mm) and 6 in. (152 mm) high and 6.0 in. (152 mm) wide.

SCOOP/BUCKET FLIGHT CROSS SECTIONAL AREA FOR VERTICAL INCLINE	
Flight Height	**Area**
3 in. (76 mm) 4 in. (102 mm) 6 in. (152 mm)	4.3 sq. in. (2774 sq. mm) 6.0 sq. in. (3871 sq. mm) 9.5 sq. in. (6129 sq. mm)
Bucket Height	**Area**
2,25 in. (57 mm) 3 in. (76 mm) 4 in. (102 mm) 6 in. (152 mm)	2,3 sq. in. (1484 mm^2) 3,31 sq. in. (2135 mm^2) 4,68 sq. in. (3019 mm^2) 7,45 sq. in. (4806 mm^2)

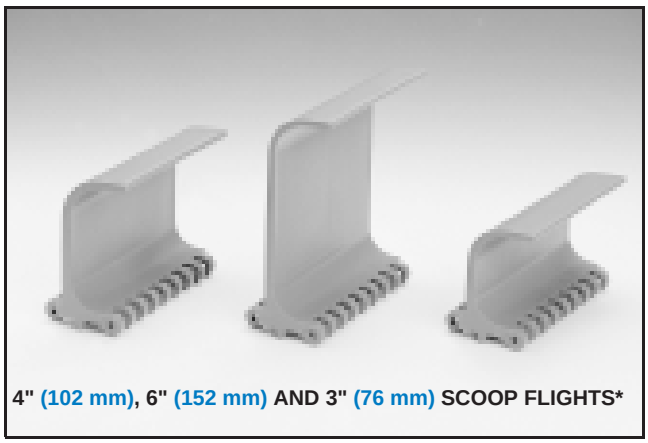
NOTE: Minimum row spacing is 6" (152 mm) for 6" (152 mm) Buckets and 4" (102 mm) for all other sizes.



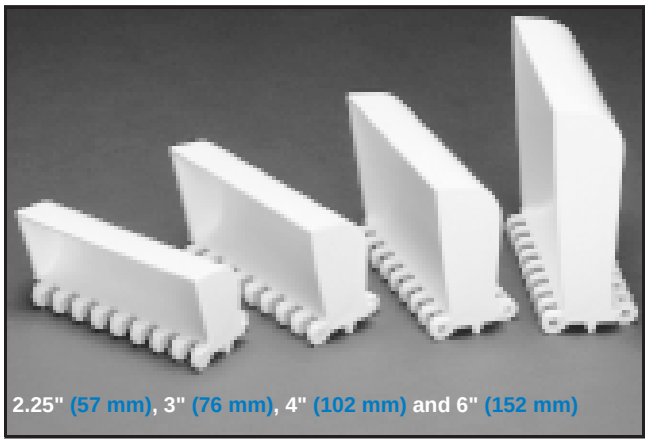
SIDEGUARDS — Sideguards, used to assure product containment, are available in 2 in. (51 mm), 3 in. (76 mm) and 4 in. (102 mm) heights. They are of the standard overlapping design and are an integral part of the belt, fastened by the hinge rods. The minimum indent is 1.3 in. (33 mm). The normal gap between the sideguards and the edge of a flight is 0.3 in. (8 mm). When going around the 6 and 8 tooth sprocket, the sideguards will fan out, opening a gap at the top of the sideguard which may allow small products to fall out. The sideguards stay completely closed when going around the 10, 12 and 16 tooth sprockets.



SERIES 800 FLAT TOP BELT WITH STREAMLINE FLIGHTS AND SIDEGUARDS



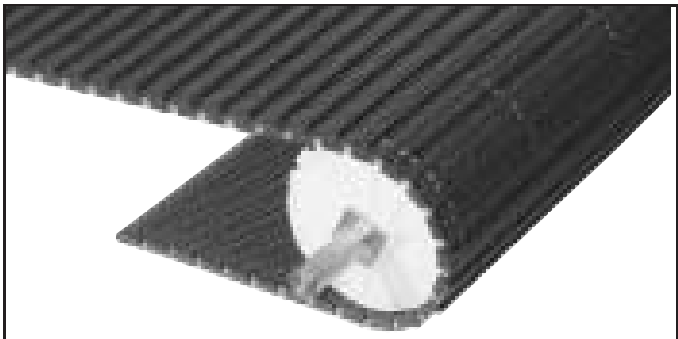
4" (102 mm), 6" (152 mm) AND 3" (76 mm) SCOOP FLIGHTS*

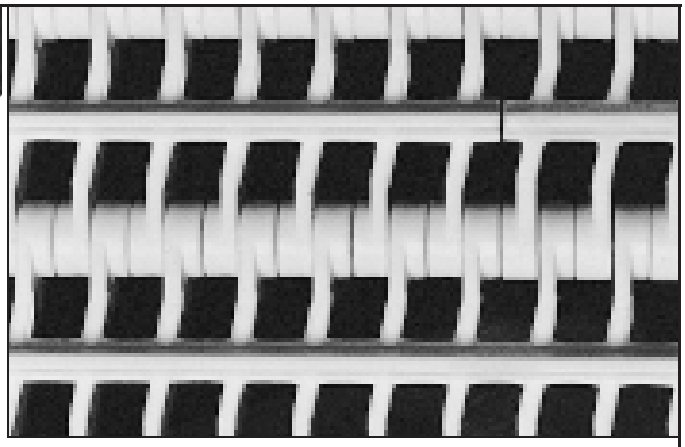


2.25" (57 mm), 3" (76 mm), 4" (102 mm) and 6" (152 mm)

800

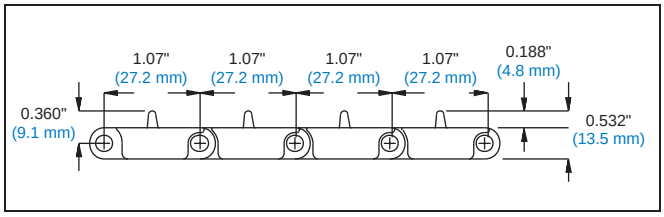
NOTES





OPEN GRID, 38% Open Area
USDA accepted (Meat and Poultry)

- Opening size: (approximate) 0.24 in. (6.1 mm) x 0.28 in. (7.1 mm).
- 1.07 in. (27.2 mm) pitch, centre-driven, open hinge.
- Low-profile transverse ridges 0.188 in. (4.8 mm) high assist in moving product up inclines and down declines.
- Large, open area allows for excellent drainage.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	Agriculture Canada
Polypropylene*	Polypropylene	700 (1040)	34 (1) to 220 (104)	0.81 (3.95)	•	•	•
Polyethylene	Polyethylene	350 (520)	-50 (-46) to 150 (66)	0.84 (4.09)	•	•	•
Acetal	Polypropylene	1480 (2200)	34 (1) to 200 (93)	1.26 (6.14)	•	•	•
Acetal**	Polyethylene	1000 (1490)	-50 (-46) to 70 (21)	1.26 (6.14)	•	•	•

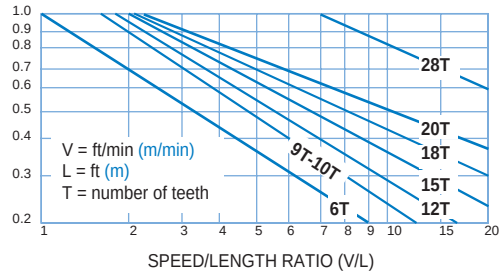
* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	THESE PRODUCTS ARE NOT RECOMMENDED FOR BACK-UP CONDITIONS. IF VALUES ARE REQUIRED, CONTACT INTRALOX SALES ENGINEERING.				
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)					
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)					
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

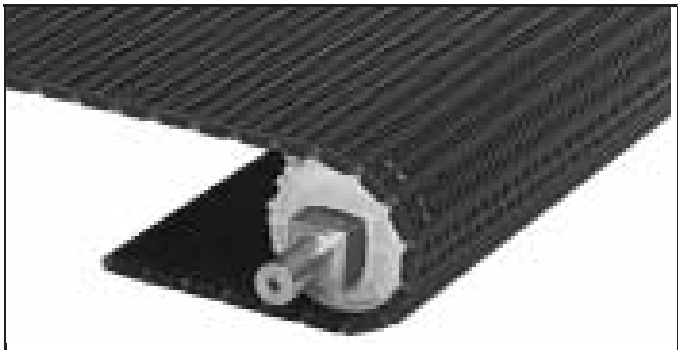
S Strength Factor

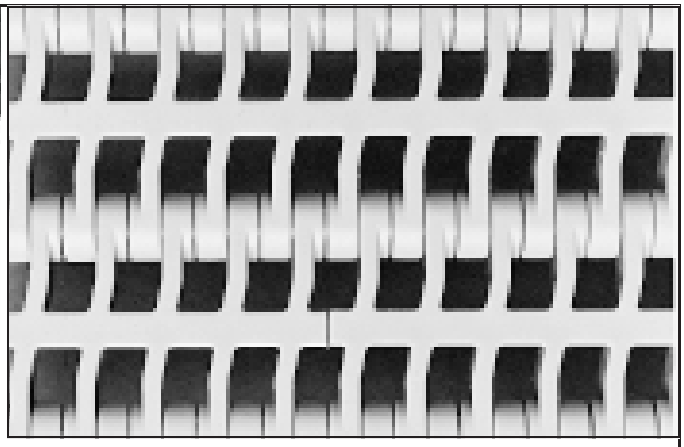


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

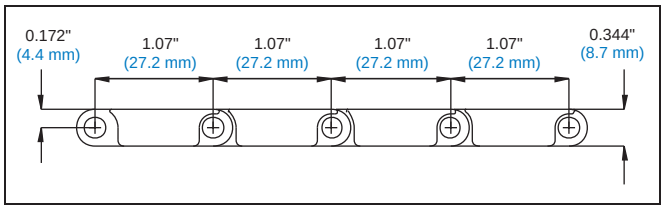
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- The normal indent of the ridge is 0.25 in. (6 mm).





FLUSH GRID, 38% Open Area
USDA accepted (Meat and Poultry)

- Opening size: (approximate) 0.24 in. (6.1 mm) x 0.28 in. (7.1 mm).
- 1.07 in. (27.2 mm) pitch, centre-driven, open hinge.
- Open pattern with smooth upper surface, fully flush edges.
- Offers excellent lateral movement of containers.
- Flight and Sideguards are available.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



900

Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	Agriculture Canada	M*
Polypropylene**	Polypropylene	700 (1040)	34 (1) to 220 (104)	0.76 (3.70)	•	•	•	•
Polyethylene	Polyethylene	350 (520)	-50 (-46) to 150 (66)	0.81 (3.96)	•	•	•	•
Acetal	Polypropylene	1480 (2200)	34 (1) to 200 (93)	1.15 (5.62)	•	•	•	
EC Acetal	Polypropylene	800 (1190)	34 (1) to 200 (93)	1.15 (5.62)				
FR-TPES	Polypropylene	750 (1120)	40 (7) to 180 (82)	1.19 (5.81)				
FDA HR Nylon	FDA Nylon	1200 (1790)	-50 (-46) to 240 (116)	1.10 (5.40)	•			
Non FDA HR Nylon	Non FDA Nylon	1200 (1790)	-50 (-46) to 310(154)	1.10 (5.40)				
Acetal***	Polyethylene	1000 (1490)	-50 (-46) to 70 (21)	1.26 (6.14)	•	•	•	

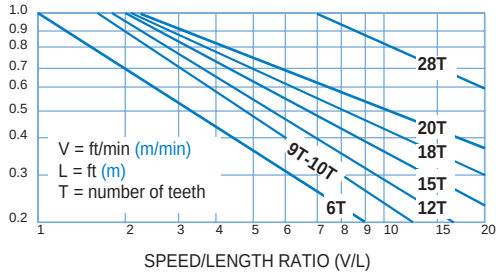
* M - MAF and New Zealand Dairy. MAF acceptance requires the use of Clean-In-Place systems.
** Do not use PP in high impact conditions below 7°C.
*** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors		F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material		UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)		0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)		NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)		0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
EC Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.20)	— (0.28)
FR-TPES (S)		— (0.13)	—	—	—	—	—	—	—	0.23 (0.35)
HR Nylon	(S)	— (0.18)	— (0.13)	— (0.17)	— (0.27)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
72 °F (22 °C)	(A)	— (0.30)	— (0.25)	— (0.26)	— (0.26)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
HR Nylon	(S)	NR	NR	— (0.18)	— (0.27)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)
Max. Temp.	(A)	NR	NR	— (0.32)	— (0.39)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

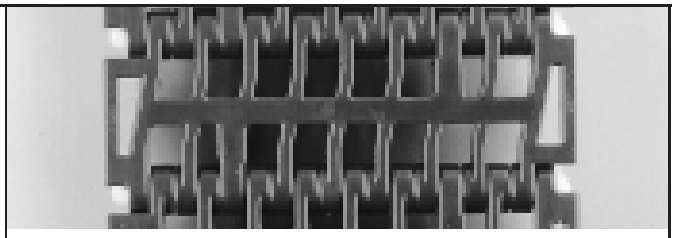


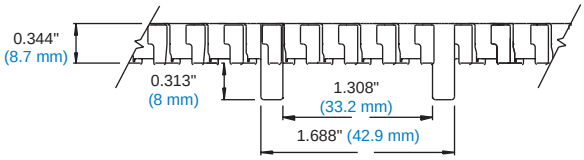
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- HR Nylon is for use in dry, elevated temperature applications.
- FDA HR Nylon can be used in intermittent high temperatures up to 270 °F (132 °C); non FDA HR Nylon can be used in intermittent high temperatures up to 360 °F (182 °C).
- HR Nylon belts use short rodlets to hold the main hinge rod in place. The rodlets are made from the same materials as the main rod.
- HR Nylon can use standard moulded sprockets; stainless steel split sprockets can be used for elevated temperatures.
- Flame Retardant Thermoplastic Polyester (FR-TPES) material is V-0 rated (UL94 @ 1/32").



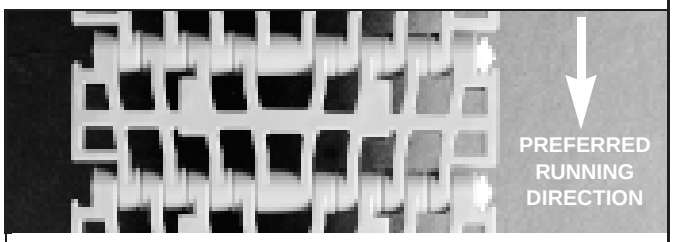


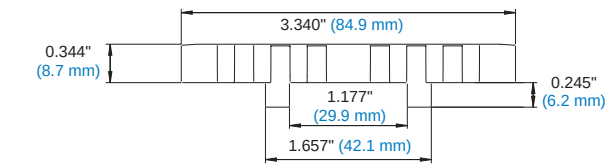
SERIES 900 FLUSH GRID MOULD TO WIDTH, 3.25" (82.5 mm)

MOULD TO WIDTH FLUSH GRID, 38% Open Area

- Opening size: (approximate) 0.24 in. (6.1 mm) x 0.28 in. (7.1 mm).
- 1.07 in. (27.2 mm) pitch, centre-driven, open hinge, with fully flush edges.
- Tracking tabs provide lateral tracking.
- Moulded in widths of 3.25 in. (82.6 mm), 4.5 in. (114.3 mm) and 7.5 in. (190.5 mm). Also available moulded in a dedicated 85 mm width.

(See Important NOTE on page 1-8)





SERIES 900 FLUSH GRID 3.25" (85 mm) MOULD TO WIDTH

Belt Data

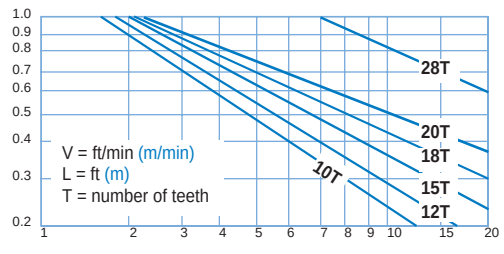
Belt Width in. (mm)	Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)	
3.25 (83)	Polypropylene*	Nylon	130 (59)	34 (1) to 220 (104)	0.31 (0.46)	•	
3.25 (83)	Acetal	Nylon	250 (113)	-50 (-46) to 200 (93)	0.42 (0.62)	•	
4.5 (114)	Polypropylene	Nylon	263 (120)	34 (1) to 220 (104)	0.39 (0.58)	•	
4.5 (114)	Acetal	Nylon	555 (252)	-50 (-46) to 200 (93)	0.54 (0.80)	•	
7.5 (191)	Polypropylene	Nylon	438 (199)	34 (1) to 220 (104)	0.59 (0.88)	•	
7.5 (191)	Acetal	Nylon	800 (363)	-50 (-46) to 200 (93)	0.85 (1.26)	•	
(85)	Acetal	Nylon	275 (125)	-50 (-46) to 200 (93)	0.38 (0.57)	•	

* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

S Strength Factor

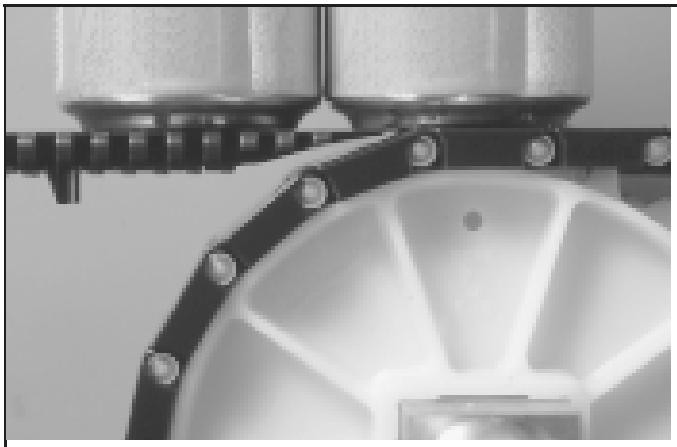


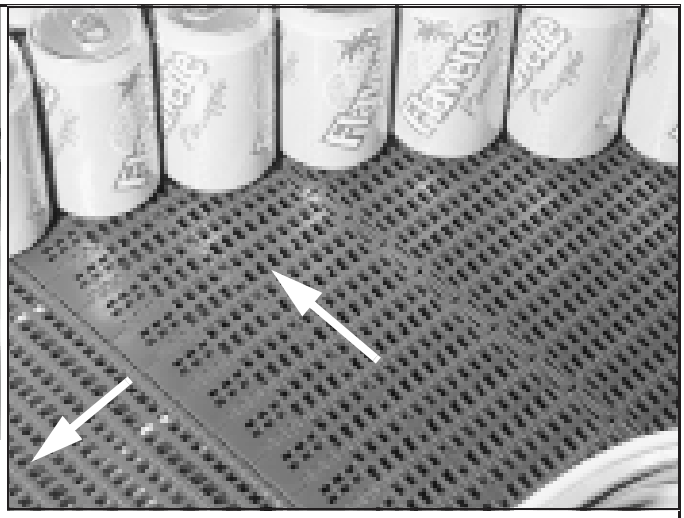
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

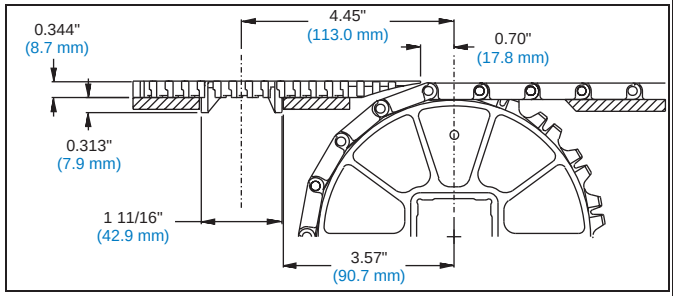
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- **Series 900 Mould To Width** belts are boxed in 10 ft. (3.05 m) increments.
- One sprocket can be placed on the 3.25 in. (82.5 mm) and 85 mm mould to width belt. Up to three sprockets can be placed on the 4.5 in. (114.3 mm) mould to width belt. Up to five sprockets can be placed on the 7.5 in. (190.5 mm) mould to width belt.
- The **Series 900 Mould To Width** belt should not be used with sprockets smaller than a 3.5 in. (89 mm) pitch diameter (10 tooth) sprocket.





ONEPIECE™ LIVE TRANSFER FLUSH GRID, 38% Open Area

- Opening size: (approximate) 0.24 in. (6.1 mm) x 0.28 in. (7.1 mm).
- 1.07 in. (27.2 mm) pitch, centre-driven, open hinge.
- Transfer edge is an integral part of this belt.
- Designed for smooth, self-clearing, right angle transfers onto take-away belts.
- Moulded tracking tabs fit into standard 1-3/4 in. (44.5 mm) wearstrip tracks insuring proper belt alignment.
- Built with nylon rods for superior wear resistance.
- Custom-built in widths from 4 in. (101.6 mm) and up, in approximately 0.33 in. (8.4 mm) increments. Also available in a 4.7 in. (119.4 mm) and 6 in. (152.4 mm) dedicated width chain. ***(See NOTE on page 1-8)***



Belt Data

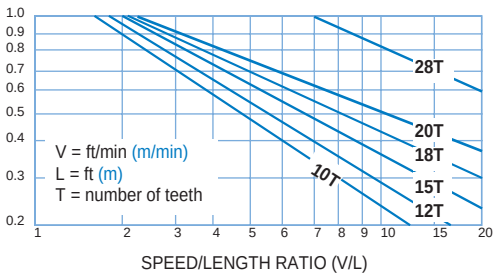
Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Nylon	700 (1040)	34 (1) to 220 (104)	0.93 (4.54)	•		
Acetal	Nylon	1480 (2200)	-50 (-46) to 200 (93)	1.15 (5.62)	•		
FR-TPES	Nylon	1000 (1490)	40 (7) to 180 (82)	1.63 (7.95)			

* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
FR-TPES (S)	— (0.13)	—	—	—	—	— (0.18)	—	—	— (0.30)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

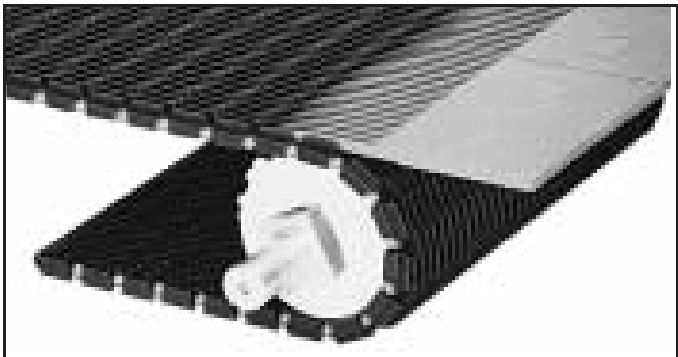
S Strength Factor

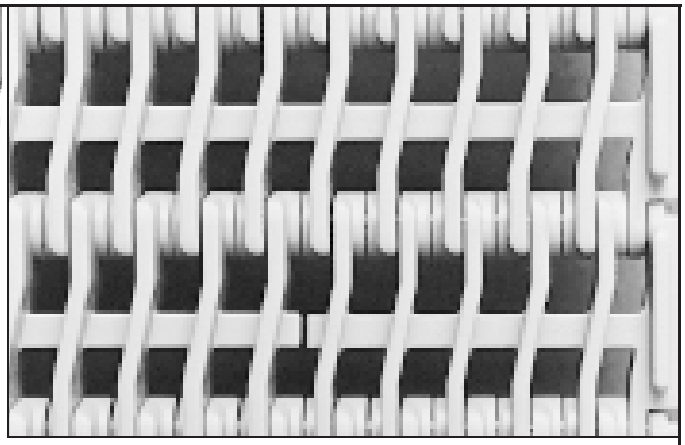


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

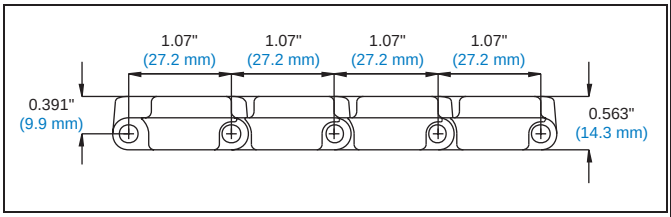
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- Refer to Section 3, page 3-18, 90° CONTAINER TRANSFERS for more information.
- When product is moving from the transfer belt to a takeaway belt, the top of the transfer belt should be 0.06 in. (1.5 mm) above the top of the takeaway belt. When product is moving from the infeed belt onto the transfer edge, the top of the belts should be level.
- You may need to include a fixed frame support member beneath the ONEPIECE™ Live Transfer belt prior to the actual transfer. This will insure that the ONEPIECE™ Live Transfer belt does not snag when it intersects with the takeaway belt. See Figure 3-7, on page 3-7, for an illustration.
- The **Series 900 ONEPIECE™ Live Transfer** belt should not be used with sprockets smaller than a 3.5 in. (89 mm) pitch diameter (10 tooth) sprocket.





RAISED RIB
38% Open Area
35% Product Contact Area
USDA accepted (Meat and Poultry)

- Opening size: (approximate) 0.24 in. (6.1 mm) x 0.28 in. (7.1 mm).
- 1.07 in. (27.2 mm) pitch, centre-driven, open hinge.
- Raised Ribs extend 3/16 in. (4.7 mm) above basic module, with fully flush edges.
- Can be used with Finger Transfer Plates eliminating product tip-page and hang-ups.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



900

Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	Agriculture Canada
Polypropylene*	Polypropylene	700 (1040)	34 (1) to 220 (104)	1.07 (5.21)	•	•	•
Polyethylene	Polyethylene	350 (520)	-50 (-46) to 150 (66)	1.14 (5.57)	•	•	•
Acetal	Polypropylene	1480 (2200)	34 (1) to 200 (93)	1.68 (8.19)	•	•	•
EC Acetal	Polypropylene	800 (1190)	34 (1) to 200 (93)	1.68 (8.19)			
FDA HR Nylon	Nylon	1200 (1790)	-50 (-46) to 240 (116)	1.60 (7.80)	•		
Non FDA HR Nylon	Nylon	1200 (1790)	-50 (-46) to 310 (154)	1.60 (7.80)			
Acetal**	Polyethylene	1000 (1490)	-50 (-46) to 70 (21)	1.68 (8.19)	•	•	•

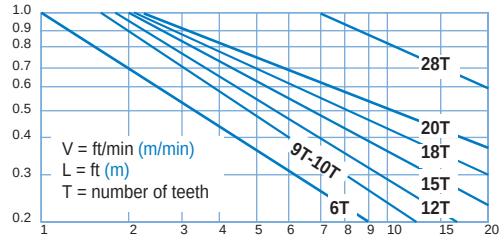
* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors		F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material		UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)		0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)		NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)		0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
EC Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.20)	0.33 (0.27)
HR Nylon	(S)	— (0.18)	— (0.13)	— (0.17)	— (0.27)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
72 °F (22 °C)	(A)	— (0.30)	— (0.25)	— (0.26)	— (0.26)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
HR Nylon	(S)	NR	NR	— (0.18)	— (0.27)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)
Max. Temp.	(A)	NR	NR	— (0.32)	— (0.39)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

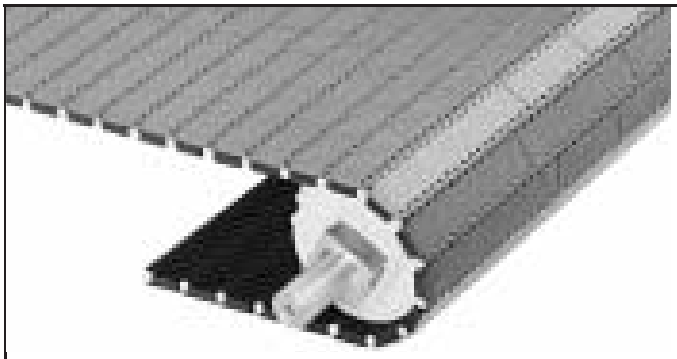
S Strength Factor

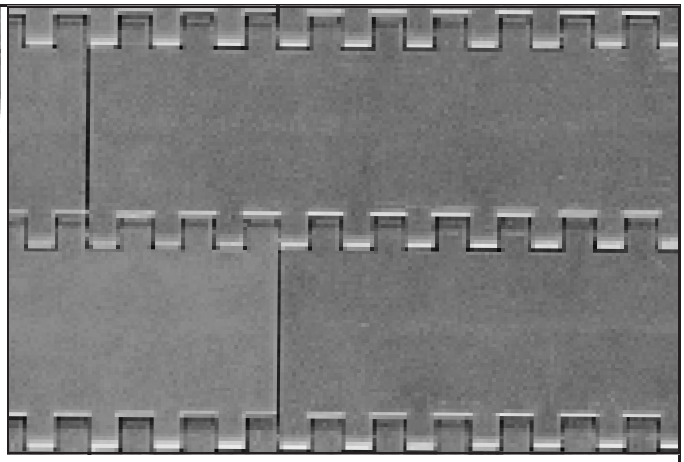


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

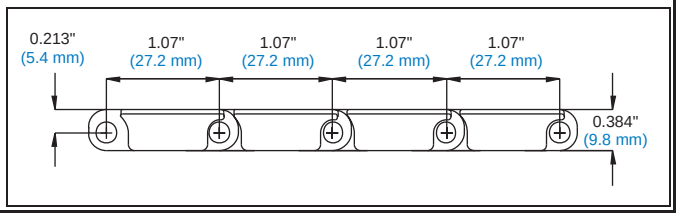
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- HR Nylon is for use in dry, elevated temperature applications.
- FDA HR Nylon can be used in intermittent high temperatures up to 270 °F (132 °C); non FDA HR Nylon can be used in intermittent high temperatures up to 360 °F (182 °C).
- HR Nylon belts use short rodlets to hold the main hinge rod in place. The rodlets are made from the same materials as the main rod.
- HR Nylon can use standard moulded sprockets; stainless steel split sprockets can be used for elevated temperatures.





FLAT TOP, 0% Open Area

- 1.07 in. (27.2 mm) pitch, centre-driven, closed hinge.
- Smooth, closed surface with fully flush edges and recessed rods.
- Ideal for container handling, especially glass.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



900

Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	700 (1040)	34 (1) to 220 (104)	0.96 (4.69)	•		
Polyethylene	Polyethylene	350 (520)	-100 (-46) to 150 (66)	1.01 (4.95)	•		
Acetal	Polypropylene	1480 (2200)	34 (1) to 200 (93)	1.50 (7.30)	•		
EC Acetal	Polypropylene	800 (1190)	34 (1) to 200 (93)	1.50 (7.30)			
FDA HR Nylon	Nylon	1200 (1790)	-50 (-46) to 240 (116)	1.40 (6.80)	•		
Non FDA HR Nylon	Nylon	1200 (1790)	-50 (-46) to 310 (154)	1.40 (6.80)			
Acetal**	Polyethylene	1000 (1490)	-50 (-46) to 70 (21)	1.50 (7.30)	•		

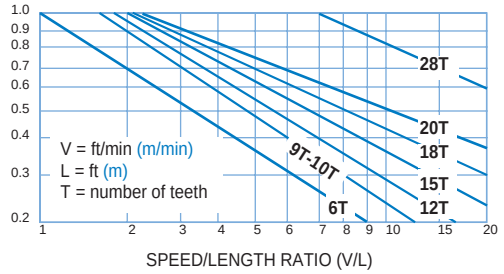
* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors		F_w Friction between wearstrip and belt — Wearstrip material				F_p Friction between product and belt — Product material (used in backup conditions)				
Belt Material		UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)		0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)		NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)		0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
EC Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.20)	0.33 (0.27)
HR Nylon	(S)	— (0.18)	— (0.13)	— (0.17)	— (0.27)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
72 °F (22 °C)	(A)	— (0.30)	— (0.25)	— (0.26)	— (0.26)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
HR Nylon	(S)	NR	NR	— (0.18)	— (0.27)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)
Max. Temp.	(A)	NR	NR	— (0.32)	— (0.39)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

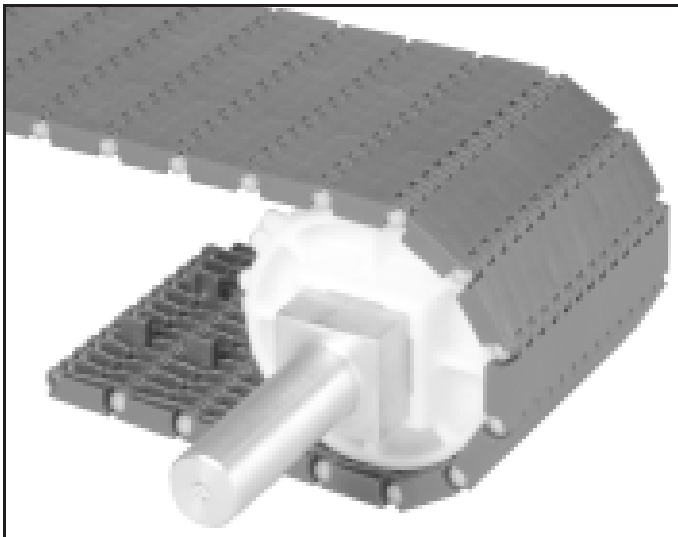


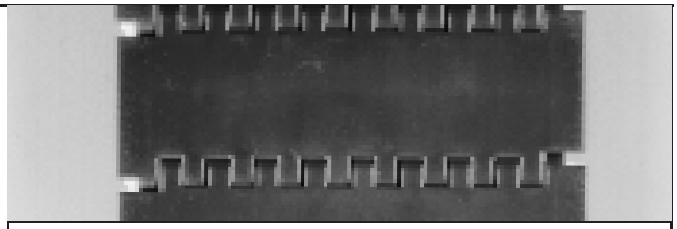
SPEED/LENGTH RATIO (V/L)

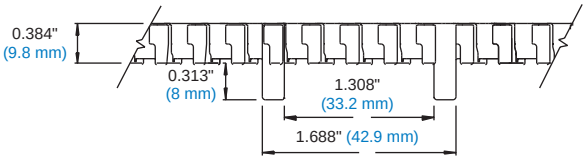
Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- HR Nylon is for use in dry, elevated temperature applications.
- FDA HR Nylon can be used in intermittent high temperatures up to 270 °F (132 °C); non FDA HR Nylon can be used in intermittent high temperatures up to 360 °F (182 °C).
- HR Nylon belts use short rodlets to hold the main hinge rod in place. The rodlets are made from the same materials as the main rod.
- HR Nylon can use standard moulded sprockets; stainless steel split sprockets can be used for elevated temperatures.





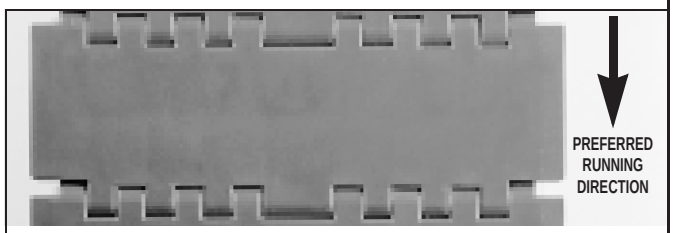


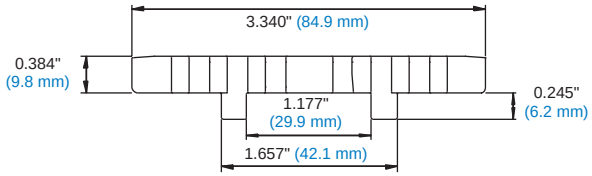
SERIES 900 FLAT TOP MOULD TO WIDTH

MOULD TO WIDTH FLAT TOP, 0% Open Area

- 1.07 in. (27.2 mm) pitch, centre-driven, open hinge, with fully flush edges.
- Tracking tabs provide lateral tracking.
- Moulded in widths of 3.25 in. (82.6 mm), 4.5 in. (114.3 mm) and 7.5 in. (190.5 mm). Also available moulded in a dedicated 85 mm width.

(See Important NOTE on page 1-8)





SERIES 900 FLAT TOP 85 mm MOULD TO WIDTH

Belt Data

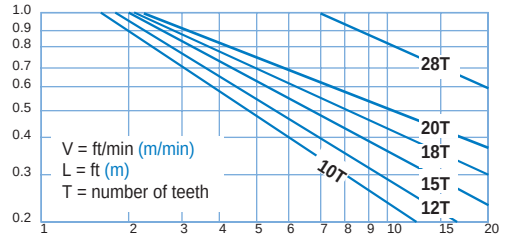
Belt Width in. (mm)	Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)	
3.25 (82.6)	Polypropylene*	Nylon	130 (59)	34 (1) to 220 (104)	0.37 (0.55)	•	
3.25 (82.6)	Acetal	Nylon	250 (113)	-50 (-46) to 200 (93)	0.52 (0.77)	•	
4.5 (114.3)	Polypropylene	Nylon	263 (120)	34 (1) to 220 (104)	0.52 (0.77)	•	
4.5 (114.3)	Acetal	Nylon	555 (252)	-50 (-46) to 200 (93)	0.74 (1.10)	•	
7.5 (190.5)	Polypropylene	Nylon	438 (199)	34 (1) to 220 (104)	0.83 (1.24)	•	
7.5 (190.5)	Acetal	Nylon	800 (363)	-50 (-46) to 200 (93)	1.18 (1.76)	•	
(85)	Acetal	Nylon	500 (227)	-50 (-46) to 200 (93)	0.50 (0.74)	•	

* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

S Strength Factor

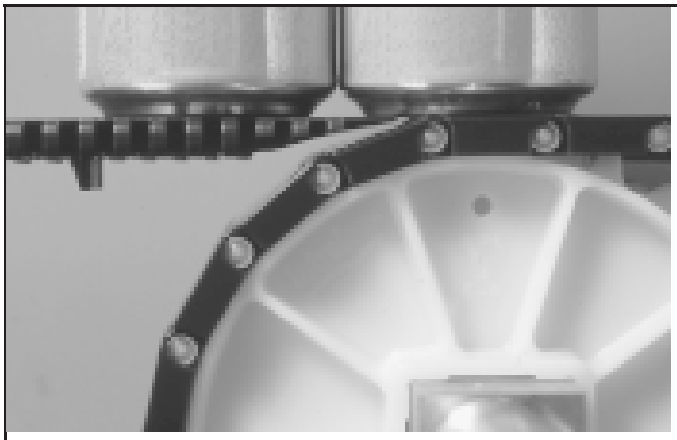


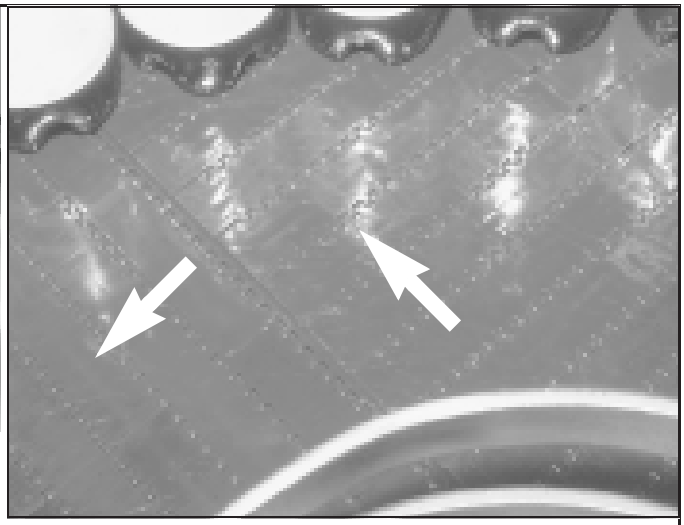
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- **Series 900 Mould To Width** belts are boxed in 10 ft. (3.05 m) increments.
- One sprocket van be placed on the 3.25 in. (82.5 mm) and 85 mm mould to width belt. Up to three sprockets can be placed on the 4.5 in. (114.3 mm) mould to width belt. Up to five sprockets can be placed on the 7.5 in. (190.5 mm) mould to width belt.
- The **Series 900 Mould To Width** belt should not be used with sprockets smaller than a 3.5 in. (89 mm) pitch diameter (10 tooth) sprocket.

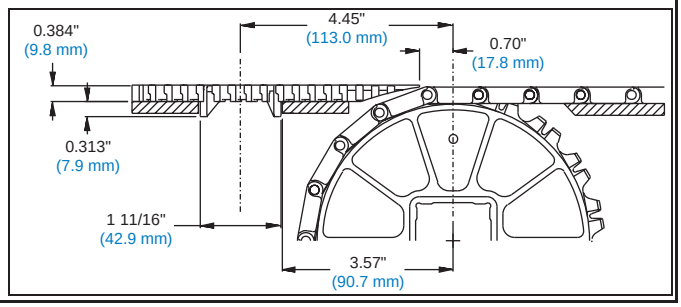




ONEPIECE™ LIVE TRANSFER FLAT TOP, 0% Open Area

- 1.07 in. (27.2 mm) pitch, centre-driven, closed hinge.
- Transfer edge is an integral part of this belt.
- Designed for smooth, self-clearing, right angle transfers onto takeaway belts.
- Moulded tracking tabs fit into standard 1-3/4 in. (44.5 mm) wearstrip tracks insuring proper belt alignment.
- Built with nylon rods for superior wear resistance.
- Custom-built in widths from 4 in. (102 mm) and up, in approximately 0.33 in. (8.4 mm) increments. Also available in a 4.7 in. (119 mm) and 6 in. (152 mm) dedicated width chain.

(See Important NOTE on page 1-8)



Belt Data

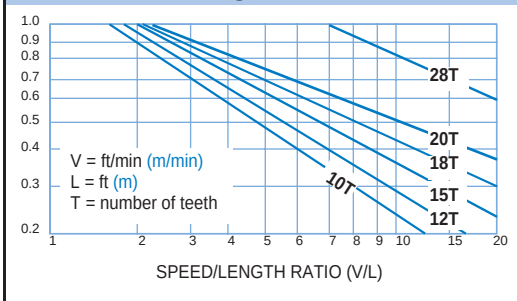
Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Nylon	700 (1040)	34 (1) to 220 (104)	0.93 (4.54)	•		
Acetal	Nylon	1480 (2200)	-50 (-46) to 200 (93)	1.50 (7.30)	•		

* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

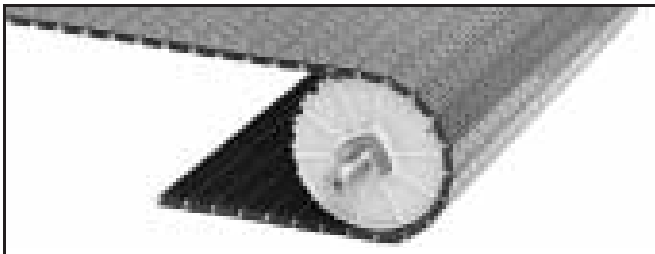
S Strength Factor

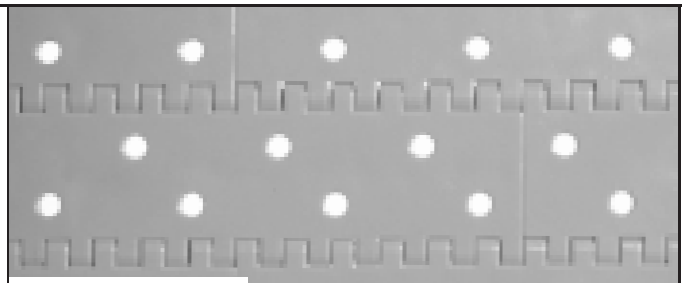


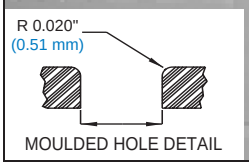
Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

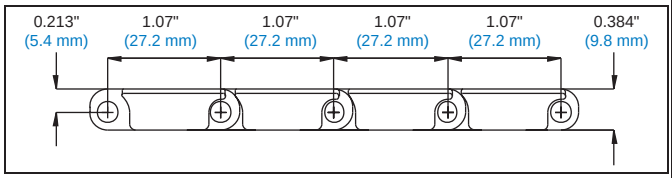
Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- Refer to 90° CONTAINER TRANSFERS, in Section 3, page 3-18, for more information.
- When product is moving from the transfer belt to a takeaway belt, the top of the transfer belt should be 0.06 in. (1.5 mm) above the top of the takeaway belt. When product is moving from the infeed belt onto the transfer edge, the top of the belts should be level.
- You may need to include a fixed frame support member beneath the ONEPIECE™ Live Transfer belt prior to the actual transfer. This will insure that the ONEPIECE™ Live Transfer belt does not snag when it intersects with the takeaway belt. See Figure 3-28, on page 3-19, for an illustration.
- The **Series 900 ONEPIECE™ Live Transfer** belt should not be used with sprockets smaller than a 3.5 in. (89 mm) pitch diameter (10 tooth) sprocket.









PERFORATED FLAT TOP

- Available hole sizes:
  - ∅ 1/8 in. (3.2 mm) - 5.1% Open Area
  - ∅ 5/32 in. (4.0 mm) - 6.4% Open Area
  - ∅ 3/16 in. (4.8 mm) - 7.9% Open Area
- All hole sizes include 2.8% open area at the hinge.
- 1.07 in. (27.2 mm) pitch, centre-driven, closed hinge.
- Designed for vacuum transfer applications, with a scalloped underside to reduce carryway blockage.
- All holes have a radiused top edge allowing quiet operation and good vacuum performance.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***

Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight - 1/8" lb/sq ft (kg/sq m)	W Belt Weight - 5/32" lb/sq ft (kg/sq m)	W Belt Weight - 3/16" lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)
Polypropylene*	Polypropylene	700 (1040)	34 (1) to 220 (104)	—	0.93 (4.54)	—	•
Polyethylene	Polyethylene	350 (520)	-100 (-73) to 150 (66)	—	0.98 (4.79)	—	•
Acetal	Polypropylene	1480 (2200)	34 (1) to 200 (93)	1.48 (7.23)	1.46 (7.11)	1.43 (6.98)	•
EC Acetal	Polypropylene	800 (1190)	34 (1) to 200 (93)	1.48 (7.23)	1.46 (7.11)	1.43 (6.98)	
FR-TPES	Polypropylene	1000 (1490)	40 (7) to 180 (82)	—	1.59 (7.76)	1.56 (7.61)	
FDA HR Nylon	Nylon	1200 (1790)	-50 (-46) to 240 (116)	—	1.40 (6.80)	—	•
Non FDA HR Nylon	Nylon	1200 (1790)	-50 (-46) to 310(154)	—	1.40 (6.80)	—	
Acetal**	Polyethylene	1000 (1490)	-50 (-46) to 70 (21)	1.48 (7.23)	1.46 (7.11)	1.43 (6.98)	•

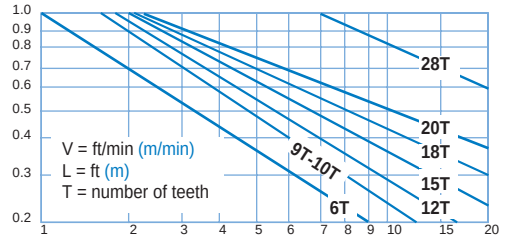
* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.
1/8 in. (3.2 mm) hole size is available in Acetal only. 3/16 in. (4.8 mm) hole size is available in Acetal and FR-TPES only.

Friction Factors		F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material		UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)		0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)		NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)		0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
EC Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.20)	0.33 (0.27)
FR_TPES (S)		— (0.13)	—	—	—	—	—	—	—	—
HR Nylon	(S)	— (0.18)	— (0.13)	— (0.17)	— (0.27)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
72 °F (22 °C)	(A)	— (0.30)	— (0.25)	— (0.26)	— (0.26)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
HR Nylon	(S)	NR	NR	— (0.18)	— (0.27)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)
Max. Temp.	(A)	NR	NR	— (0.32)	— (0.39)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

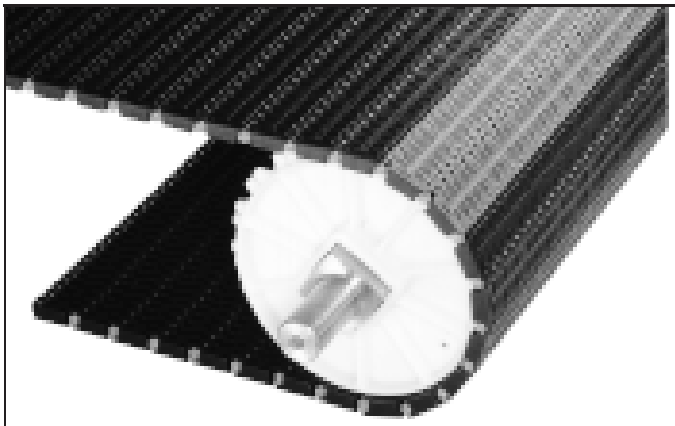
S Strength Factor

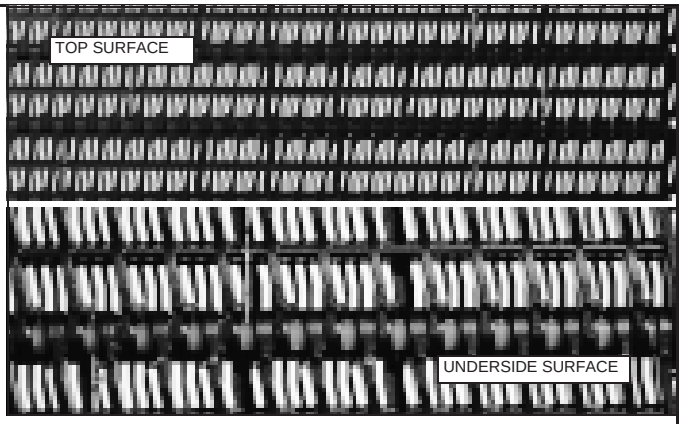


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

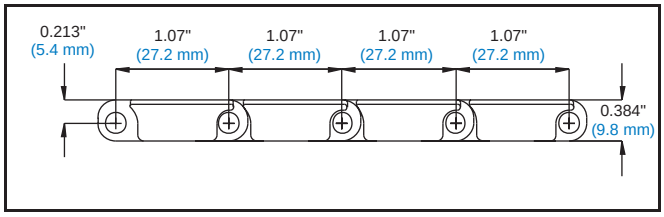
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- Other hole dimensions and patterns can be created by drilling **Series 900 Flat Top**.
- HR Nylon is for use in dry, elevated temperature applications.
- FDA HR Nylon can be used in intermittent high temperatures up to 270 °F (132 °C); non FDA HR Nylon can be used in intermittent high temperatures up to 360 °F (182 °C).
- HR Nylon belts use short rodlets to hold the main hinge rod in place. The rodlets are made from the same materials as the main rod.
- HR Nylon can use standard moulded sprockets; stainless steel split sprockets can be used for elevated temperatures.
- Flame Retardant Thermoplastic Polyester (FR-TPES) material is V-0 rated (UL94 @ 1/32").





MESH TOP, 24% Open Area

- 1.07 in. (27.2 mm) nominal pitch, centre-driven, open hinge.
- Fully flush edges and recessed rods.
- Ideal for fruit and vegetable processing, especially for stemmed products and dewatering applications.
- Custom-built in widths from 2 in. (50.8 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

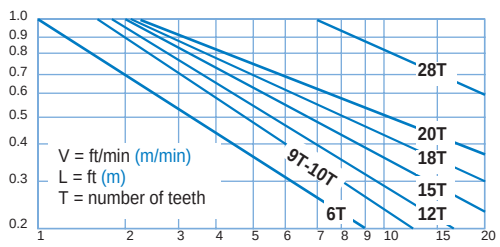
Belt Material	Standard Rod Material ∅ 0.24 in (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene*	Polypropylene	700 (1040)	34 (1) to 220 (104)	0.93 (4.55)	•		
Polyethylene**	Polyethylene	350 (520)	-100 (-73) to 150 (66)	0.99 (4.84)	•		

* Do not use PP in high impact conditions below 7°C.
** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINU WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended.

S Strength Factor

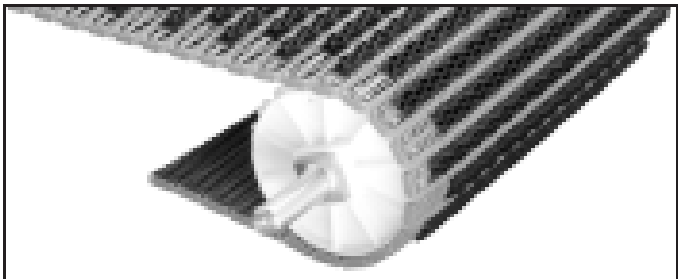


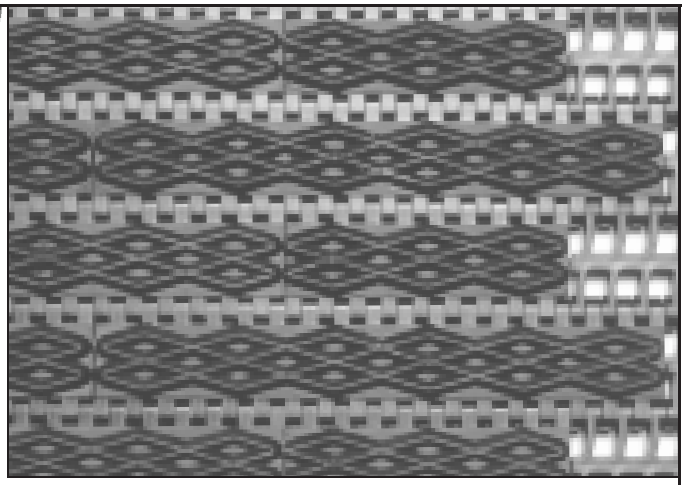
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

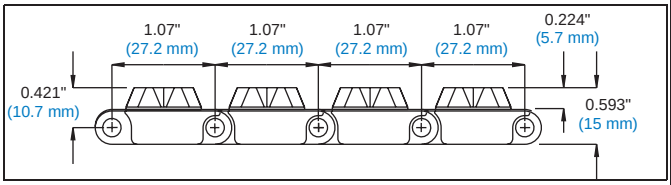
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.





INTRALOX® DIAMOND FRICTION TOP

- Available in **Diamond Friction Top** and **Diamond Friction Top Ultra** (higher rubber concentration).
- White Friction Top materials comply with FDA regulations for use in food processing and packaging applications.
- 1.07 in. (27.2 mm) pitch, centre-driven with fully flush edges.
- Two material rubber modules provide a high friction surface without interfering with carryways and sprockets.
- **Diamond Friction Top** (DFT) is available in widths from 2.3 in. (58.4 mm) and up, and **Diamond Friction Top Ultra** (DFT ULTRA) is available in widths from 3.0 in. (76.2 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***
- Available in black rubber on grey polypropylene, white rubber on white polypropylene and white rubber on natural polyethylene.



Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene* (DFT)	Polypropylene	1000 (1490)	34 (1) to 150 (66)	1.10 (5.40)	White		
Polypropylene (DFT Ultra)	Polypropylene	1000 (1490)	34 (1) to 150 (66)	1.40 (6.80)	White		
Polyethylene (DFT)	Polyethylene	350 (520)	-50 (-46) to 120 (49)	1.20 (5.90)	Natural		
Polyethylene (DFT Ultra)	Polyethylene	350 (520)	-50 (-46) to 120 (49)	1.50 (7.30)	Natural		

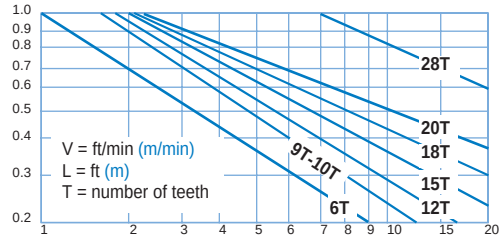
* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	THESE PRODUCTS ARE NOT RECOMMENDED FOR BACK-UP CONDITIONS. IF VALUES ARE REQUIRED, CONTACT INTRALOX SALES ENGINEERING.				
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)					
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

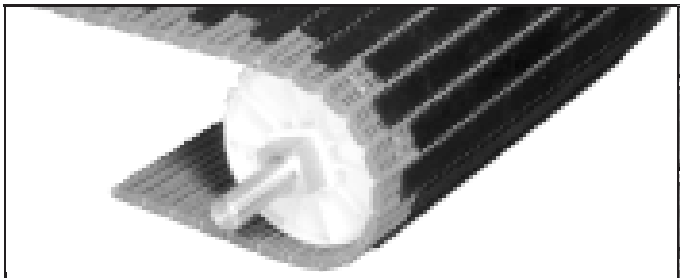
S Strength Factor

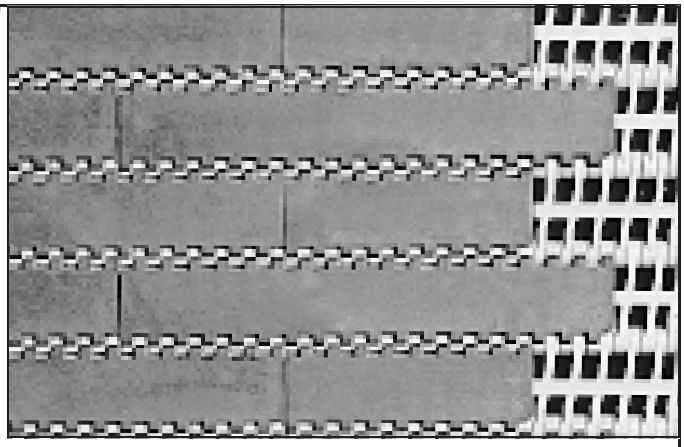


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

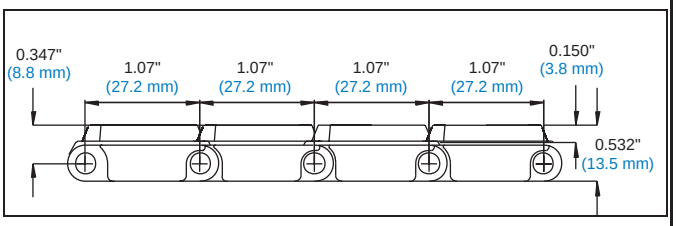
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- **Intralox Diamond Friction Top** has approximately 17% to 45% rubber, depending upon width. **Intralox Diamond Friction Top Ultra** has 52% to 100% rubber.
- White materials are FDA compliant.
- Black rubber top modules have a hardness of 45 Shore A. White rubber top modules have a hardness of 56 Shore A.
- If a centre-drive setup is used, it may be necessary to place collars to laterally retain the belt at the backbend roller before the drive. Abrasion Resistant rods are required.
- Temperature, environmental conditions and product characteristics affect the effective maximum degree of incline. Take these items into consideration when designing conveyor systems utilizing these belts.





INTRALOX® FLAT FRICTION TOP

- Available in **Flat Friction Top** and **Flat Friction Top Ultra** (higher rubber concentration).
- White Friction Top materials comply with FDA regulations for use in food processing and packaging applications.
- 1.07 in. (27.2 mm) pitch, centre-driven with fully flush edges.
- Two material rubber modules provide a high friction surface without interfering with carryways and sprockets.
- **Flat Friction Top** (FFT) is available in widths from 2.3 in. (58.4 mm) and up, and **Flat Friction Top Ultra** (FFT ULTRA) is available in widths from 3.0 in. (76.2 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***
- Available in black rubber on grey polypropylene, white rubber on white polypropylene.



Belt Data

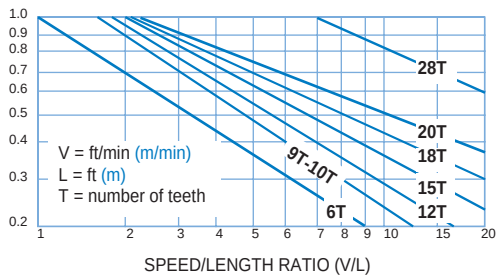
Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)		
Polypropylene* (FFT)	Polypropylene	1000 (1490)	34 (1) to 150 (66)	1.10 (5.40)	White		
Polypropylene (FFT Ultra)	Polypropylene	1000 (1490)	34 (1) to 150 (66)	1.40 (6.80)	White		

* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	THESE PRODUCTS ARE NOT RECOMMENDED FOR BACK-UP CONDITIONS. IF VALUES ARE REQUIRED, CONTACT INTRALOX SALES ENGINEERING.				
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

S Strength Factor



Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 900** is on pages 2-57 to 2-59.
- **Flat Friction Top** has approximately 17% to 45% rubber, depending upon width. **Flat Friction Top Ultra** has 52% to 100% rubber.
- Black rubber has a hardness of 45 Shore A. White rubber has a hardness of 56 Shore A.
- If a centre-drive setup is used, it may be necessary to place collars to laterally retain the belt at the backbend roller before the drive. Abrasion Resistant rods are required.
- Temperature, environmental conditions and product characteristics affect the effective maximum degree of incline. Take these items into consideration when designing conveyor systems utilizing these belts.

Intralox has moulded sprockets for **Series 900** with 6, 9, 10, 12, 18 and 20 teeth. Split sprockets are available for the 12, 15, 17, 18, 20 and 28 tooth sizes. Intralox can machine sprockets (both plastic and split) with different numbers of teeth if the application cannot use the standard sizes. The standard sprocket dimensions are listed in Table A. Shaft information is listed in Table B.

The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

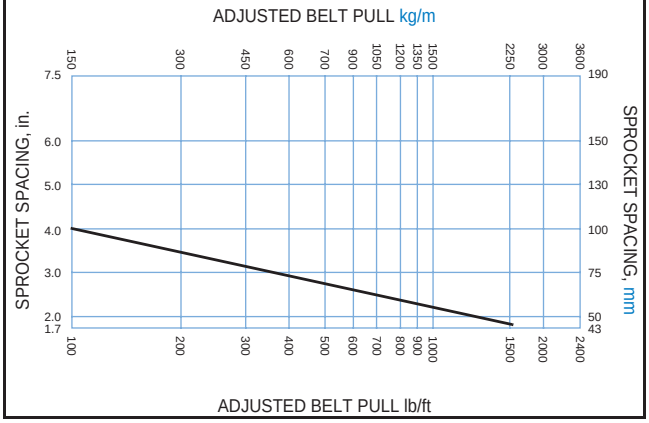
SPROCKET AND SUPPORT QUANTITY REFERENCE

Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
2 (51)	1	2	2
4 (102)	1	2	2
6 (152)	2	2	2
7 (178)	2	3	2
8 (203)	2	3	2
10 (254)	3	3	2
12 (305)	3	3	2
14 (356)	5	4	3
15 (381)	5	4	3
16 (406)	5	4	3
18 (457)	5	4	3
20 (508)	5	5	3
24 (610)	7	5	3
30 (762)	9	6	4
32 (813)	9	7	4
36 (914)	9	7	4
42 (1067)	11	8	5
48 (1219)	13	9	5
54 (1372)	15	10	6
60 (1524)	15	11	6
72 (1829)	19	13	7
84 (2134)	21	15	8
96 (2438)	25	17	9
120 (3048)	31	21	11
144 (3658)	37	25	13
For Other Widths, Use Odd Number of Sprockets** at Maximum 4 in. (102 mm) ℄ Spacing		Maximum 6 in. (152 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

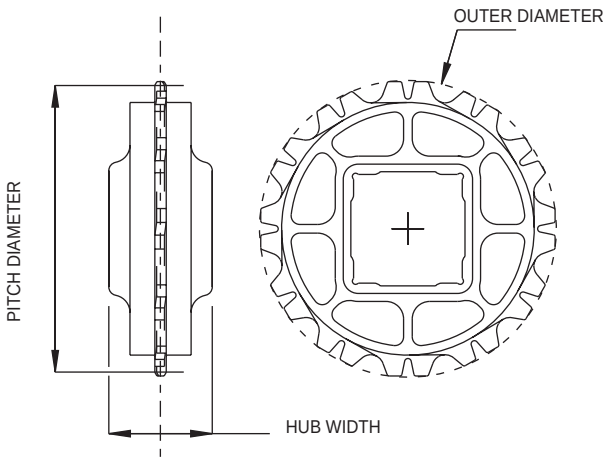
* NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications

** The centre sprocket should be locked down. With only two sprockets, fix the sprocket on the drive journal side only.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



SERIES 900 MOULDED 12 TOOTH SPROCKET



A — SPROCKET DATA

No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.*	Square in.	Round (mm)*	Square (mm)
MOULDED SPROCKETS							
6 (13.40%)	2.1** (53)	2.2 (56)	0.75 (19)		1.0		(25)
9 (6.03%)	3.1 (79)	3.2 (81)	1.0 (25)		1.0		(40)
					1.5		
10 (4.89%)	3.5 (89)	3.6 (91)	0.75 (19)		1.0		(40)
					1.5		
12 (3.41%)	4.1 (104)	4.3 (109)	1.5 (38)	1 to 1-1/2	1.5	(25 to 40)	(40)
				1-15/16 to 2-3/16		(50 to 55)	
17 (1.70%)	5.8 (147)	6.1 (155)	1.5 (38)	1 3/16 to 1-1/2		(30 to 40)	
18 (1.52%)	6.1 (155)	6.3 (160)	1.5 (38)	1 to 1-1/2	1.5	(25 to 35)	(40)
				1-15/16 to 2-3/16	2.5	(50 to 55)	(60)
20 (1.23%)	6.8 (173)	7.0 (178)	1.5 (38)	1 to 1-1/2	1.5	(25 to 40)	(40)
				1-15/16 to 2-3/16	2.5	(50 to 55)	(60)
SPLIT SPROCKETS See next page for complete Table of Availability							
Contact Customer Service for lead-times.							

* Round bore moulded and split sprockets are frequently furnished with two keyways. Use of two keys is NOT REQUIRED or recommended. Round bore sprockets do not have set screws for locking the sprockets in place. As with square bore sprockets, only the centre-most sprocket needs to be locked down. Key sizes on round bore sprockets conform to ANSI standard B17.I-1967, R1989 and DIN6885.

** See the Retaining Rings section on page 2-76 for information on retaining the 2.1 in. (53 mm) pitch diameter sprocket.

900

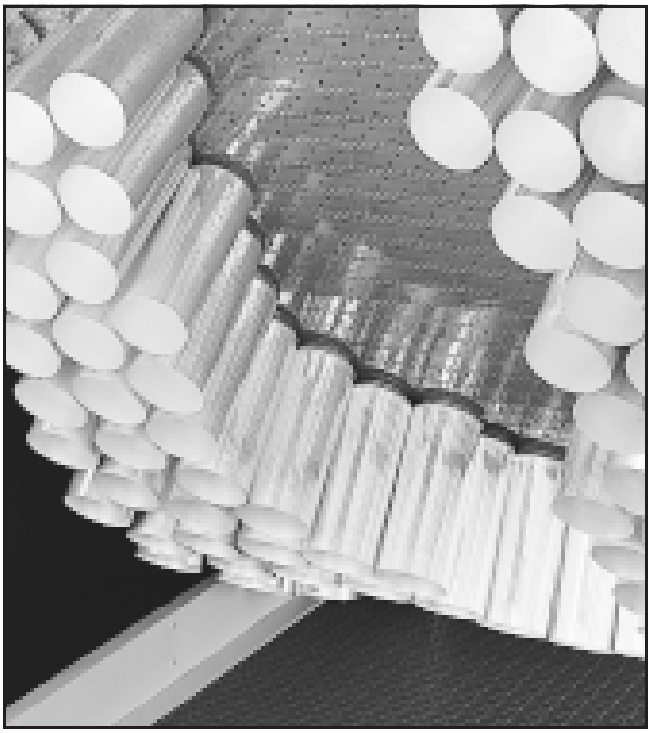
A — SPROCKET DATA (Cont'd.)							
No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.*	Square in.	Round (mm)*	Square (mm)
SPLIT SPROCKETS							
10 (4.89%)	3.5 (89)	3.6 (91)	.75 (19)		1.5		(40)
12 (3.41%)	4.1 (104)	4.3 (109)	1.5 (38)		1.5		(40)
15 (2.19%)	5.1 (130)	5.3 (135)	1.5 (38)	1-3/16 1-1/4	1.5		
17 (1.70%)	5.8 (147)	6.1 (155)	1.5 (38)			(40)	(40)
18 (1.52%)	6.1 (155)	6.3 (160)	1.5 (38)	1-1/4	1.5 2.5		(40) (60)
20 (1.23%)	6.8 (173)	7.0 (178)	1.5 (38)	1-1/4	1.5 2.5		(40) (60)
28 (0.63%)	9.8 (249)	9.8 (249)	1.5 (38)		1.5 2.5		(40) (60)

Contact Customer Service for lead-times.

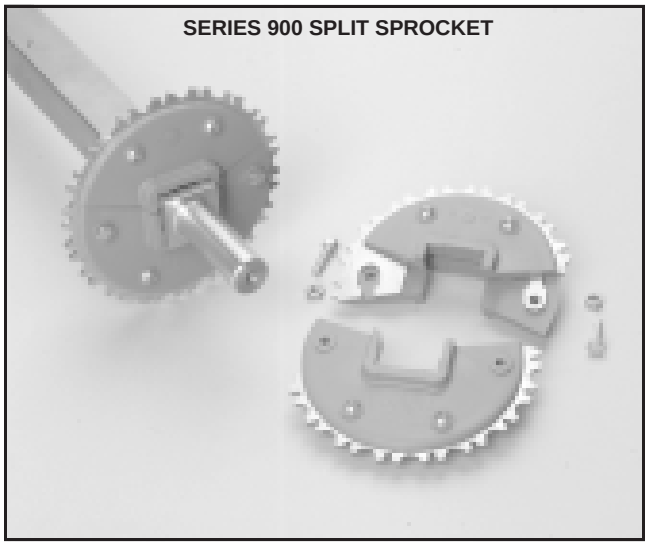
* Round bore moulded and split sprockets are frequently furnished with two keyways. Use of two keys is NOT REQUIRED or recommended. Round bore sprockets do not have set screws for locking the sprockets in place. As with square bore sprockets, only the centre-most sprocket needs to be locked down. Key sizes on round bore sprockets conform to ANSI standard B17.I-1967, R1989 and DIN6885.

Split sprockets are constructed of a 304 stainless steel tooth bearing plate sandwiched between bore specific, polypropylene hubs. For acid applications, the plate maybe made of 316 stainless steel. Stainless steel teeth are generally more abrasion resistant than plastic teeth, thus increasing normal sprocket life. Split sprockets are constructed of FDA compliant materials, but are not USDA accepted for food contact applications.

Installing or removing split sprockets (sub-assembled by Intralox) is accomplished using only two bolts. On new equipment, shafts can be mounted and plumbed before sprocket installation. On existing equipment, sprockets may be replaced without removing the shafts. Split sprockets and moulded sprockets can be used together on the same shaft.



SERIES 900 SPLIT SPROCKET



B — SHAFT DATA				
SIZE	Q SHAFT WEIGHT, lb/ft (kg/m)			I MOMENT OF INERTIA in.^{4} (mm^4)
	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	
1.0 IN. SQUARE	1.17* (1.74)	3.40* (5.06)	3.40* (5.06)	0.083 (34,600)
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (11.38)	0.42 (175,600)
2.5 IN. SQUARE	7.34 (10.92)	21.25* (31.62)	21.25* (31.62)	3.25 (1,355,000)
25 mm SQUARE	(1.70) 1.14	(4.92)** 3.31	(4.92)** 3.31	(32,550) 0.078
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
60 mm SQUARE	(10.05) 6.75	(29.11)** 19.56	(29.11)** 19.56	(1,080,000) 2.78
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

* Intralox USA offers square shafting in these materials and sizes.
** Intralox Europe offers square shafting in these materials and sizes.

BELT ACCESSORIES

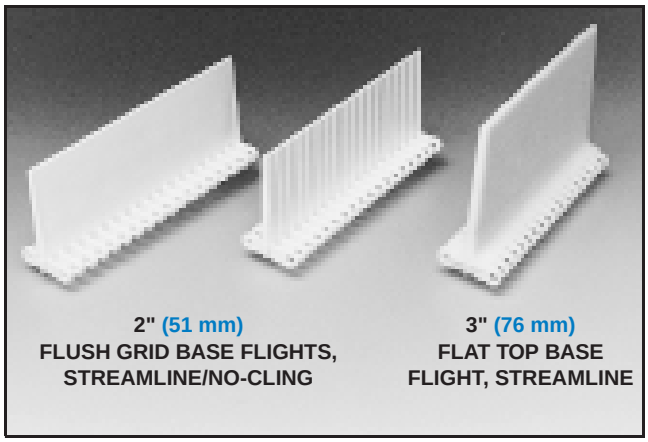
FLIGHTS — Series 900 Flush Grid base flights are available in 1 in. (25 mm) and 2 in. (51 mm) heights. Flat Top base flights are available in 1 in. (25 mm), 2 in. (51 mm) and 3 in. (76 mm) heights. These flights can be cut down to any height to meet customer requirements. Each flight rises out of the centre of its supporting module, moulded as an integral part. No fasteners are required. One side of the Flush Grid flight is smooth (Streamline) while the other is ribbed vertically (No-Cling). The Flat Top flight is smooth (Streamline) on both sides. The minimum indent (without sideguards) is 0.7 in. (18 mm).

SIDEGUARDS — Sideguards are used to assure product containment and are available 2 in. (51 mm) high. They are of the standard overlapping design and are an integral part of the belt, with no fasteners required. The minimum indent is 1 in. (25 mm). The standard gap between the sideguards and the edge of a flight is 0.2 in. (5 mm). When going around the 6, 9, and 10 tooth sprockets, the sideguards will fan out, opening a gap at the top of the sideguard which might allow small products to fall out. The sideguards stay completely closed when wrapping around the 12 tooth and larger sprockets.

FINGER TRANSFER PLATES — These comb-like plates are designed to be used with **Series 900 Raised Rib** belts to eliminate product transfer and tipping problems. The 18 fingers extend between the belt's ribs allowing a smooth continuation of the product flow as the belt engages its sprockets. Finger Transfer Plates are installed easily on the conveyor frame with the shoulder bolts supplied. Caps snap easily into place over the bolts, keeping foreign materials out of the slots.

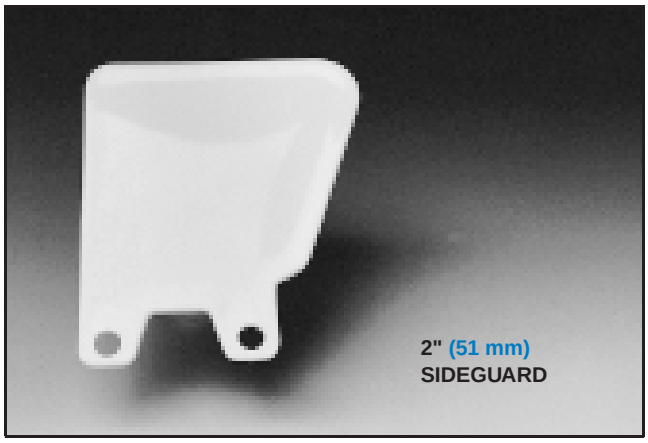
Intralox also offers a 4 in. (102 mm) (12 finger) Finger Transfer Plate for use **only** when retrofitting from **Series 100 Raised Rib** to **Series 900 Raised Rib**. These finger plates are designed to fit the mounting hole spacing for **Series 100** finger plates. The fingers of the 4 in. (102 mm) finger plate are sized for the ribs of the **Series 900 Raised Rib** belt, but the back edge of the plate tapers down to match the thickness of the **Series 100** Finger Transfer Plates for smooth transfer to existing equipment. The 4 in. (102 mm) wide **cannot** be mixed with the 6 in. (152 mm) wide finger plates. The 4 in. (102 mm) finger plates use the standard shoulder bolts and the **Series 900** snap cap bolt covers. See page 3-16 for dimensional information.

SERIES 900 ACCESSORIES (Nominal Dimensions)			
Flat Top Base Flights	**Flush Grid Base Flights**	**Sideguards**	**Finger Transfer Plates**
1 in. (25 mm) 2 in. (51 mm) 3 in. (76 mm)	1 in. (25 mm) 2 in. (51 mm)	2 in. (51 mm)	6 in. (152 mm) 18 Fingers 4 in. (102 mm) 12 Fingers
AVAILABLE MATERIALS			
Acetal Polypropylene Polyethylene	Acetal Polypropylene Polyethylene HR Nylon (FDA) HR Nylon (Non-FDA)	Acetal Polypropylene Polyethylene HR Nylon (FDA) HR Nylon (Non-FDA)	Acetal

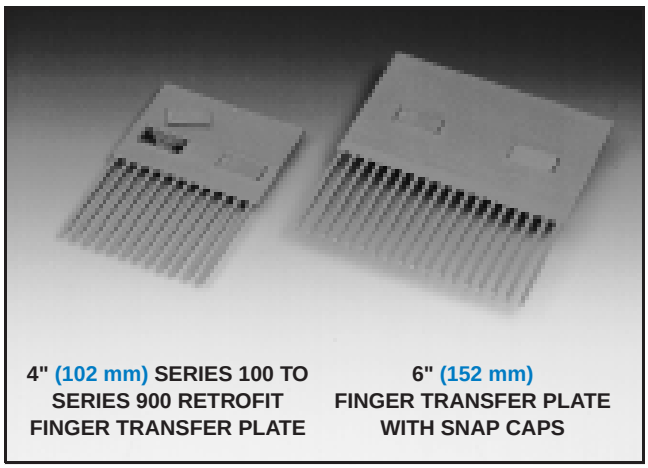


2" (51 mm) FLUSH GRID BASE FLIGHTS, STREAMLINE/NO-CLING

3" (76 mm) FLAT TOP BASE FLIGHT, STREAMLINE

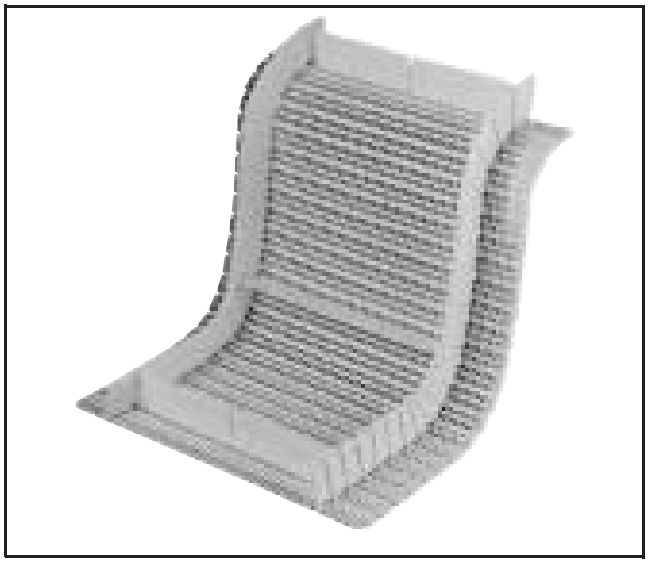


2" (51 mm) SIDEGUARD



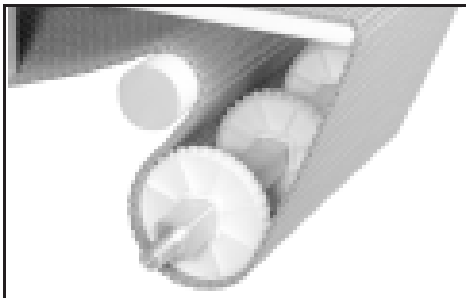
4" (102 mm) SERIES 100 TO SERIES 900 RETROFIT FINGER TRANSFER PLATE

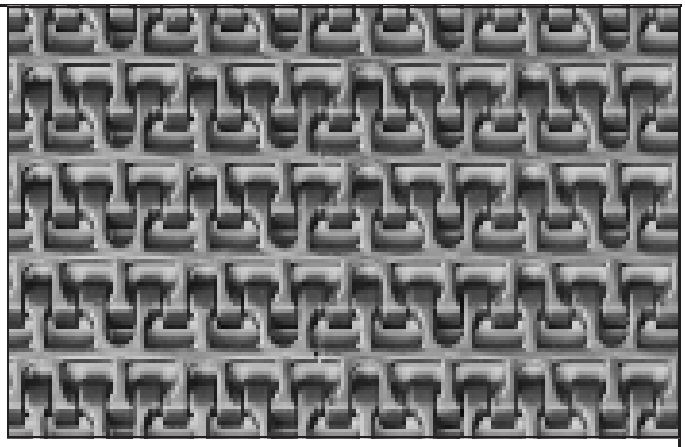
6" (152 mm) FINGER TRANSFER PLATE WITH SNAP CAPS



SERIES 900 FLUSH GRID BELT WITH FLIGHTS AND SIDEGUARDS

NOTES

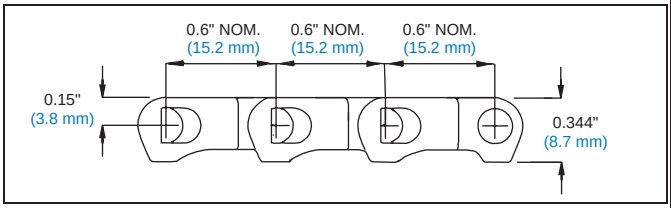




FLUSH GRID, 28% Open Area
USDA accepted (Meat and Poultry, and Dairy)

- Minimum opening size (approx.): 0.17 in. (4.3 mm) x 0.10 in. (2.5 mm).
- Maximum opening size (approx.): 0.31 in. (7.9 mm) x 0.10 in. (2.5 mm).
- Hinge-driven, nominal 0.6 in. (15.2 mm) pitch belt with fully flush edges.
- Lightweight with smooth surface grid.
- Mini-pitch reduces chordal action and transfer dead plate gap.
- Custom-built in widths from 3 in. (76.2 mm) and up, in 1 in. (25.4 mm) increments. FR-TPES and EC Acetal are built in widths from 5 in. (127 mm) and up, in approximately 1 in. (25.4 mm) increments.

(See page 1-8)



Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability					
					FDA (USA)	USDA-Meat and Poultry	USDA Diary **	Agriculture Canada	M ****	A*****
Polypropylene*	Polypropylene	700 (1040)	34 (1) to 220 (104)	0.81 (3.95)	•	•	White	•	•	•
Polyethylene	Polyethylene	450 (670)	-50 (-46) to 150 (66)	0.87 (4.25)	•	•	Natural	•	•	•
Acetal	Polypropylene	1300 (1940)	34 (1) to 200 (93)	1.19 (5.80)	•	•		•		
EC Acetal	Polypropylene	800 (1190)	34 (1) to 200 (93)	1.19 (5.80)						
FR-TPES	Polypropylene	750 (1120)	40 (7) to 180 (82)	1.30 (6.34)						
Non FDA HR Nylon	Non FDA HR Nylon	1100 (1640)	-50 (-46) to 310 (154)	1.20 (5.80)						
UV Resistant PP	UV Resistant PP	700 (1040)	34 (1) to 220 (104)	0.81 (3.95)						
Acetal***	Polyethylene	1200 (1790)	-50 (-46) to 70 (21)	1.19 (5.80)	•	•				•

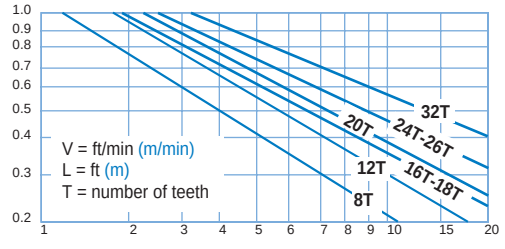
* Do not use PP in high impact conditions below 7°C.
** USDA Dairy and MAF acceptance require the use of an clean-in-place system.
*** Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.
****M - MAF - New Zealand Dairy. *****AQIS - Australian Quarantine and Inspection Service

Friction Factors		F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material		UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)		0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)		NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)		0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
EC Acetal (S)		0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.19 (0.20)	0.13 (0.16)	— (0.18)	0.33 (0.27)
FR-TPES (S)		— (0.13)	—	—	—	—	— (0.18)	—	—	— (0.30)
HR Nylon	(S)	— (0.18)	— (0.13)	— (0.17)	— (0.27)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
72 °F (22 °C)	(A)	— (0.30)	— (0.25)	— (0.26)	— (0.26)	— (0.16)	— (0.27)	— (0.16)	— (0.19)	— (0.28)
HR Nylon	(S)	NR	NR	— (0.18)	— (0.27)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)
Max. Temp.	(A)	NR	NR	— (0.32)	— (0.39)	— (0.19)	— (0.27)	— (0.47)	— (0.23)	— (0.25)
UV Resistant PP		0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

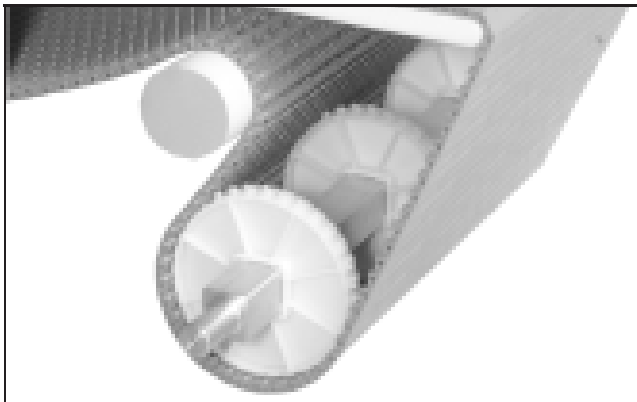
S Strength Factor

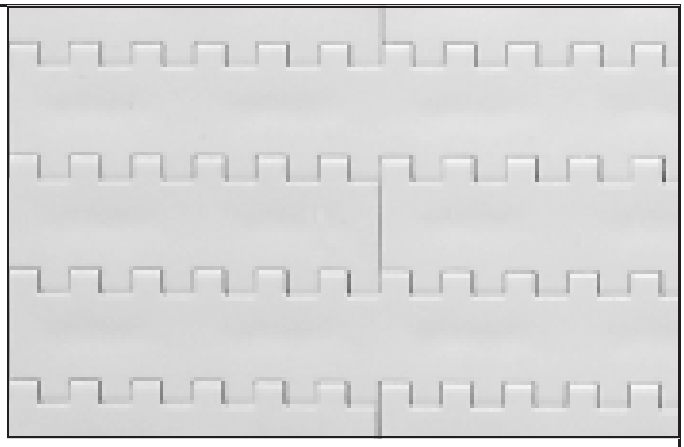


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

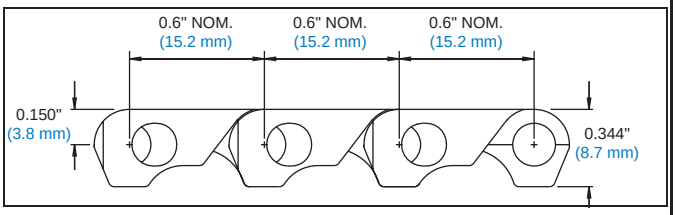
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 1100** is on pages 2-65 to 2-67.
- Can be used over 0.75 in. (19 mm) diameter nosebar for tight transfers.
- On belts that are an odd number of inches wide (e.g., 7 in., 13 in., or an odd multiple of 25.4 mm) the centre sprocket will be 0.5 in. (13 mm) off belt centre, except for 8 and 12 tooth sprockets which can be placed on belt centerline.
- Non FDA HR Nylon can be used in intermittent high temperatures up to 360 °F (182 °C).
- Flame Retardant Thermoplastic Polyester (FR-TPES) material is V-0 rated (UL94 @ 1/32").





FLAT TOP, 0% Open Area
USDA accepted (Meat and Poultry)

- Hinge-driven, nominal 0.6 in. (15.2 mm) pitch belt with fully flush edges.
- Lightweight with smooth, closed surface grid.
- Mini-pitch reduces chordal action and transfer dead plate gap.
- Custom-built in widths from 3 in. (76.2 mm) and up, in approximately 1 in. (25.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	USDA Dairy*	M **	A***
Polypropylene***	Polypropylene	500 (750)****	34 (1) to 220 (104)	0.90 (4.40)	•	•	white	•	•
Polyethylene	Polyethylene	300 (450)	-50 (-46) to 150 (66)	0.96 (4.69)	•	•	natural	•	•
Acetal	Polypropylene	1000 (1490)	34 (1) to 200 (93)	1.30 (6.35)	•	•	white		
Acetal*****	Polyethylene	900 (1340)	-50 (-46) to 70 (21)	1.30 (6.35)	•	•	white		

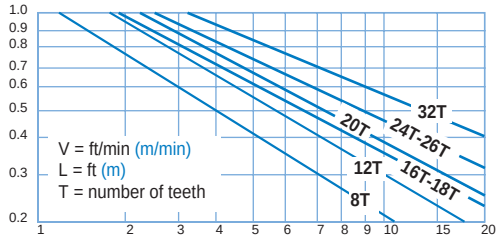
* USDA Dairy and MAF acceptance require the use of an clean-in-place system.
** M - MAF - New Zealand Dairy. ***AQIS - Australian Quarantine and Inspection Service
*** Do not use PP in high impact conditions below 7°C.
**** When using steel split sprockets, the belt strength for polypropylene is 400 lb/ft (595 kg/m); polyethylene is 240 lb/ft (360 kg/m).
*****Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor

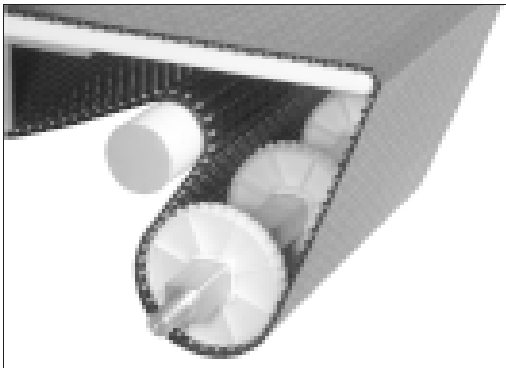


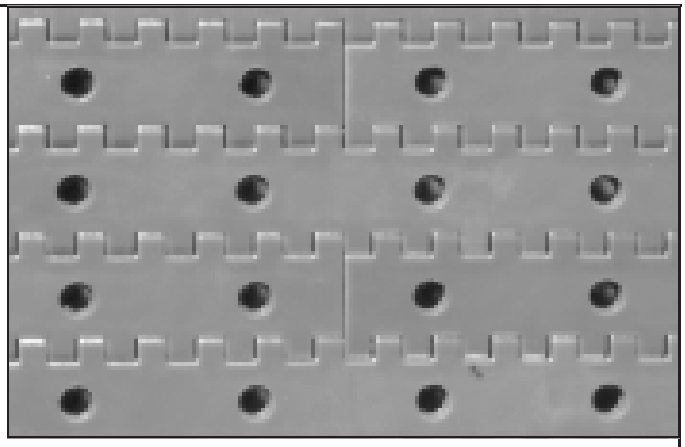
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

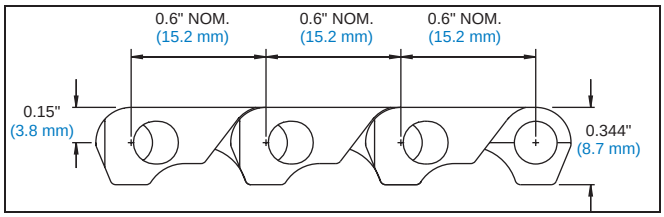
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 1100** is on pages 2-65 to 2-67.
- Can be used over 0.75 in. (19 mm) diameter nosebar for tight transfers.
- On belts that are an odd number of inches wide (e.g., 7 in., 13 in., or an odd multiple of 25.4 mm) the centre sprocket will be 0.5 in. (13 mm) off belt centre, except for 8 and 12 tooth sprockets which can be placed on belt centerline.





PERFORATED FLAT TOP, 3.2% Open Area
USDA accepted (Meat and Poultry)

- Available with 5/32 in. (4 mm) round perforations on a nominal 1 in. (25.4 mm) x 0.6 in. (15.2 mm) perforation pattern.
- Hinge-driven, nominal 0.6 in. (15.2 mm) pitch belt with fully flush edges.
- For use on vacuum applications requiring tight, end-to-end transfers.
- Underside design and small pitch allows the belt to run smoothly around nosebars.
- Custom-built in widths from 3 in. (76.2 mm) and up, in approximately 1 in. (25.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

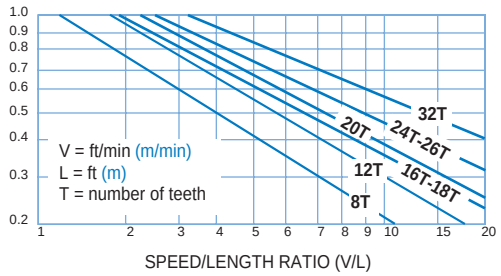
Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry		
Acetal	Polypropylene	1000 (1490)	34 (1) to 200 (93)	1.30 (6.35)	•	•		
Acetal*	Polyethylene	900 (1340)	-50 (-46) to 70 (21)	1.30 (6.35)	•	•		

* Polyethylene rods can be used in cold applications when impacts or sudden starts/stops occur. Please note lower rating.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

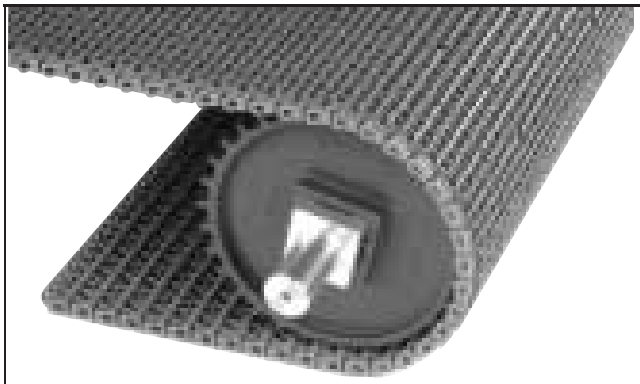
S Strength Factor

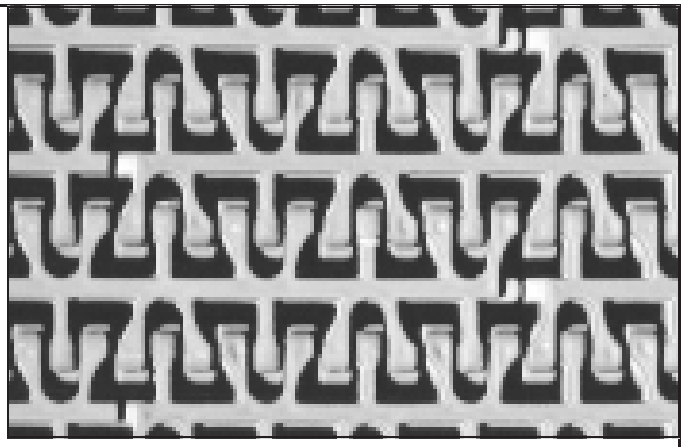


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

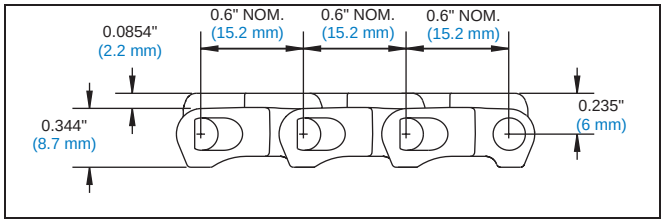
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 1100** is on pages 2-65 to 2-67.
- Can be used over 0.75 in. (19 mm) diameter nosebar for tight transfers.
- On belts that are an odd number of inches wide (e.g., 7 in., 13 in., or an odd multiple of 25.4 mm) the centre sprocket will be 0.5 in. (13 mm) off belt centre, except for 8 and 12 tooth sprockets which can be placed on belt centerline.





FLUSH GRID FRICTION TOP, 28% Open Area

- Minimum opening size (approximate): 0.17 in. (4.3 mm) x 0.10 in. (2.5 mm).
- White Friction Top materials comply with FDA regulations for use in food processing and packaging applications.
- Hinge-driven, nominal 0.6 in. (15.2 mm) pitch belt with fully flush edges.
- Mini-pitch reduces chordal action and transfer dead plate gap.
- Custom-built in widths from 3 in. (76.2 mm) and up, in approximately 1 in. (25.4 mm) increments.
- Available with grey rubber on a grey polypropylene belt and white rubber on a white polypropylene belt. ***(See Important NOTE on page 1-8)***



1100

Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry		
Polypropylene*	Polypropylene	700 (1040)	34 (1) to 150 (66)	0.18 (3.98)	White			

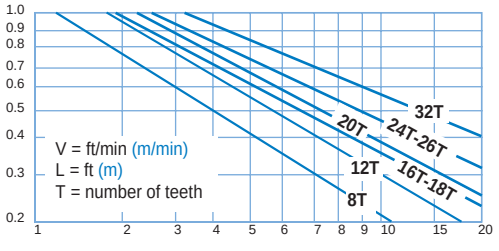
* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	NR* (0.13)	NR* (0.11)	NR* (0.25)	NR* (0.26)	THESE PRODUCTS ARE NOT RECOMMENDED FOR BACK-UP CONDITIONS. IF VALUES ARE REQUIRED, CONTACT INTRALOX SALES ENGINEERING.				
Polypropylene (A)	NR	NR	NR* (0.30)	NR* (0.31)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended.

* If values are required, please contact Intralox Sales Engineering

S Strength Factor



SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Can be used over 0.75 in. (19 mm) diameter nosebar for tight transfers.
- On belts that are an odd number of inches wide (e.g., 7 in., 13 in., or an odd multiple of 25.4 mm) the centre sprocket will be 0.5 in. (13 mm) off belt centre, except for 8 and 12 tooth sprockets, which can be placed on belt centerline.
- Grey rubber has a hardness of 64 Shore A. White rubber has a hardness of 55 Shore A.
- If a centre-drive set up is used, it may be necessary to place collars to laterally retain the belt at the backbend roller before the drive. Abrasion Resistant rods are required.
- Temperature, environmental conditions and product characteristics affect the effective maximum degree of incline. Take these items into consideration when designing conveyor systems utilising these belts.

Intralox has moulded sprockets for **Series 1100** with 16, 18, 20, 24, 26 and 32 teeth, and single plate Stainless Steel sprockets with 8 and 12 teeth. Intralox can machine sprockets with different numbers of teeth if the application cannot use standard sizes. The standard sprocket dimensions are listed in Table A. Shaft information is listed in Table B.

The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

SPROCKET AND SUPPORT QUANTITY REFERENCE

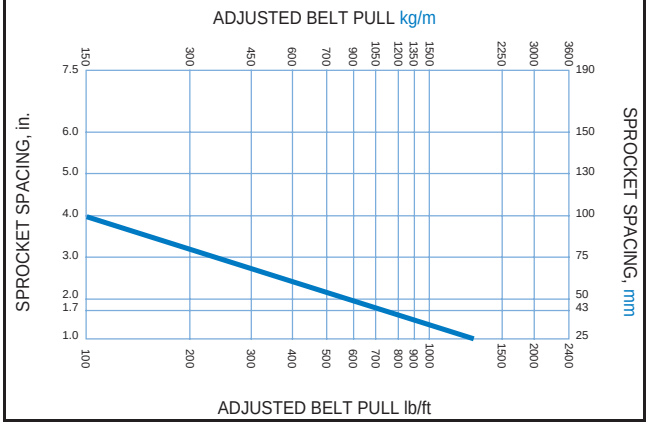
Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
3 (76.2)	1	2	2
4 (102)	1	2	2
6 (152)	2	2	2
7 (178)	2	3	2
8 (203)	2	3	2
10 (254)	3	3	2
12 (305)	3	3	2
14 (356)	5	4	3
15 (381)	5	4	3
16 (406)	5	4	3
18 (457)	5	4	3
20 (508)	5	5	3
24 (610)	7	5	3
30 (762)	9	6	4
32 (813)	9	7	4
36 (914)	9	7	4
42 (1067)	11	8	5
48 (1219)	13	9	5
54 (1372)	15	10	6
60 (1524)	15	11	6
72 (1829)	19	13	7
84 (2134)	21	15	8
96 (2438)	25	17	9
120 (3048)	31	21	11
144 (3658)	37	25	13
For Other Widths, Use Odd Number of Sprockets** at Maximum 4 in. (102 mm) ℄ Spacing		Maximum 6 in. (152 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

* NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications

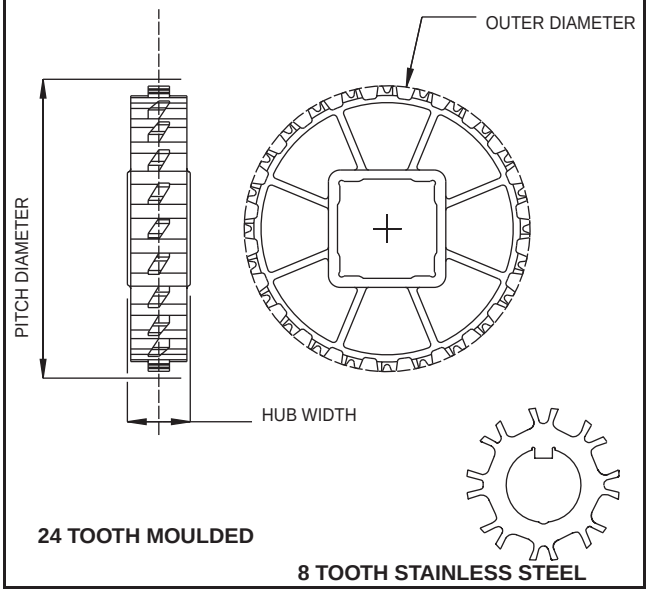
** The centre sprocket should be locked down. With only two sprockets, fix the sprocket on the drive journal side only.

Because of the single plate steel design, Intralox recommends using twice as many 8 and 12 tooth sprockets as indicated above.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



SERIES 1100 24 TOOTH SPROCKETS



A — SPROCKET DATA

No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.*	Square in.	Round (mm)*	Square (mm)
MOULDED SPROCKETS							
16 (1.92%)	3.1 (79)	3.1 (79)	1.0 (25)	1 to 1-1/4	1.5	(25 to 30)	(40)
18 (1.52%)	3.5 (89)	3.5 (89)	0.75 (19)		1.0		(25)
					1.5		(40)
20 (1.23%)	3.8*** (97)	3.8 (97)	1.0 (25)		1.5		
24 (0.86%)	4.6 (117)	4.7 (119)	1.0 (25)	1 to 1-1/4	1.5	(25 to 30)	(40)
					2.5		(60)
26 (0.73%)	5.1 (130)	5.1 (130)	1.0 (25)	1 to 1-1/4	1.5	(25 to 30)	(40)
32 (0.48%)	6.1 (155)	6.2 (157)	1.0 (25)	1 to 1-1/4	1.5	(25 to 30)	(40)
					2.5		(60)

Call Customer Service for lead-times.

* Round bore moulded and split sprockets are frequently furnished with two keyways. Use of two keys is NOT REQUIRED nor recommended. Round bore sprockets do not have set screws for locking the sprockets in place. As with square bore sprockets, only the centre-most sprocket needs to be locked down. Key sizes on round bore sprockets conform to ANSI standard B17.I-1967, R1989 and DIN6885.

** The stainless steel sprockets have a male key in the round bore sizes (see the drawing of the 8 tooth sprocket at the top of this page). Since the key is part of the sprocket, only the centre sprockets should be locked down to track the belt. The male key requires that the shaft keyway run the entire length of the shaft.

*** The 3.8 in. (97 mm) sprocket is machined, not moulded.

A — SPROCKET DATA (Continued)							
No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.*	Square in.	Round (mm)*	Square (mm)
STAINLESS STEEL SPROCKETS							
8 (7.61%)	1.6 (41)	1.6 (41)	0.164 (4)	3/4**	5/8	(20)**	
12 (3.41%)	2.3 (58)	2.3 (58)	0.164 (4)	1.0**	1.0	(25)**	(25)
SPLIT SPROCKETS							
18 (1.54%)	3.5 (89)	3.5 (89)	1.7 (43)		1.5		(40)
24 (0.86%)	4.6 (117)	4.7 (119)	1.7 (43)		1.5		(40)
26 (0.73%)	5.1 (130)	5.1 (130)	1.7 (43)	1 1-3/16 1-1/4	1.5 2.5		(40) (60)
32 (0.48%)	6.1 (155)	6.2 (157)	1.7 (43)	1 1-3/16 1-1/4	1.5 2.5		(40) (60)
FLUSH GRID ONLY MOULDED SPROCKETS							
24 (0.86%)	4.6 (117)	4.7 (119)	1.7 (43)		1.5		(40)
32 (0.48%)	6.1 (155)	6.2 (157)	1.7 (43)	1 1-3/16 1-1/4	1.5 2.5		(40) (60)

* Round bore moulded and split sprockets are frequently furnished with two keyways. Use of two keys is NOT REQUIRED nor recommended. Round bore sprockets do not have set screws for locking the sprockets in place. As with square bore sprockets, only the centre-most sprocket needs to be locked down. Key sizes on round bore sprockets conform to ANSI standard B17.I-1967, R1989 and DIN6885.

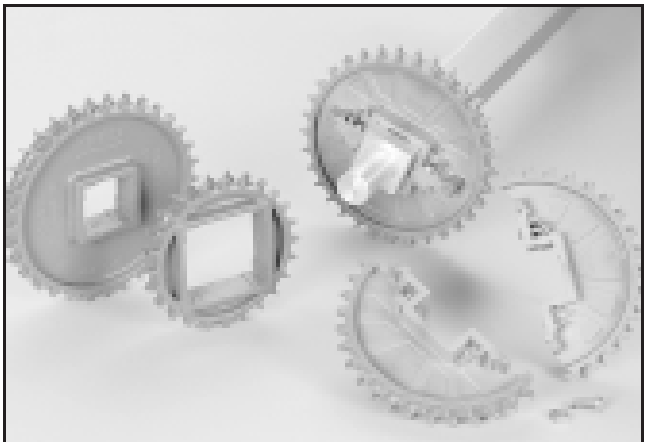
** The stainless steel sprockets have a male key in the round bore sizes (see the drawing of the 8 tooth sprocket at the top of this page). Since the key is part of the sprocket, only the centre sprockets should be locked down to track the belt. The male key requires that the shaft keyway run the entire length of the shaft.

Call Customer Service for lead-times.

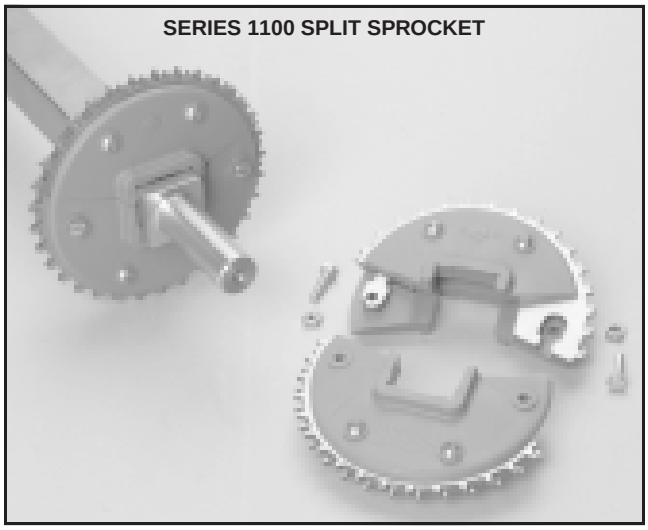
Series 1100 split sprockets are constructed of 304 stainless steel tooth bearing plates sandwiched between bore specific, polypropylene hubs. For acid applications, the plates may be made of 316 stainless steel. Stainless steel teeth are generally more abrasion resistant than plastic teeth, thus increasing normal sprocket life. Split sprockets are constructed of FDA compliant materials.

Installing or removing split sprockets (sub-assembled by Intralox) is accomplished using only two bolts. On new equipment, shafts can be mounted and plumbed before sprocket installation. On existing equipment, sprockets may be replaced without removing the shafts. Split sprockets and moulded sprockets can be used together on the same shaft.

Special pitch diameters and bore sizes are available if the application cannot use the standard sizes listed above.



SERIES 1100 FLUSH GRID ONLY MOULDED SPROCKET



SERIES 1100 SPLIT SPROCKET

B — SHAFT DATA				
SIZE	Q SHAFT WEIGHT, lb/ft (kg/m)			I
	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	MOMENT OF INERTIA in.^{4} (mm^4)
5/8 IN. SQUARE	0.46 (0.68)	1.33* (1.98)	1.33* (1.98)	0.013 (5,400)
1 IN. SQUARE	1.17* (1.74)	3.40* (5.06)	3.40* (5.06)	0.083 (34,600)
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (5.06)	0.42 (175,600)
2.5 IN. SQUARE	7.34 (10.92)	21.25* (31.62)	21.25* (31.62)	3.25 (1,355,000)
25 mm SQUARE	(1.70) 1.14	(4.92)** 3.31	(4.92)** 3.31	(32,550) 0.078
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
60 mm SQUARE	(10.05) 6.75	(29.11)** 19.56	(29.11)** 19.56	(1,080,000) 2.78
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

* Intralox USA offers square shafting in these materials and sizes.
** Intralox Europe offers square shafting in these materials and size

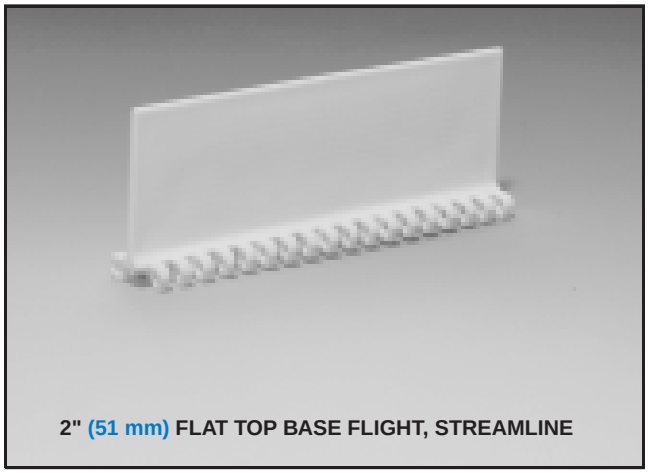
BELT ACCESSORIES

FLIGHTS — Series 1100 Flat Top base streamline flights are available in 2 in. (51 mm) high and can be cut down to any height to meet customer requirements. Each flight rises out of the centre of its supporting module, moulded as an integral part. No fasteners are required. The minimum indent (without sideguards) is 2.0 in. (51 mm). The Flat Top base streamline flights are used in both Flat Top and Flush Grid belts.

SIDEGUARDS — Sideguards are used to assure product containment and are available 2 in. (51 mm) high. They are of the standard overlapping design and are an integral part of the belt, with no fasteners required. The minimum indent is 1.3 in. (33 mm). The standard gap between the sideguards and the edge of a flight is 0.2 in. (5 mm). When going around the 8, 12, 16 and 18 tooth sprockets, the sideguards will fan out, opening a gap at the top of the sideguard which might allow small products to fall out. The sideguards stay completely closed when wrapping around the 24 tooth and larger sprockets.

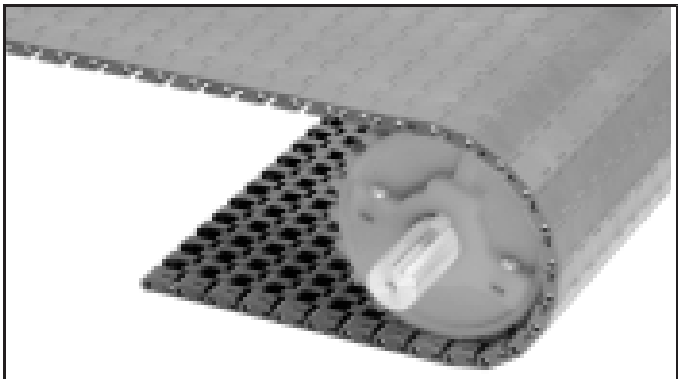
SERIES 1100 ACCESSORIES (Nominal Dimensions)	
Flat Top Base Flights	**Sideguards**
2 in. (51 mm)	2 in. (51 mm)
AVAILABLE MATERIALS	
Acetal Polypropylene Polyethylene	Acetal Polypropylene Polyethylene

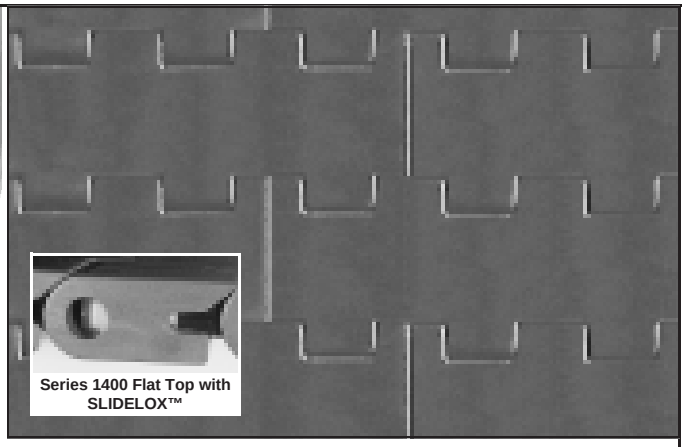
SERIES 1100 FLUSH GRID WITH FLIGHTS AND SIDEGUARDS



2" (51 mm) FLAT TOP BASE FLIGHT, STREAMLINE

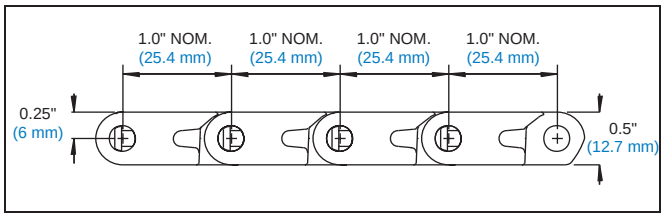
2" (51 mm) SIDEGUARD





FLAT TOP, 0% Open Area

- Nominal 1.0 in. (25.4 mm) pitch, closed hinge, centre/hinge driven.
- Smooth, closed surface with fully flush edges.
- Robust design offers excellent belt and sprocket durability, especially in tough glass applications.
- Smooth, flat top provides excellent lateral movement of containers. Ideal for container handling.
- Custom-built in widths from 5.0 in. (127 mm) and up, in approximately 1.0 in. (25.4 mm) increments. ***(See NOTE on page 1-8)***



Belt Data

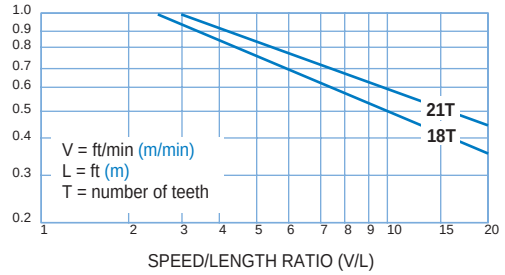
Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA Meat and Poultry	USDA Dairy*	M**
Acetal	Nylon	2500 (3720)*	-50 (-46) to 200 (93)	2.75 (13.43)	•			
Polypropylene***	Nylon	1800 (2678)	34 (1) to 220 (104)	1.85 (9.03)	•	•	White	

* USDA Dairy and MAF acceptance require the use of an clean-in-place system.
** M -MAF - New Zealand Dairy
*** Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)

(S) = smooth, clean conditions. For more information about Friction Factors, see page 2-3.

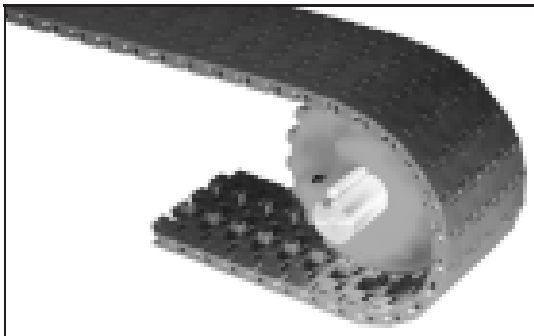
S Strength Factor

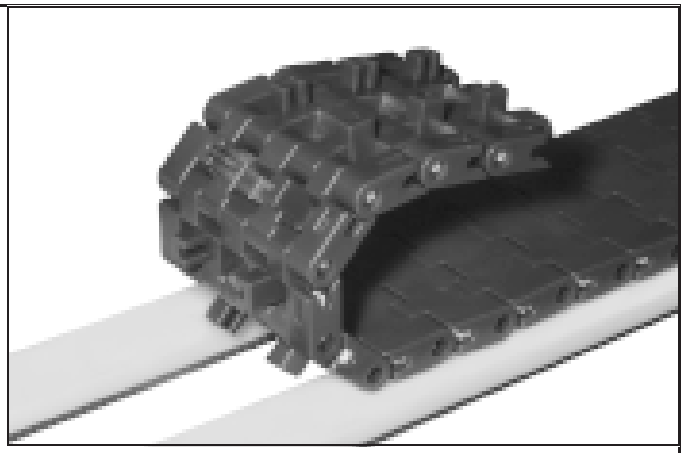


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

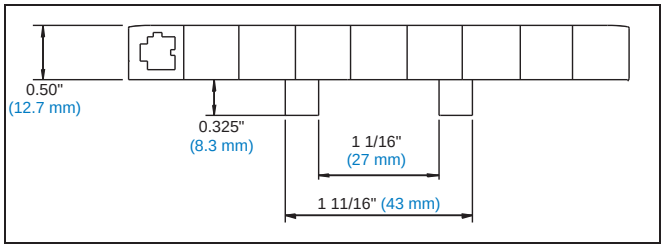
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket information for **Series 1400** is on page 2-73.
- All **Series 1400** sprockets use the split design so shafts do not have to be removed for retrofits and change overs. The **Series 1400** sprockets are all plastic.
- The **Series 1400** split sprockets are designed with thick, "lug" style teeth for excellent durability and wear life.





MOULD TO WIDTH FLAT TOP
0% Open Area

- Nominal 1.0 in. (25.4 mm) pitch, closed hinge, centre/hinge driven.
- Smooth, closed surface with fully flush edges.
- Robust design offers excellent belt and sprocket durability, especially in tough, glass applications.
- Smooth, flat top provides excellent lateral movement of containers. Ideal for container handling.
- Available in 3.25 in. (82.6 mm), 4.5 in. (114.3 mm) and 7.5 in. (190.5 mm) widths. ***(See Important NOTE on page 1-8)***
- Optional tracking tabs fit into single barrelled chain wearstrip with 1.75 in. (44.5 mm) spacing.



Belt Data

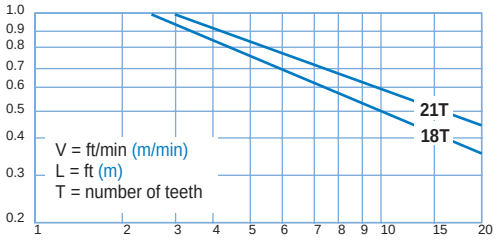
Belt Width in. (mm)	Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength* lb (kg)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)
3.25	Acetal	Nylon	700 (318)	-50 (-46) to 200 (93)	0.80 (1.19) TAB - 0.75 (1.12) NO TAB	•
4.5	Acetal	Nylon	850 (386)	-50 (-46) to 200 (93)	1.13 (1.68) TAB - 1.07 (1.59) NO TAB	•
7.5	Acetal	Nylon	1550 (703)	-50 (-46) to 200 (93)	1.75 (2.60) TAB - 1.71 (2.54) NO TAB	•

* Ratings are based on non-tabbed belts using the maximum number of sprockets.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Acetal (S)	0.10 (0.11)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. For more information about Friction Factors, see page 2-3.

S Strength Factor

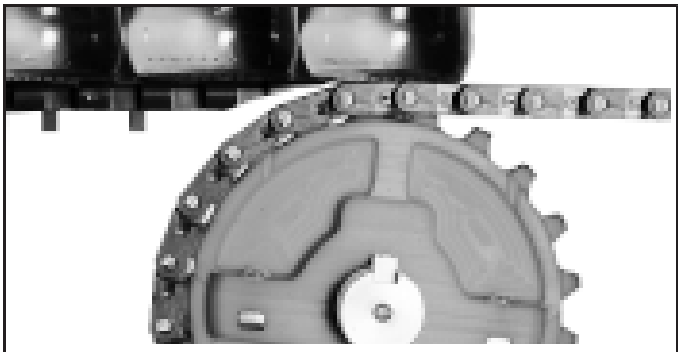


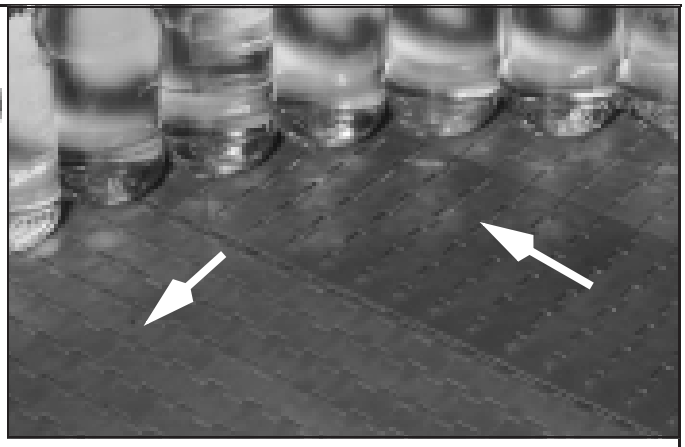
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

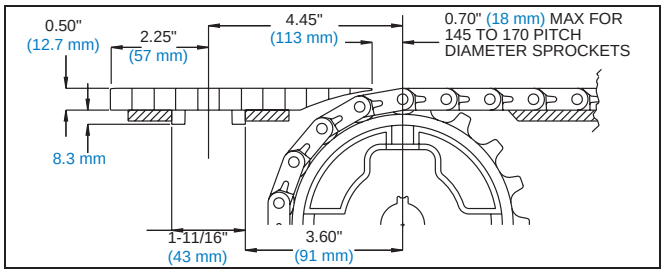
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket information for **Series 1400** is on page 2-73.
- One sprocket can be placed on the 3.25 in. (82.6 mm) mould to width belt and the 4.5 in. (114.3 mm) tabbed mould to width belt. One or two sprockets can be placed on the 4.5 in. (114.3 mm) no tab mould to width belt. Up to three sprockets can be placed on the 7.5 in. (190.5 mm) mould to width belt.
- All **Series 1400** sprockets use the split design so shafts do not have to be removed for retrofits and change overs. The Series 1400 sprockets are all plastic.
- The **Series 1400** split sprockets are designed with thick, "lug" style teeth for excellent durability and wear life.
- Width tolerances for the **Series 1400 Mould To Width** belts are +0.000/-0.020 in. (+0.000/-0.500 mm).
- **Series 1400 Mould To Width** belts are boxed in 10 ft. (3.05 m) increments.





ONEPIECE™ LIVE TRANSFER FLAT TOP 0% Open Area

- Nominal 1.0 in. (25.4 mm) pitch, closed hinge, centre/hinge-driven.
- Smooth, closed surface with fully flush edges.
- Robust design offers excellent belt and sprocket durability, especially in tough, glass applications.
- Smooth, flat top provides excellent lateral movement of containers, especially PET and glass.
- Moulded with robust tracking tabs to support belt in heavy, side-loading applications.
- Available in 6.0 in. (152.4 mm) width. ***(See NOTE on page 1-8)***



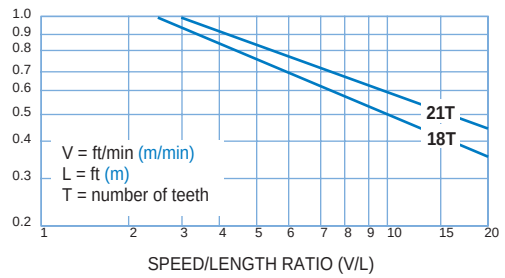
Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)		
Acetal	Nylon	850 (386)	-50 (-46) to 200 (93)	1.25 (1.86)	•		

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. For more information about Friction Factors, see page 2-3.

S Strength Factor

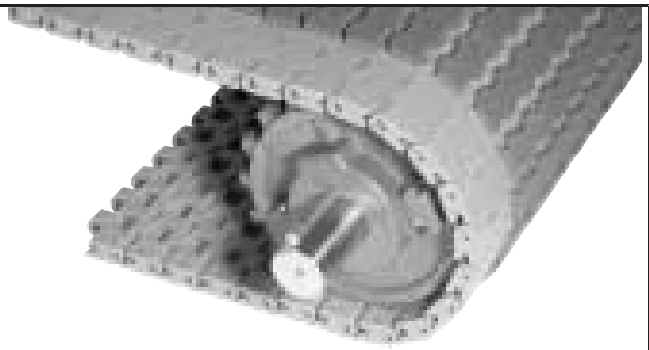


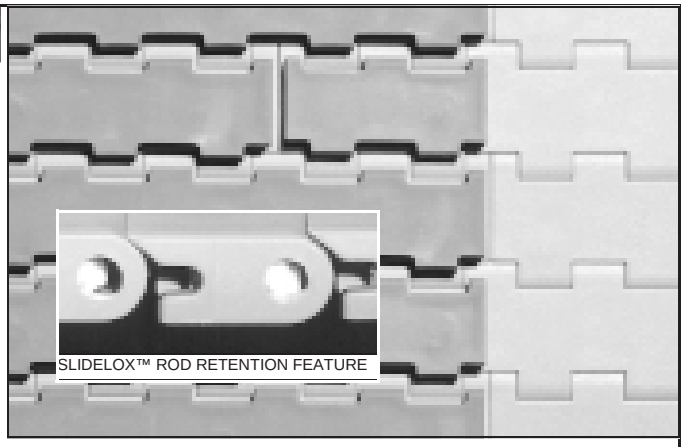
SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

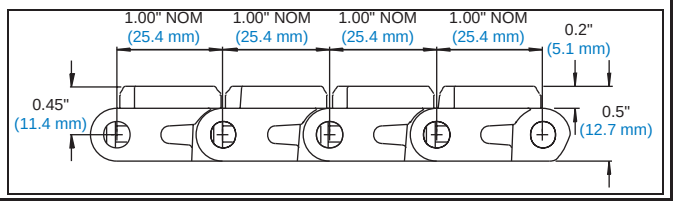
- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket information for **Series 1400** is on page 2-73.
- When product is moving from the transfer belt to a takeaway belt, the top of the transfer belt should be no more than 0.06 in. (1.5 mm) above the top of the takeaway belt. When product is moving from the infeed belt onto the transfer belt, the top of the belts should be level.
- You may need to include a fixed frame support member beneath the ONEPIECE™ Live Transfer belt prior to the actual transfer. This will insure that the ONEPIECE™ Live Transfer belt does not snag when it intersects with the takeaway belt. See Figure 3-31, on page 3-19, for an illustration.
- All **Series 1400** sprockets use the split design so shafts do not have to be removed for retrofits and change overs. The **Series 1400** sprockets are all plastic.
- The **Series 1400** split sprockets are designed with thick, "lug" style teeth for excellent durability and wear life.
- **Series 1400 Live Transfer** belts are boxed in 10 ft. (3.05 m) increments.





FLAT FRICTION TOP, 0% Open Area

- Nominal 1.0 in. (25.4 mm) pitch, closed hinge, centre/hinge driven.
- Fully flush edges with SLIDELOX™ rod retention feature.
- Robust design offers excellent belt and sprocket durability, especially in tough, material handling applications.
- Custom-built in widths from 6.0 in. (152.4 mm) and up, in approximately 1.0 in. (25.4 mm) increments. (See ***NOTE on page 1-8)***



Belt Data

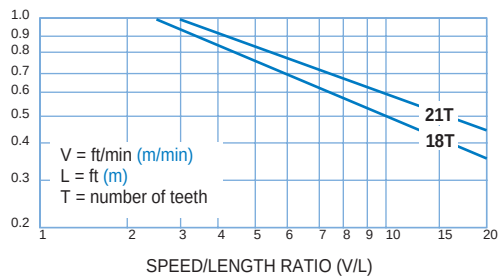
Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Belt Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)		
Polypropylene*	Nylon	1800 (2678)	34 (1) to 150 (66)	2.50 (12.16)	White		

* Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.13 (0.11)	0.11 (0.09)	0.25 (0.26)	0.26 (0.26)	THESE PRODUCTS ARE NOT RECOMMENDED FOR BACK-UP CONDITIONS. IF VALUES ARE REQUIRED, CONTACT INTRALOX SALES ENGINEERING.				
Polypropylene (A)	NR	NR	0.30 (0.30)	0.31 (0.31)					

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended.

S Strength Factor



SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket information for **Series 1400** is on page 2-73.
- All Series 1400 sprockets use the split design so shafts do not have to be removed for retrofits and change overs.
- Dark grey rubber has a hardness of 64 Shore A. White rubber has a hardness of 55 Shore A.
- If a centre-drive set up is used, it may be necessary to place collars to laterally retain the belt at the backbend roller before the drive.
- Temperature, environmental conditions and product characteristics affect the effective maximum degree of incline. Take these items into consideration when designing conveyor systems utilizing these belts.

Intralox has all plastic split sprockets for **Series 1400** with 18 and 21 teeth. Intralox can machine sprockets with different numbers of teeth if the application cannot use standard sizes. The standard sprocket dimensions are listed in Table A. Shaft information is listed in Table B.

The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

The torque range for the hardware in the split sprocket is 55 to 75 in-lb (6.2 to 8.5 N-m) for the 4 bolts and 45 to 55 in-lb (5.1 to 6.2 N-m) for the set screw.

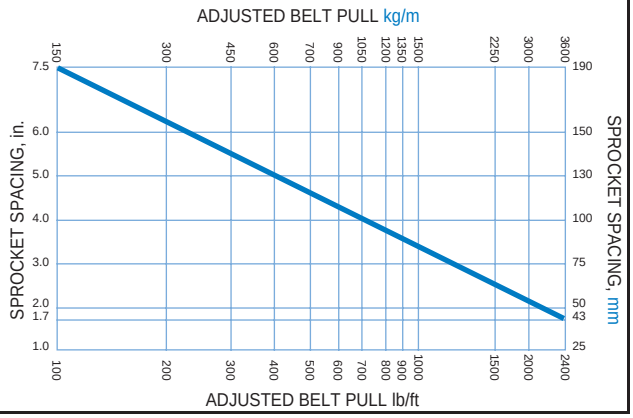
SPROCKET AND SUPPORT QUANTITY REFERENCE

Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
5 (127)	2	2	2
6 (152)	2	2	2
7 (178)	2	3	2
8 (203)	2	3	2
10 (254)	2	3	2
12 (305)	3	3	2
14 (356)	3	4	3
16 (406)	3	4	3
18 (457)	3	4	3
20 (508)	5	5	3
24 (610)	5	5	3
30 (762)	5	6	4
32 (813)	7	7	4
36 (914)	7	7	4
42 (1067)	7	8	5
48 (1219)	9	9	5
54 (1372)	9	10	6
60 (1524)	11	11	6
72 (1829)	12	13	7
84 (2134)	15	15	8
96 (2438)	17	17	9
For Other Widths, Use Odd Number of Sprockets** at Maximum 6 in. (152 mm) ℄ Spacing		Maximum 6 in. (152 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

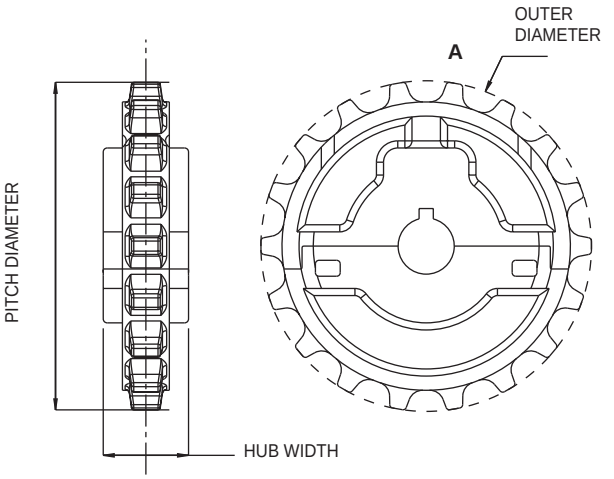
* NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications

** The centre sprocket should be locked down. With only two sprockets, fix the sprocket on the drive journal side only.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



SERIES 1400 18 TOOTH SPROCKET



A — SPROCKET DATA

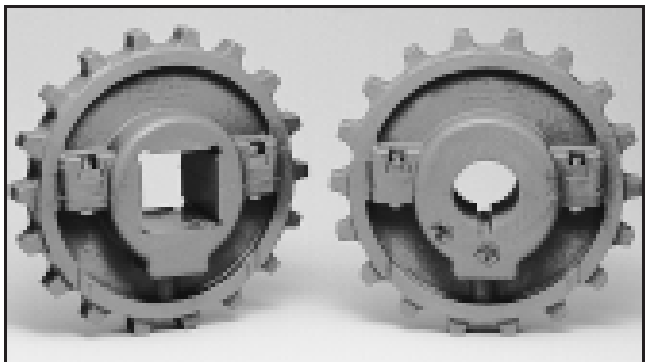
No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.	Square in.	Round (mm)	Square (mm)
SPLIT SPROCKET							
16 (1.88%)	5.1 (130)	5.2 (132)	1.96 (50)	1" to 2" in 1/16" increments	1.5	25 mm to 50 mm in 5 mm increments	(40)
					2.5		-
18 (1.52%)	5.7 (145)	5.8 (148)	1.96 (50)	1" to 2" in 1/16" increments	1.5	25 mm to 50 mm in 5 mm increments	(40)
					2.5		(60)
21 (1.12%)	6.7 (170)	6.8 (172	1.96 (50)	1" to 2" in 1/16" increments	1.5	25 mm to 50 mm in 5 mm increments	(40)
					2.5		(60)
Call Customer Service for lead-times.							

B — SHAFT DATA

SIZE	Q SHAFT WEIGHT, lb/ft (kg/m)			I MOMENT OF INERTIA in.^{4} (mm^4)
	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (5.06)	0.42 (175,600)
2.5 IN. SQUARE	7.34 (10.92)	21.25* (31.62)	21.25* (31.62)	3.25 (1,355,000)
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
60 mm SQUARE	(10.05) 6.75	(29.11)** 19.56	(29.11)** 19.56	(1,080,000) 2.78
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

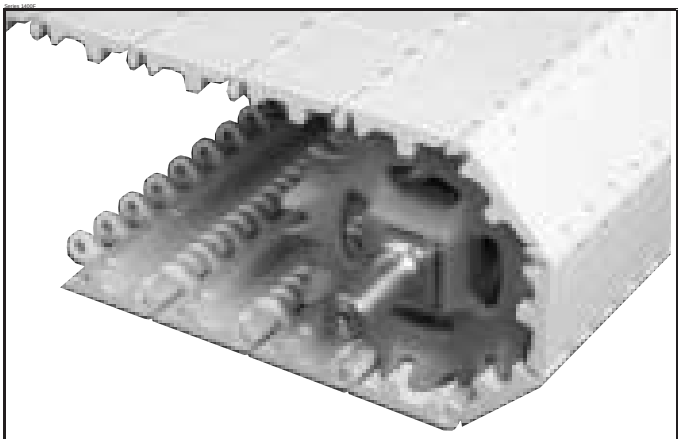
* Intralox USA offers square shafting in these materials and sizes.

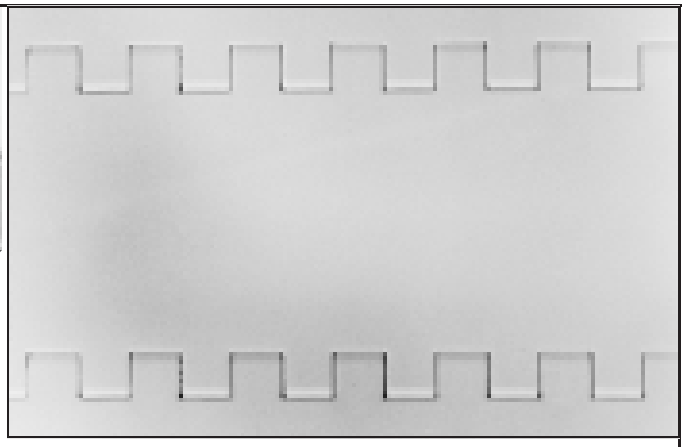
** Intralox Europe offers square shafting in these materials and size



SERIES 1400 GLASS-FILLED NYLON SQUARE BORE AND ROUND BORE SPLIT SPROCKETS

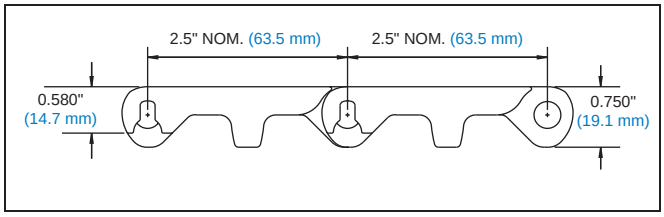
1400





FLAT TOP, 0% Open Area

- Nominal 2.5" (63.5 mm) pitch, centre-driven, open hinge.
- Smooth, closed upper surface with fully flush edges and recessed rods.
- Impact resistant belt designed for abusive applications.
- Custom-built in widths from 5 in. (127 mm) and up, in approximately 1.0" (25.4 mm) increments. (See ***NOTE on page 1-8)***



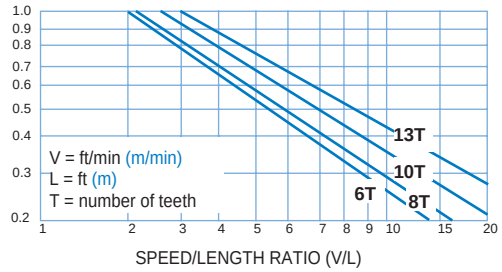
Belt Data

Belt Material	Standard Rod Material ∅ 0.312 in. (7.9 mm)	BS Belt Strength lb/ft (kg/m)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability* FDA (USA)
Polypropylene**	Polypropylene	1400 (2083)	34 (1) to 200 (93)	2.23 (10.90)	•
Polypropylene	Polyethylene	700 (1042)	-50 (-46) to 150 (66)	2.06 (10.06)	•
Acetal	Polyethylene	1500 (1768)	-50 (-46) to 150 (66)	3.36 (16.40)	•
Acetal	Polypropylene	1200 (2232)	34 (1) to 200 (93)	3.36 (16.40)	•

* Prior to Intralox's development of the Series 1800, USDA Meat and Poultry discontinued publishing a list of acceptable new products designed for food contact. As of the printing of this literature, third party approvals are being investigated, but are not yet sanctioned by the USDA.
** Do not use PP in high impact conditions below 7°C.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	-- (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	-- (0.21)	0.40 (0.40)
Polyethylene (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	-- (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.03 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	-- (0.18)	0.33 (0.27)
(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR= not recommended									

S Strength Factor



Divide belt speed "V" by the shaft $\mathcal{L}$ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket information for **Series 1800** is on pages 2-76.
- 4 in. (101.6 mm) MOULDED impact resistant flights available.
- Easy retrofit from **Series 800** without extensive conveyor frame changes for most applications since the A,B,C,E dimensions are within 1/4" (6 mm) of **Series 800**.

Intralox has moulded sprockets for **Series 1800** with 6, 8, 10, and 13 teeth. Intralox can machine sprockets with different numbers of teeth if the application cannot use standard sizes. The standard sprocket dimensions are listed in Table A.

The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

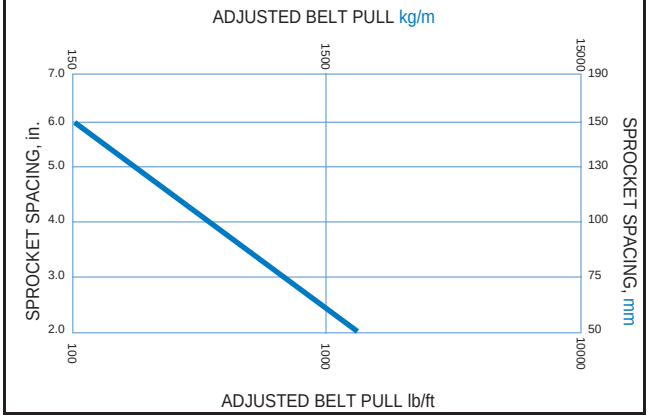
SPROCKET AND SUPPORT QUANTITY REFERENCE

Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
5 (127)	1	2	2
6 (152)	2	2	2
7 (178)	2	2	2
8 (203)	2	2	2
9 (203)	2	2	2
10 (254)	2	3	2
12 (305)	3	3	2
14 (356)	3	3	3
15 (381)	3	3	3
16 (406)	3	3	3
18 (457)	3	3	3
20 (508)	3	4	3
24 (610)	5	4	3
30 (762)	5	5	4
32 (813)	5	5	4
36 (914)	7	5	4
42 (1067)	7	6	5
48 (1219)	9	7	5
54 (1372)	9	7	6
60 (1524)	11	8	6
72 (1829)	13	9	7
84 (2134)	15	11	8
96 (2438)	17	12	9
For Other Widths, Use Odd Number of Sprockets** at Maximum 6 in. (152 mm) ℄ Spacing		Maximum 9 in. (229 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

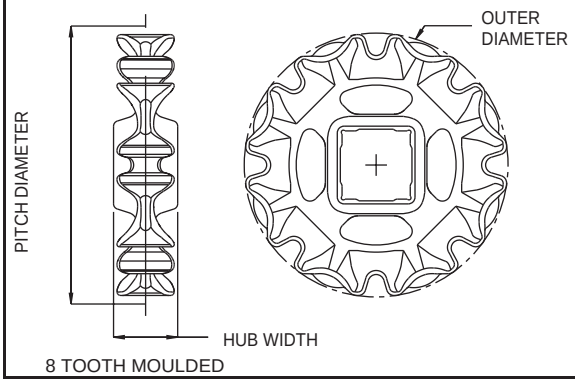
* NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications

** The centre sprocket should be locked down. With only two sprockets, fix the sprocket on the drive journal side only.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



SERIES 1800 SPROCKET



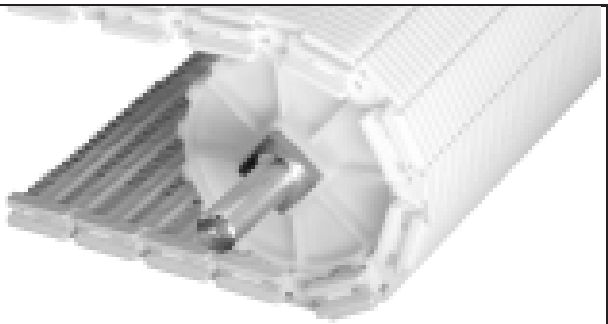
A - SPROCKET DATA

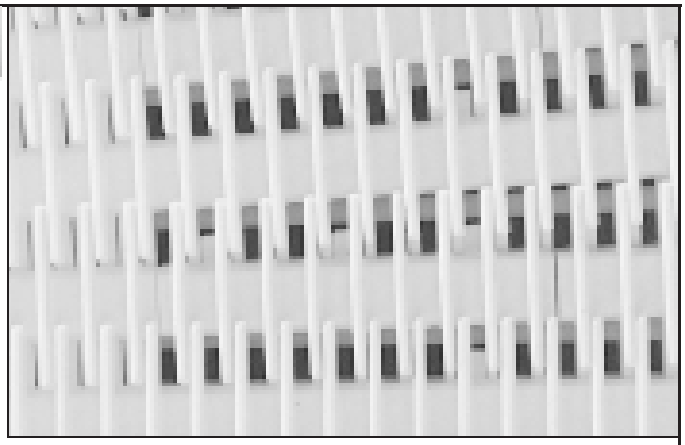
No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Hub Sizes	
				U.S. Sizes Square in.	Metric Sizes Square (mm)
EZ CLEAN MOULDED SPROCKETS					
6 (13.4%)	5.0 (127)	4.6 (117)	1.5 (38)	1.5	(40)
8 (7.61%)	6.5 (165)	6.2 (157)	1.5 (38)	1.5	(40)
10 (4.89%)	8.1 (206)	7.8 (198)	1.5 (38)	1.5	(40)
13 (2.91%)	10.5 (267)	10.3 (262)	1.5 (38)	1.5	(40)
Contact Customer service for lead-times					

BELT ACCESSORIES

FLIGHTS — Series 1800 Flat Top impact resistant flights are available in 4 in. (102 mm) high and can be cut down to any height, 0.5 in. (13 mm) minimum, to meet customer requirements. Each flight rises out of the centre of its supporting module, MOULDED as an integral part. No fasteners are required.

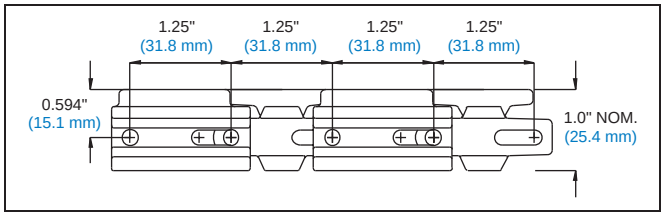
SERIES 1800 ACCESSORIES (Nominal Dimensions)
Impact Resistance Flights
4 in. (102 mm)
AVAILABLE MATERIALS
Acetal Polypropylene Polyethylene





RAISED RIB
18% Open Area
29% Product Contact Area
USDA accepted (Meat and Poultry)

- Opening size (approximate): 0.25 in. (6.4 mm) x 0.25 in. (6.4 mm).
- Available for radius or low-tension spiral cooling applications.
- Centre-driven, nominal 1.25 in. (31.8 mm) pitch, sideflexing belt with flush edges and recessed rods.
- Designed for applications with a minimum turning radius of 2.2 times belt width (measured from inside edge, with a minimum radius of 18 in. [457 mm]).
- Finger Transfer Plates are available.
- Custom-built in widths from 3.6 in. (91.4 mm) and up, in approximately 0.33 in. (8.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in. (4.6 mm)	BS Straight Belt Strength lb/ft (kg/m)	Curved Belt Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	Agriculture Canada
Polypropylene*	Polypropylene	500 (750)	65 (29)	34 (1) to 220 (104)**	1.75 (8.53)	•	•	•
Polyethylene	Polyethylene	400 (605)	40 (18)***	-50 (-46) to 150 (66)	1.83 (8.92)	•	•	•
Acetal	Polypropylene	1130 (1680)	100 (45)***	34 (1) to 200 (93)**	2.68 (13.08)	•	•	•

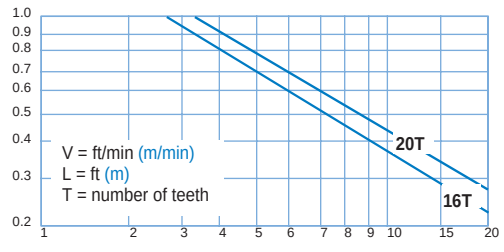
* Do not use PP in high impact conditions below 7°C.
** Sideflexing applications should not exceed 180 °F (82 °C). *** Radius only.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

S Strength Factor



Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 2000** is on pages 2-78 to 2-79.
- The Intralox Engineering Program will help predict the strength requirements of most radius applications, insuring that the belt is strong enough for the application.
- Raised Rib surface provides support for delicate products and allows air to reach as much as 70% of the product's bottom surface.
- Top and bottom drive sprockets are available, allowing the belt to be run "upside down", using the centre beam as a small rib.
- Polypropylene, polyethylene and acetal are available for radius applications.
- Polypropylene is available for low tension spiral cooling systems.

Intralox has sprockets for **Intraflex 2000** with 16 and 20 teeth. Intralox can machine plastic sprockets with different numbers of teeth if the application cannot use the standard sizes. **Intraflex 2000** sprockets are bi-directional, so they cannot be placed incorrectly on the shaft. The dimensions for the standard sprockets are listed in Table A. Shaft information is listed in Table B.

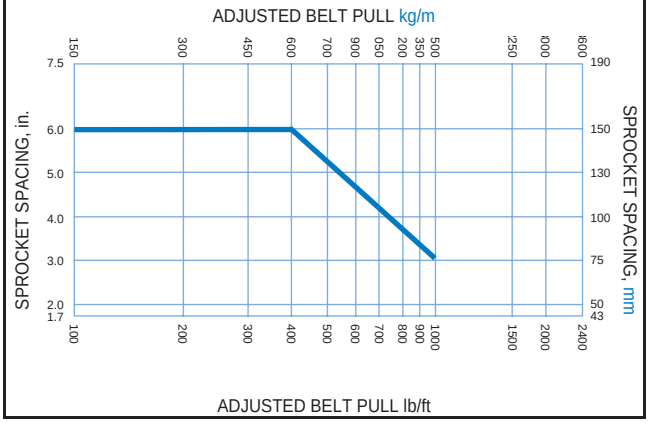
The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

SPROCKET AND SUPPORT QUANTITY REFERENCE

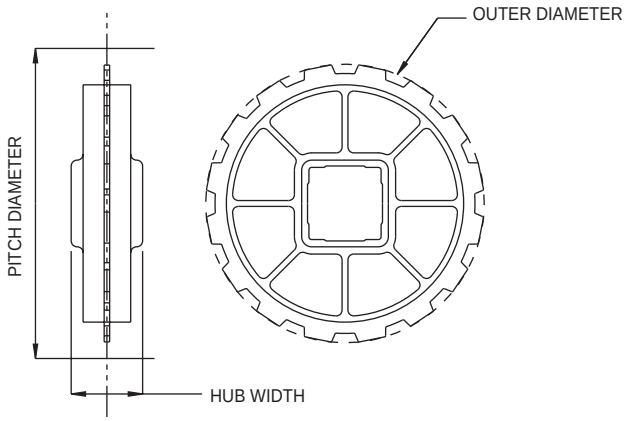
Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	Wearstrips	
		Carryway	Returnway
4 (102)	1	2	2
6 (152)	2	2	2
7 (178)	2	2	2
8 (203)	2	2	2
10 (254)	2	3	2
12 (305)	3	3	2
14 (356)	3	3	3
15 (381)	3	3	3
16 (406)	3	3	3
18 (457)	3	3	3
20 (508)	5	4	3
24 (610)	5	4	3
30 (762)	5	5	3
32 (813)	7	5	4
36 (914)	7	5	4
For Other Widths, Use Odd Number of Sprockets** at Maximum 6 in. (152 mm) ℄ Spacing		Maximum 9 in. (229 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

*NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications.
** All bottom drive sprockets should be locked down.

SPROCKET SPACING AS A FUNCTION OF BELT PULL

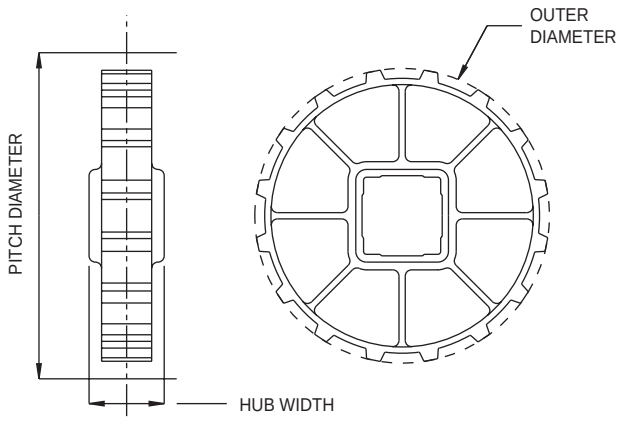


INTRAFLEX 2000 16 TOOTH TOP DRIVE SPROCKET



INTRAFLEX 2000 16 TOOTH BOTTOM DRIVE SPROCKET

All bottom drive sprockets must be locked down



A — MOULDED SPROCKET DATA

No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes		
				U.S. Square in.	Metric Square (mm)	Belt Surface
16 (1.92%)	6.5 (165)	5.9 (150)	1.5 (38)	1.5	(40)	Top or Bottom (Specify)
20 (1.23%)	8.1 (206)	7.5 (191)	1.5 (38)	1.5	(40)	Bottom

Call Customer Service for lead-times.

B — SHAFT DATA

SIZE	Q SHAFT WEIGHT, lb/ft (kg/m)			I MOMENT OF INERTIA in.⁴ (mm⁴)
	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (5.06)	0.42 (175,600)
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

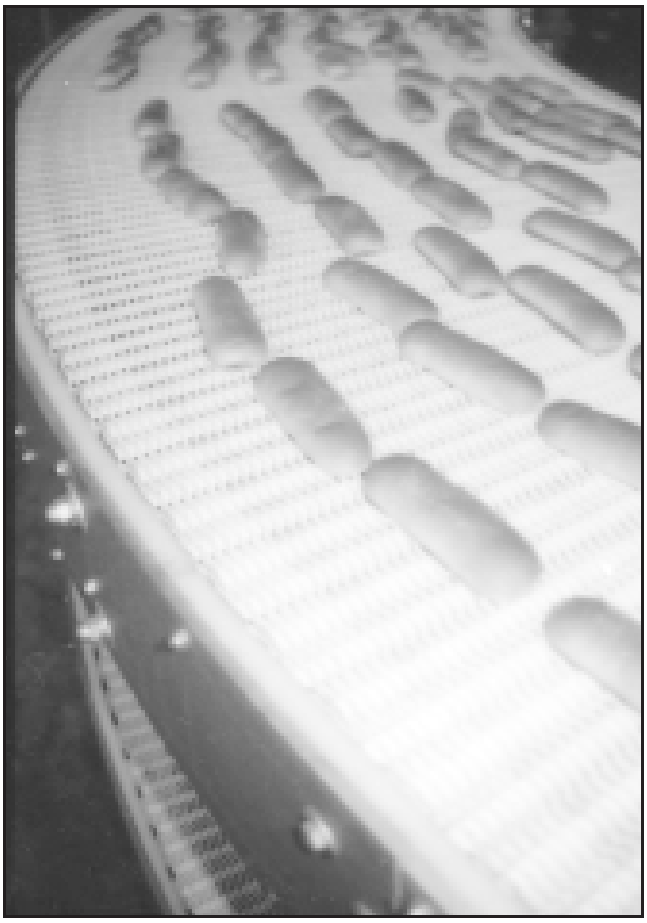
*Intralox USA offers square shafting in these materials and sizes.
**Intralox Europe offers square shafting in these materials and size

2000

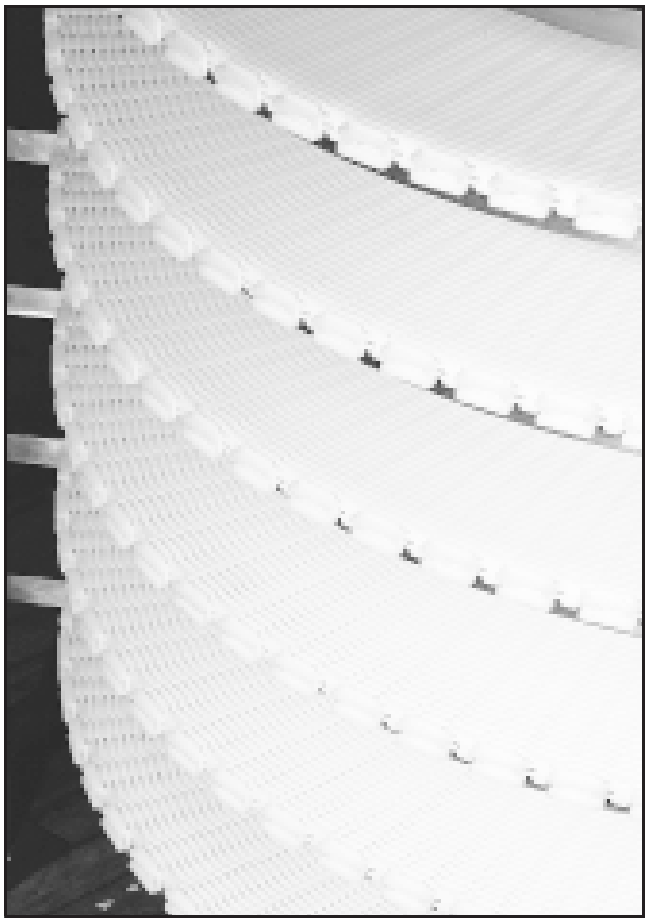
BELT ACCESSORIES

FINGER TRANSFER PLATES — These comb-like plates are designed to be used with **Intraflex 2000 Raised Rib** belts to eliminate product transfer and tipping problems. The 18 fingers extend between the belt's ribs allowing a smooth continuation of the product flow as the belt engages its sprockets. Finger Transfer Plates are installed easily on the conveyor frame with the shoulder bolts supplied. Caps snap easily into place over the bolts, keeping foreign material out of the slots. See Section Three, **Design Guidelines**, for installation instructions.

6" (152 mm) FINGER TRANSFER PLATE



SERIES 2000 RAISED RIB IN A RADIUS APPLICATION



SERIES 2000 RAISED RIB IN A SPIRAL COOLING CAGE

HOLD DOWN RAILS AND WEARSTRIPS

Intralox recommends using continuous hold down rails through an entire turn, starting at a distance of 1x the belt width before the turn and ending 1x the belt width after the turn. This applies to both carryway and returnway. The use of hold down rails along both sides of the belt, over the full carryway, is recommended but not mandatory. Intralox offers two wearstrip styles that are commonly used with **Intraflex 2000** as hold down rails. See page 2-99 for more wearstrip information.

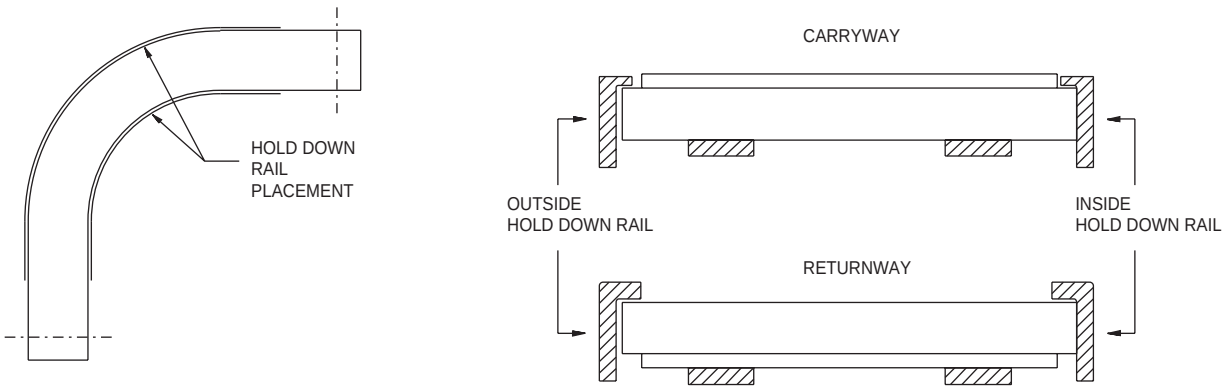


FIG. 2-1 **HOLD DOWN RAILS AND WEARSTRIPS FOR INTRAFLEX 2000 FLAT-TURNS**

BELT SELECTION INSTRUCTIONS

ENGINEERING PROGRAM ANALYSIS FOR SERIES 2000

Intralox's Engineering Program (Version 7.4 and later) can calculate the estimated belt pull for radius applications using **Series Intraflex™ 2000**. To run the program, the following information is required (refer to page 4-23 for the Radius Belt Data Sheet):

- Any environmental conditions which may affect the friction coefficient (for dirty or abrasive conditions, use higher friction coefficients than normal)
- Belt width
- Length of each straight run
- Turning angle of each turn
- Turn direction of each turn
- Inside turning radius of each turn
- Carryway/hold down rail material
- Product loading (kg/m²)
- Product back-up conditions
- Belt speed
- Elevation changes on each section
- Operating temperatures.

For assistance with radius belt selection, contact Intralox Customer Service or Sales Engineering departments. The Engineering Program should be run to insure that the belt is strong enough for the radius application in question. Contact Customer Service for a copy of the latest version of the Engineering Program.

INTRAFLEX 2000 DESIGN GUIDE SUMMARY

For more information, see the ***Radius Belt Design Guidelines and Installation Instructions for Intraflex™ 2000, Series 2200 and Series 2400***.

A - The minimum turning radius for Intraflex 2000 is 2.2 times the belt width, measured from the inside edge. (18 in. [457 mm] is the absolute minimum turning radius.)

B - The minimum straight run required between turns of opposing direction is 2.0 times the belt width. Shorter straight sections will lead to high wear on the edge guide rail and high pull stresses in the belt.

C - There is no minimum straight run required between turns that are in the same direction.

D - The minimum length for the final straight run (leading into the drive shaft) is 1.5 times the belt width (1500 mm recommended). Shorter lengths may lead to sprocket wear or tracking problems. For narrow belts, a weighted take-up may be required since proper catenary cannot be achieved. See page 3-9 for more information.

E - The minimum length of the first straight run (immediately after the idle shaft) is 1.5 times the belt width. When shorter lengths are required (down to 1.0 times the width), an idle roller may be used in place of sprockets.

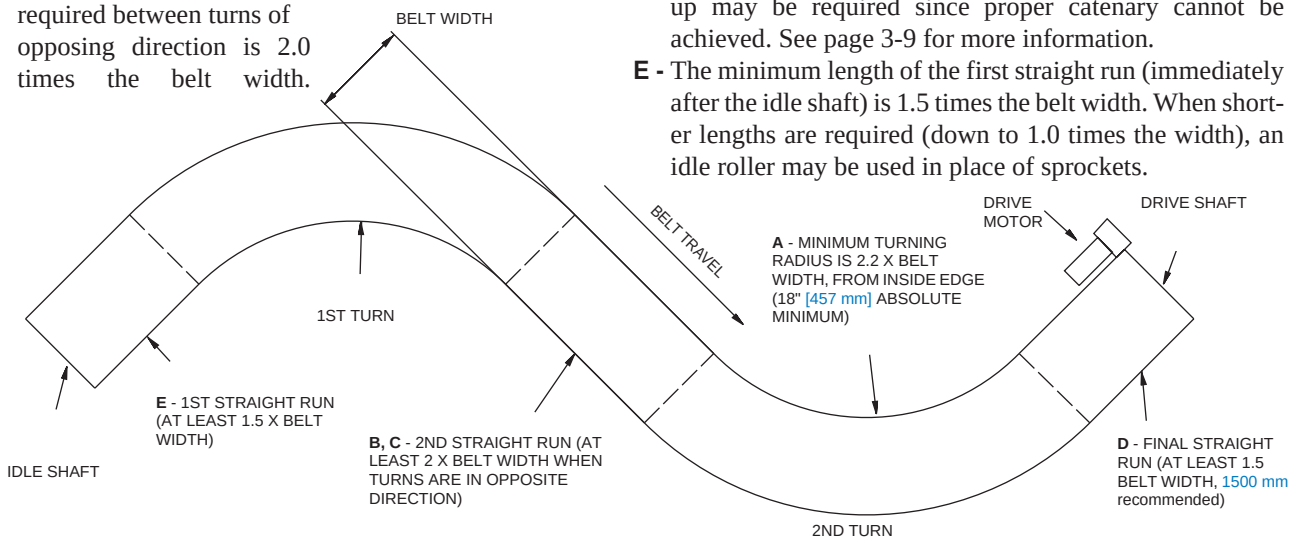
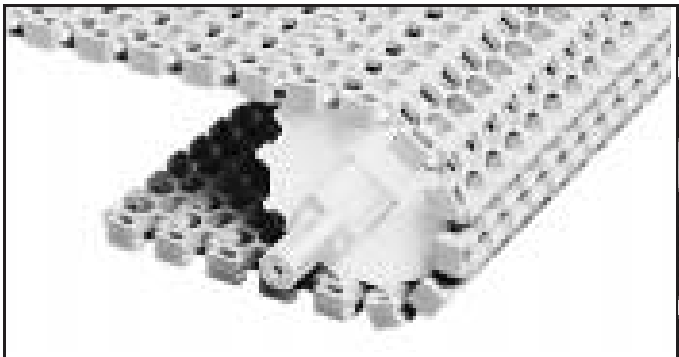
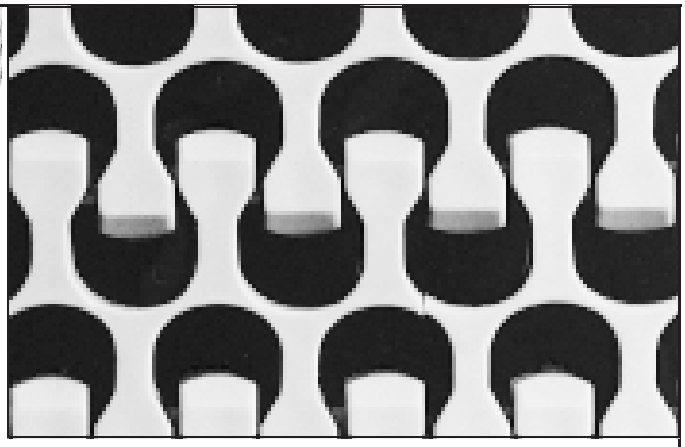


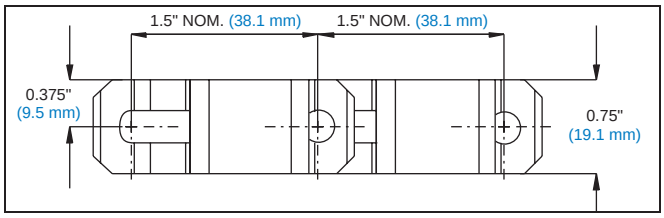
FIG. 2-2 **TYPICAL 2-TURN RADIUS LAYOUT**





FLUSH GRID, 50% Open Area
USDA accepted (Meat and Poultry, and Dairy)

- Opening size (approximate): 0.5 in. (12.7 mm) x 0.75 in. (19.7 mm).
- Hinge-driven, nominal 1.5 in. (38.1 mm) pitch, with either flush or tab edges.
- Designed for radius applications with a minimum turning radius of 2.2 times belt width (measured from inside edge).
- Lightweight, relatively strong belt with smooth surface grid.
- Custom-built in widths from 5 in. (127 mm) and up, in approximately 1 in. (25.4 mm) increments. ***(See Important NOTE on page 1-8)***



Belt Data

Belt Material	Standard Rod Material ∅ 0.24 in. (6.1 mm)	BS Straight Belt Strength lb/ft (kg/m)	Curved Belt Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/sq ft (kg/sq m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	USDA Dairy****	Agriculture Canada	1M	1A
Polypropylene*	Acetal	1600 (2380)	350 (159)	34 (1) to 200 (93)**	1.86 (9.10)	•	•	White	•	•	
Polyethylene	Acetal	1000 (1490)	200 (91)	-50 (-46) to 150 (66)	1.96 (9.56)	•	•	Natur	•	•	•
Acetal	Nylon	2500 (3720)	350 (159)	-50 (-46) to 200 (93)*	2.82 (13.80)	•	•	Natur	•		•
Polypropylene	Polypropylene***	1400 (2100)	200 (91)	34 (1) to 220 (104)*	1.78 (8.69)	•	•	White	•		

* Do not use PP in high impact conditions below 7°C. ** Sideflexing applications should not exceed 180 °F (82 °C). *** Polypropylene rods can be installed in polypropylene belts when extra chemical resistance is required. Please note lower belt strength. ****USDA Dairy and MAF acceptance require the use of a clean-in-place system. 1M - MAF - New Zealand Dairy A - Australian Quarantine Inspection Service

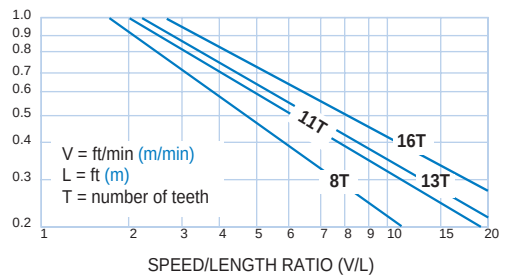
Friction Factors	Fw Friction between wearstrip and belt Wearstrip material				Fp Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINUM WET (DRY)
Polypropylene	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene* (S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.08 (0.09)	0.10 (0.13)	0.08 (0.08)	— (0.15)	0.20 (0.24)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended. For more information about Friction Factors, see page 2-3.

* Polyethylene is not recommended for container handling

t

S Strength Factor

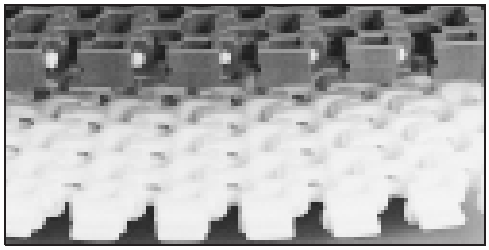


Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

WARNING: Series 2200 belts are designed for radius applications. The belt modules have wide openings, to allow for optimal articulation while turning. In order for this belt to be used in many applications, the pitch is 38,1 mm and the opening size is 12,7 mm x 19,7 mm. Like every piece of industrial equipment subject to movement or articulation, it is recommended to take precautions, as indicated by the European safety regulations.
As soon as people are working directly on the belt and have to handle the product when doing their work, we strongly recommend using a full **UHMW plate carryway under the belt** and to install **safety screens where required, according to the CE regulations**. This is required to avoid the possibility of trapping extremities in the belt at positions where the modules move into each other or at transfer positions. Should you have any questions about a specific application with this belt, Intralox remains at your disposal.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 2200** is on pages 2-82 to 2-83. **Series 2200** sprocket placement information is on page 3-6.
- The Intralox Engineering Program will help predict the strength requirements of most radius applications, insuring that the belt is strong enough for the application.
- Belt openings pass straight through belt, making it easy to clean.
- Non sliding drive system for reduced belt and sprocket wear, and for low back-side tension.
- Tab edge belt width is measured exclusive of tabs. (Tabs extend approx. 0.5 in. (13 mm) x 0.25 in. (6 mm) thick on each side of belt, inside wearstrip).



2200

Intralox has sprockets for **Series 2200** with 8, 11, 13 and 16 teeth. Intralox can machine plastic sprockets with different numbers of teeth if the application cannot use the standard sizes. **Series 2200** sprockets are bi-directional. They cannot be placed incorrectly on the shaft. A timing hole is provided for the 11 and 13 tooth sprockets. The standard sprocket dimensions are listed in Table A.

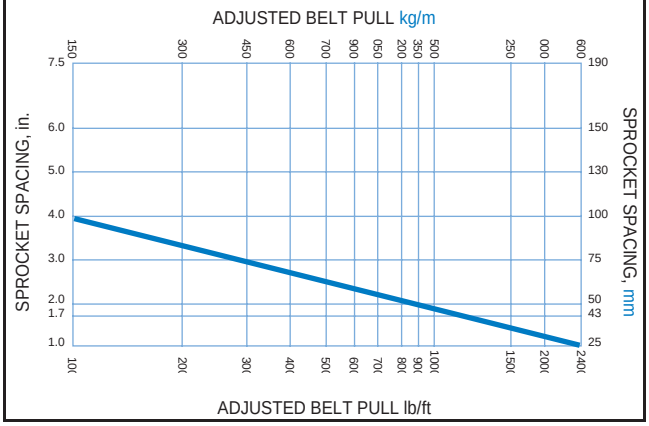
The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

SPROCKET AND SUPPORT QUANTITY REFERENCE

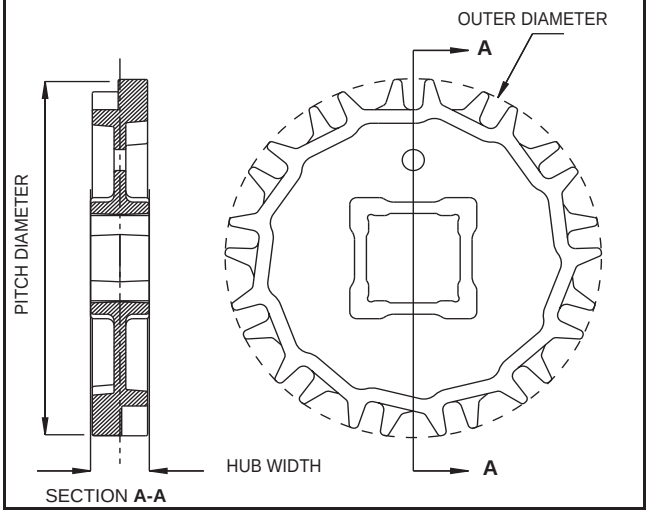
Belt Width Range in. (mm)	*Minimum Number of Sprockets Per Shaft	**Wearstrips Carryway	**Wearstrips Returnway
5 (127)	2	2	2
6 (152)	2	2	2
7 (178)	2	2	2
8 (203)	2	2	2
10 (254)	3	3	2
12 (305)	3	3	2
14 (356)	5	3	3
15 (381)	5	3	3
16 (406)	5	3	3
18 (457)	5	3	3
20 (508)	5	4	3
24 (610)	7	4	3
30 (762)	9	5	4
32 (813)	9	5	4
36 (914)	9	5	4
42 (1067)	11	6	5
48 (1219)	13	7	5
54 (1372)	15	7	6
60 (1524)	15	8	6
72 (1829)	19	9	7
84 (2134)	21	11	8
96 (2438)	25	12	11
120 (3048)	31	15	11
144 (3658)	37	17	13
For Other Widths, Use Odd Number of Sprockets at Maximum 4 in. (102 mm) ℄ Spacing		Maximum 9 in. (229 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

*NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications.
**The number of wearstrips given does not include the hold down wearstrip.

SPROCKET SPACING AS A FUNCTION OF BELT PULL



SERIES 2200 13 TOOTH SPROCKET



A — MOULDED SPROCKET DATA

No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes U.S. Sizes Round in.	U.S. Sizes Square in.	Metric Sizes Round (mm)	Metric Sizes Square (mm)
8 (6.03%)	3.9 (99)	4.0 (102)	1.0 (25)		1.5		(40)
11 (4.05%)	5.3 (135)	5.4 (137)	1.0 (25)		1.5		(40)
13 (2.91%)	6.3 (160)	6.4 (163)	1.0 (25)		1.5		(40)
					2.5		(60)
16 (1.92%)	7.7 (196)	7.8 (198)	1.0 (25)		1.5		(40)
					2.5		(60)
Call Customer Service for lead-times.							

2200

BELT ACCESSORIES

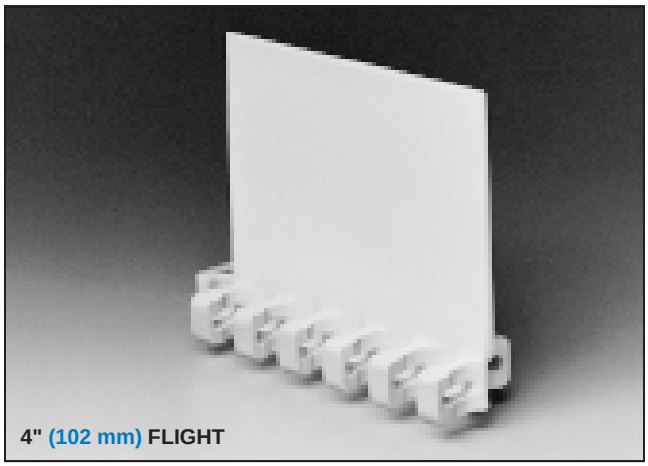
FLIGHTS — Intralox Streamline Flights are available 4 in. (102 mm) high and can be cut down to any height. Each flight rises out of the centre of its supporting module, moulded as an integral part. No fasteners are required. Flights can be provided in linear increments of 1.5 in. (38 mm). The standard indent is 5/8 in. (15.9 mm).

FRICTION MODULES — Insert modules made from high friction thermoplastic rubber (TPR) are available for **Series 2200**. Friction inserts are available in two grades, distinguishable by their colour. For industrial applications, a black module with a Shore A durometer of 45 is available. A white grade (FDA compliant) is available with a Shore A durometer of 56. The lower durometer material provides more friction but will not be as resistant to wear. The upper surface of the friction module is 0.06 in. (1.5 mm) above the surface of the rest of the belt. The underside of the module is raised 0.08 in. (2.0 mm) from the bottom surface of the belt preventing the inserts from making contact with the carryway or wearstrips. Friction modules can be used in belts 6 in. (152 mm) wide and wider. Indents range from a minimum of 2.25 in. (57 mm) to a maximum of 7.75 in. (197 mm) depending on the pre-determined pattern of each belt width. When placed at a minimum of every fourth row (6 in. [152 mm]) normal bricklay strength is maintained. The percentage of rubber will vary with belt width and linear spacing of the modules.

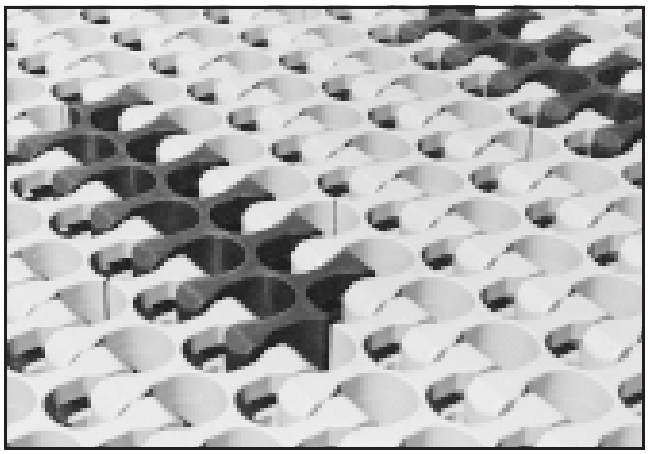
The belt strength rating of straight running belts must be reduced based on the amount of rubber in the belt, because thermoplastic rubber has no tensile strength. To obtain the downrated belt strength, multiply the straight running belt strength of the base material by the difference between total belt width and the width of the friction modules. For example, a 12 in. (305 mm) wide polypropylene belt rated at 1600 lb (726 kg) with a 5 in. (127 mm) friction module would be downrated to 930 lb (424 kg). Where the indent is less than 3.5 in. (89 mm) turning belt strength will be also reduced.

NOTES ABOUT SERIES 2200 BELTS WITH FRICTION MODULES:

- Minimum belt width is 6 in. (152 mm).
- Maximum belt width is 24 in. (610 mm).
- Minimum indent (from belt edge) is 2.25 in. (57 mm).
- Minimum linear spacing is four rows, 6 in. (152 mm).
- The returnway must be designed to eliminate rubbing contact with the friction modules.
- It is not recommended to back up product on this belt.
- End-to-end transfers at both the in-feed and discharge are recommended.
- Straight running belt strength is reduced (dependent on the number and size of the friction modules).
- Operating temperature limit is controlled by base material.
- Thermal expansion is controlled by the base material.



4" (102 mm) FLIGHT



SERIES 2200 RADIUS BELT WITH FRICTION INSERTS

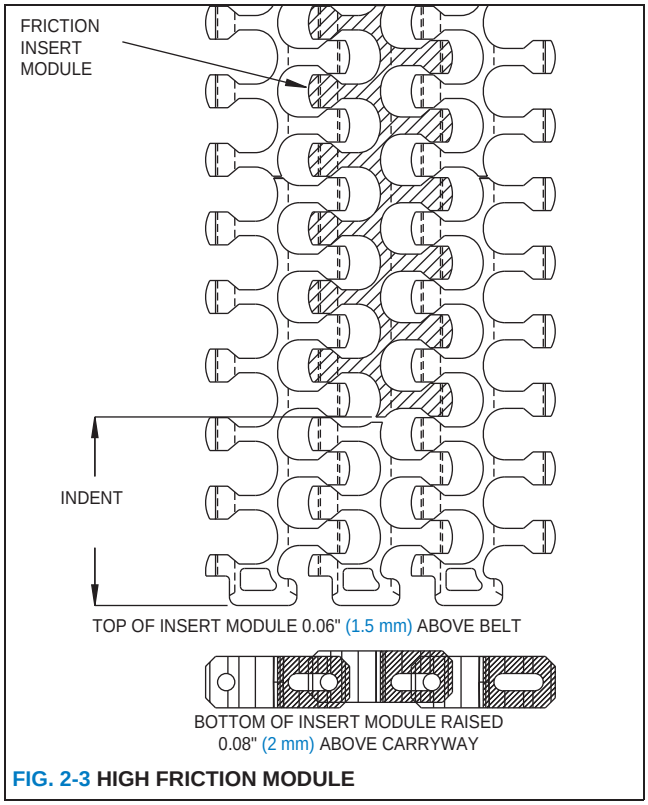


FIG. 2-3 HIGH FRICTION MODULE

2200

HOLD DOWN RAILS AND WEARSTRIPS

Intralox recommends using continuous hold down rails through an entire turn, starting at a distance of 1X the belt width before the turn and ending 1X the belt width after the turn. This applies to both carryway and returnway. The use of hold down rails along both side of the belt over the full carryway is recommended but not mandatory.

Series 2200 is available with and without an edge tab. A wearstrip style is available for each edge style. The tab edge design allows the belt to be held down without the wearstrip interfering with the carryway surface. See page 2-99 for more wearstrip information.

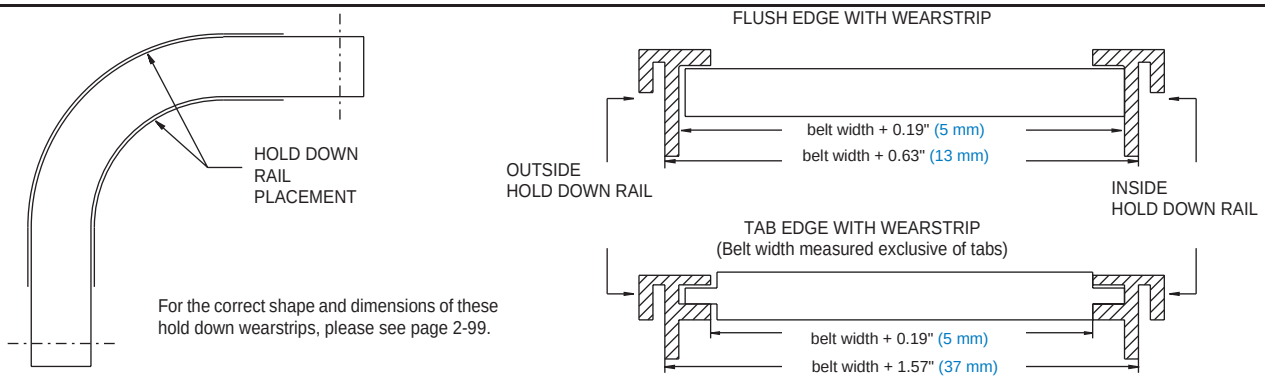


FIG. 2-4 HOLD DOWN RAILS AND WEARSTRIPS FOR SERIES 2200 FLAT-TURNS

BELT SELECTION INSTRUCTIONS

ENGINEERING PROGRAM ANALYSIS FOR SERIES 2200

Intralox's Engineering Program (Version 7.4 and later) can calculate the estimated belt pull for radius applications using **Series 2200**. To run the program, the following information is required (refer to page 4-23 for the Radius Belt Data Sheet):

- Any environmental conditions which may affect the friction coefficient (for dirty or abrasive conditions, use higher friction coefficients than normal)
- Belt width
- Length of each straight run
- Turning angle of each turn
- Turn direction of each turn
- Inside turning radius of each turn
- Carryway/hold down rail material
- Product loading (kg/m²)
- Product back-up conditions
- Belt speed
- Elevation changes on each section
- Operating temperatures.

For assistance with radius belt selection, contact Intralox Customer Service or Sales Engineering departments. The Engineering Program should be run to insure that the belt is strong enough for the radius application in question. Contact Customer Service for a copy of the latest version of the Engineering Program.

INTRAFLEX 2200 DESIGN GUIDE SUMMARY

For more information, see the ***Intraflex 2200 Radius Design Guideline manual*** available from Intralox.

A - The minimum turning radius for **Series 2200** is 2.2 times the belt width, measured from the inside edge.

B - The minimum straight run required between turns of opposing direction is 2.0 times the belt width. Shorter straight sections will lead to high wear on the edge guide rail and high pull stresses in the belt.

C - There is no minimum straight run required between turns that are in the same direction.

D - The minimum length for the final straight run (leading into the drive shaft) is 1.5 times the belt width (1500 mm recommended). Shorter lengths may lead to sprocket wear or tracking problems. For narrow belts, a weighted take-up may be required since proper catenary cannot be achieved. See page 3-9 for more information.

E - The minimum length of the first straight run (immediately after the idle shaft) is 1.5 times the belt width. When shorter lengths are required (down to 1.0 times the width), an idle roller may be used in place of sprockets.

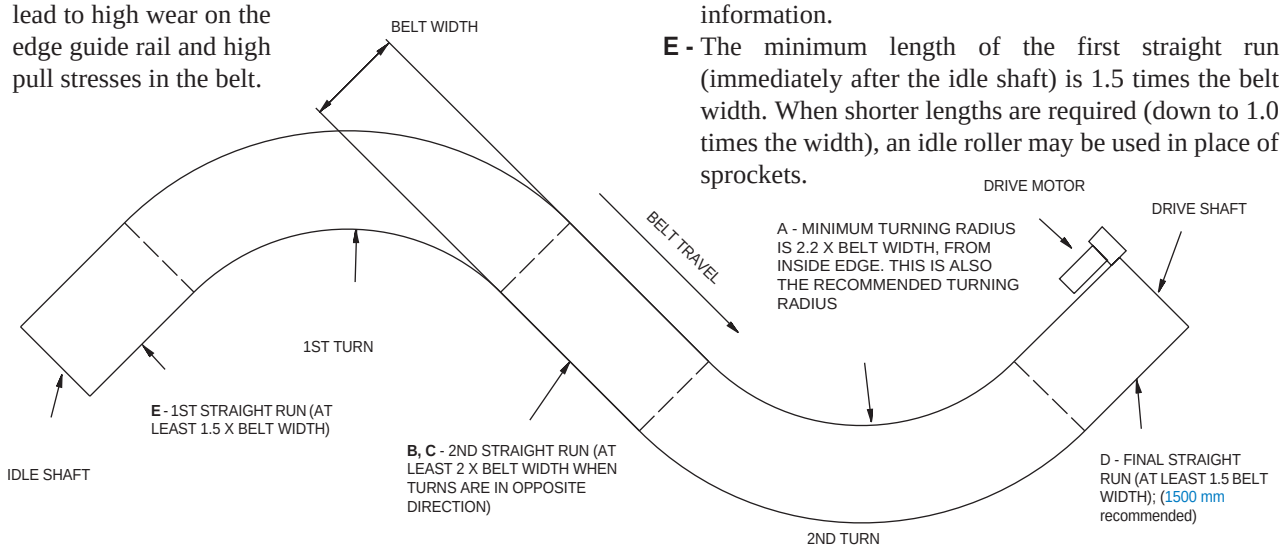
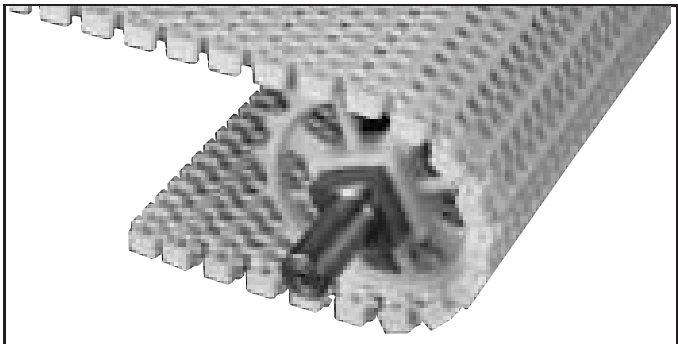
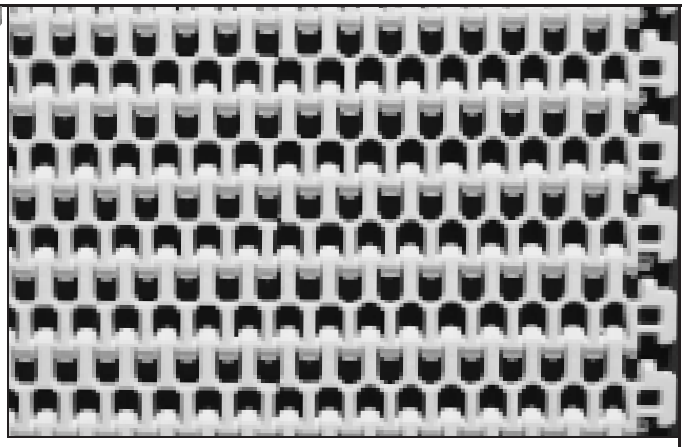


FIG. 2-5 TYPICAL 2-TURN RADIUS LAYOUT

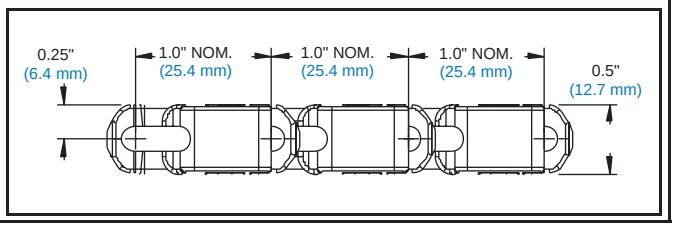




2.2 RADIUS FLUSH GRID

42% Open Area • 23% Product Contact Area

- Opening size (approximate): 0.35 in. (8.9 mm) x 0.30 in. (7.6 mm).
- Hinge-driven, nominal 1 in. (25.4 mm) pitch.
- Designed for radius applications with a minimum turning radius of 2.2 times belt width (measured from inside edge).
- Custom-built in widths from 4" (101.6 mm) and up, in approximately 0.5 in. (12.7 mm) increments.
  Hold Down indent (horizontal) is 1.07 in. (27.2 mm)
- Tab indent (vertical) is 0.35 in. (8.9 mm)



Belt Data

Belt Material	Standard Rod Material ∅ 0.18 in (4.6 mm)	BS Straight Belt Strength lb/ft (kg/m)	Curved* Belt Strength lb (kg) Belt Widths 12 in. (305 mm)	18 in. (457 mm)	24 in. (610 mm)	Temperature Range (continuous) °F (°C) White	W Belt Weight lb/sq ft (kg/sq m) White	Agency Acceptability FDA (USA)
Polypropylene**	Acetal	1200 (1785)	175 (80)	200 (91)	225 (102)	34 (1) to 200 (93)***	1.21 (5.92)	•
Acetal	Nylon	1700 (2528)	250 (114)	280 (127)	300 (136)	-50 (-46) to 200 (93)	1.63 (7.97)	•
Polypropylene	Polypropylene	1000 (1487)	114 (52)	130 (59)	146 (67)	34 (1) to 220 (104)	1.14 (5.57)	•

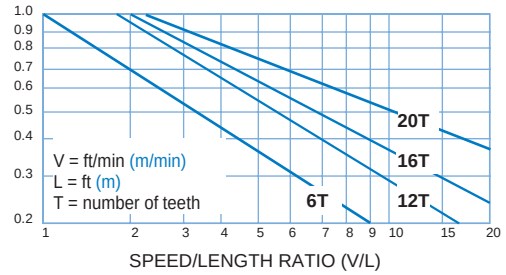
* The Curved Belt Strength is different for each belt width. Contact Intralox Sales Engineering for assistance with analysis.
** Do not use PP in high impact conditions below 7°C.
*** Sideflexing applications should not exceed 180 °F (82 °C).
**** Polypropylene rods can be installed in polypropylene belts when extra chemical resistance is required. Please note lower belt strength.

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)	STEEL (CS & SS) WET (DRY)	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Polypropylene (S)	0.11 (0.13)	0.09 (0.11)	0.24 (0.25)	0.26 (0.26)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polypropylene (A)	NR	NR	0.29 (0.30)	0.31 (0.31)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)
Polyethylene*(S)	0.24 (0.32)	NR	0.14 (0.13)	0.14 (0.15)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)	0.18 (0.19)	0.18 (0.19)	0.26 (0.32)	0.11 (0.17)	— (0.21)	0.40 (0.40)

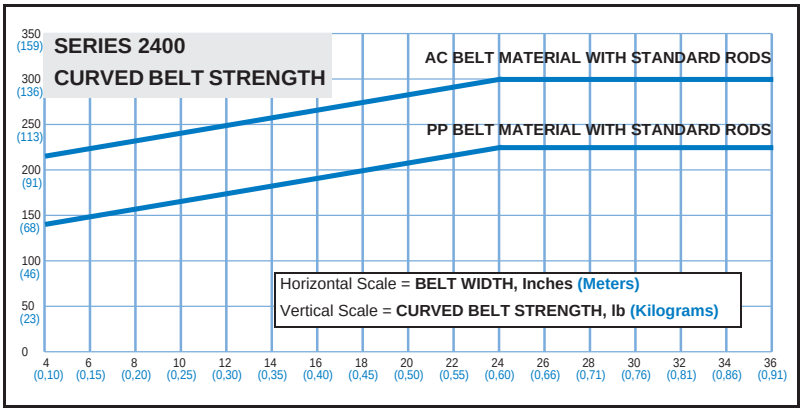
(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR = not recommended.

* Polyethylene is not recommended for container handling

S Strength Factor



Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line.



Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 2400** is on pages 2-86 to 2-87. Series 2400 sprocket placement information is on page 3-6.
- The Intralox Engineering Program will help predict the strength requirements of most radius applications, insuring that the belt is strong enough for the application.
- Belt openings pass straight through belt, making it easy to clean.
- Sprocket drive system is designed to minimise wear and requires very low return side tension.
- Radius belt wearstrips are available.

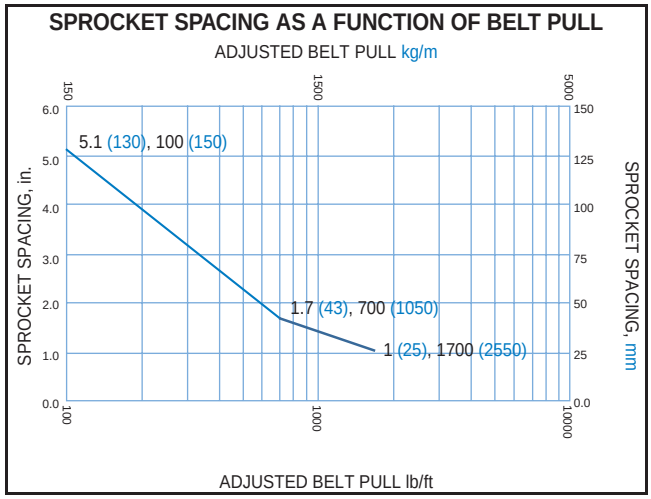
Intralox has sprockets for Series 2400 with 6, 12, 16 and 20 teeth. Intralox can machine plastic sprockets with different numbers of teeth if the application cannot use the standard sizes. Series 2400 sprockets are bi-directional. They cannot be placed incorrectly on the shaft. The standard sprocket dimensions are listed in Table A.

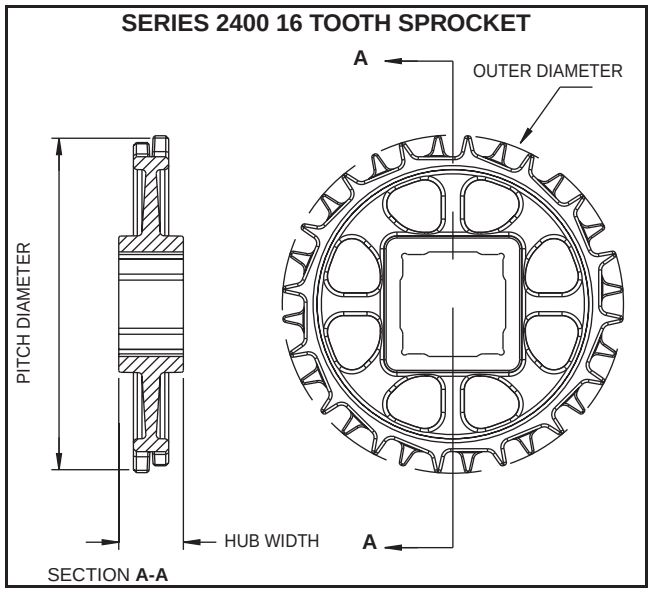
The SPROCKET AND SUPPORT QUANTITY REFERENCE table can be used to determine the minimum number of sprockets required for a particular belt width. The chart SPROCKET SPACING AS A FUNCTION OF BELT PULL shows the recommended drive sprocket spacing for higher loads. More sprockets will be required on the drive shaft to support the belt under higher loads.

SPROCKET AND SUPPORT QUANTITY REFERENCE

Belt Widt Range in. (mm)	*Minimum Number of Sprockets Per Shaft	**Wearstrips Carryway	**Wearstrips Returnway
4 (102)	2	2	2
5 (127)	2	2	2
6 (152)	2	2	2
7 (178)	2	2	2
8 (203)	2	2	2
10 (254)	2	3	2
12 (305)	3	3	2
14 (356)	3	3	3
15 (381)	5	3	3
16 (406)	5	3	3
18 (457)	5	3	3
20 (508)	5	4	3
24 (610)	5	4	3
30 (762)	7	5	4
32 (813)	7	5	4
36 (914)	7	5	4
42 (1067)	9	6	5
48 (1219)	11	7	5
For Other Widths, Use Odd Number of Sprockets at Maximum 6 in. (152 mm) ℄ Spacing		Maximum 6 in. (152 mm) ℄ Spacing	Maximum 12 in. (305 mm) ℄ Spacing

*NOTE: These are the minimum number of sprockets. Additional sprockets may be required for heavily loaded applications.
** The number of wearstrips given does not include the hold down wearstrip.





A — MOULDED SPROCKET DATA

No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes U.S. Sizes Round in.	Available Bore Sizes U.S. Sizes Square in.	Available Bore Sizes Metric Sizes Round (mm)	Available Bore Sizes Metric Sizes Square (mm)
6* (13.40%)	2.0 (51)	2.0 (51)	1.0 (25)	0.75		(20)	
12 (3.41%)	3.9 (99)	4.0 (102)	1.0 (25)		1.5		(40)
16 (1.92%)	5.1 (130)	5.2 (132)	1.0 (25)		1.5		(40)
20 (1.23%)	6.4 (163)	6.4 (163)	1.0 (25)		1.5		(40)
Call Customer Service for lead-times.							

* The 2.0 in. (51 mm) Pitch Diameter 6 tooth sprocket has a recommended belt pull of 60 pounds (89 kg/m)/sprocket.

BELT ACCESSORIES

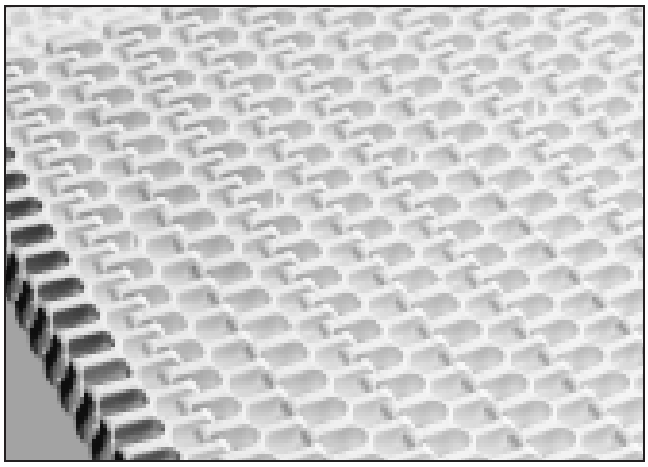
FRICTION MODULES — Friction top modules made from bonding rubber to the surface of a polypropylene base module are available for **Series 2400**. Friction top modules are available with white rubber on white polypropylene base modules or grey rubber on grey polypropylene base modules. White rubber is FDA compliant and has a Shore A durometer of 45. Grey rubber has a Shore A durometer of 56. The lower durometer material provides more friction but will not be as resistant to wear.

There are no placement restrictions, providing the possibility of having an entire friction top belt or a belt with friction top modules spaced throughout. The minimum indent is 1.125 in. (29 mm). The height of the rubber above the surface of the base module is 0.2 in. (5 mm). Friction modules are available on either standard belts or belts with bottom hold down guides.

NOTES ABOUT SERIES 2400 BELTS WITH FRICTION MODULES:

- Minimum indent for polypropylene belts is 1 1/8 in. (29 mm).
- Minimum belt width for acetal belts (with polypropylene-based, friction top modules) is 6 in. (152 mm). The minimum indent for acetal belts (with polypropylene-based friction modules) required to maintain turning belt strength is:
  2 1/8 in. (54 mm) for belts under 12 in. (305 mm) wide.
  3 3/8 in. (86 mm) for belts 12 in. (305 mm) to 20 in. (508 mm) wide.
  4 1/8 in. (105 mm) for belts over 20 in. (508 mm) wide.
- White friction top modules comply with FDA regulations for use in food processing and packaging applications.
- Returnway rollers must have at least a 2 in. (51 mm) radius.
- The returnway must be designed to eliminate rubbing contact with the friction modules.

HOLD DOWN GUIDES — The Hold Down Guide for the **Series 2400** is on the bottom of the belt for use when the belt edges need to be clear. The Hold Down Guide steers the belts through the turns and holds it in place vertically. Having Hold Down Guides on the bottom of the belts provides the ability to run two belts next to each other without a large gap in between.



SERIES 2400 RADIUS BELT WITH FRICTION INSERTS

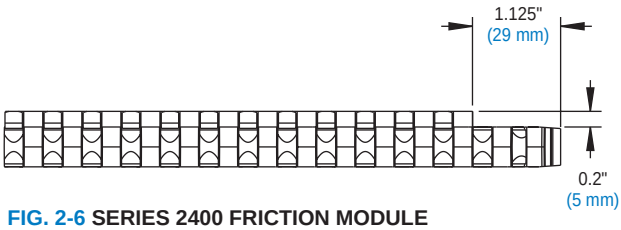
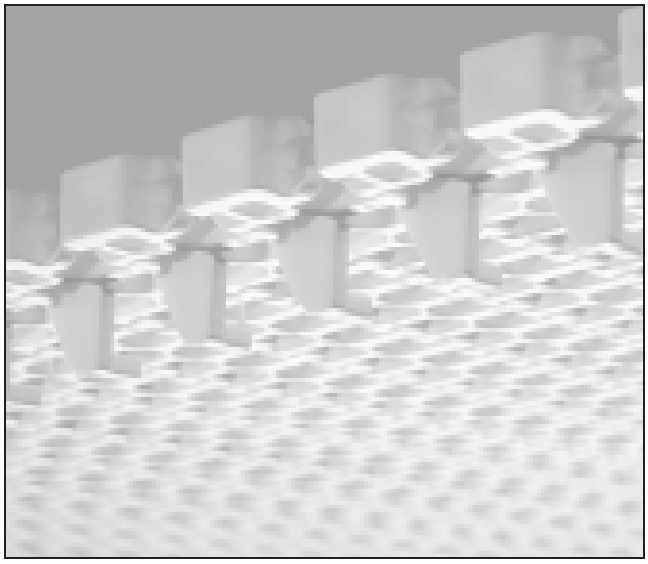


FIG. 2-6 SERIES 2400 FRICTION MODULE



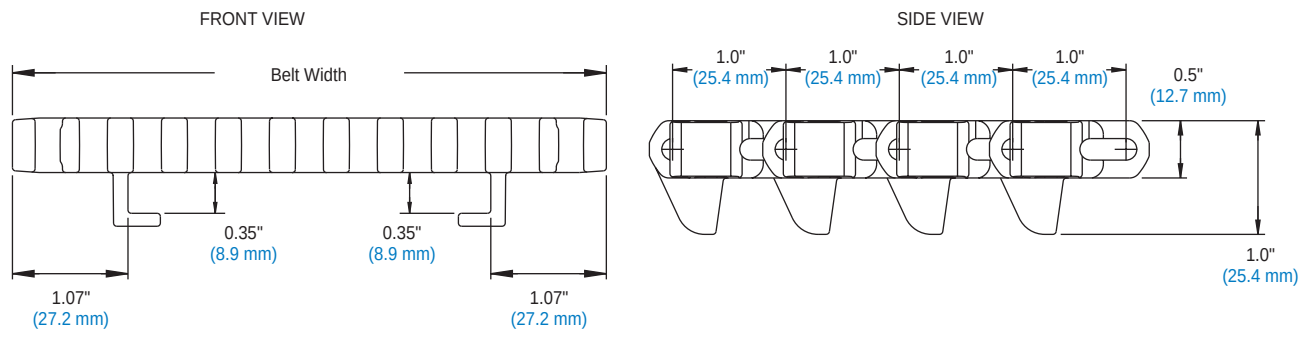


FIG. 2-7 SERIES 2400 HOLD DOWN GUIDES

2400

HOLD DOWN RAILS AND WEARSTRIPS

Intralox recommends using continuous hold down rails through an entire turn, starting at a distance of 1X the belt width before the turn and ending 1X the belt width after the turn. This applies to both carryway and returnway. The use of hold down rails along both side of the belt over the full carryway is recommended but not mandatory.

Series 2400 is available with and without a hold down guide. A wearstrip style is available for each style. The hold down guide design allows the belt to be held down without the wearstrip interfering with the carryway surface. See page 2-98 for more wearstrip information.

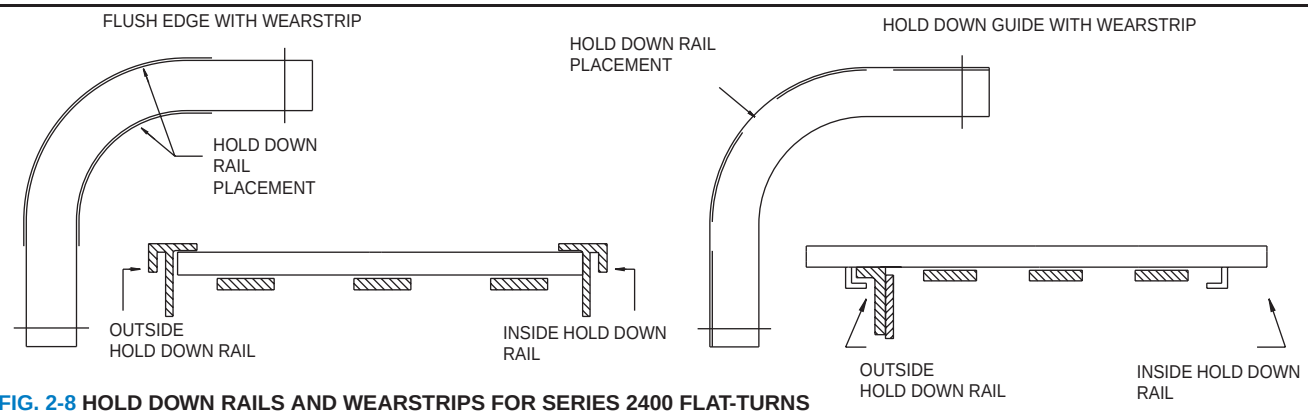


FIG. 2-8 HOLD DOWN RAILS AND WEARSTRIPS FOR SERIES 2400 FLAT-TURNS

BELT SELECTION INSTRUCTIONS

ENGINEERING PROGRAM ANALYSIS FOR SERIES 2400

Intralox's Engineering Program (Version 7.4 and later) can calculate the estimated belt pull for radius applications using **Series 2400**. To run the program, the following information is required (refer to page 4-23 for the Radius Belt Data Sheet):

- Any environmental conditions which may affect the friction coefficient (for dirty or abrasive conditions, use higher friction coefficients than normal).
- Belt width
- Length of each straight run
- Turning angle of each turn
- Turn direction of each turn
- Inside turning radius of each turn
- Carryway/hold down rail material
- Product loading (lb/ft²)
- Product back-up conditions
- Belt speed
- Elevation changes on each section
- Operating temperatures

For assistance with radius belt selection, contact Intralox Customer Service or Sales Engineering departments. The Engineering Program should be run to insure that the belt is strong enough for the radius application in question. Contact Customer Service for a copy of the latest version of the Engineering Program.

INTRAFLEX 2400 DESIGN GUIDE SUMMARY

For more information, see the ***Radius Belt Design Guidelines and Installation Instructions for Series 2200 and 2400,*** available from Intralox.

A - The minimum turning radius for **Series 2400** is 2.2 times the belt width, measured from the inside edge.

B - The minimum straight run required between turns of opposing direction is 2.0 times the belt width. Shorter straight sections will lead to high wear on the edge guide rail and high pull stresses in the belt.

C - There is no minimum straight run required between turns that are in the same direction.

D - The minimum length for the final straight run (leading into the drive shaft) is 1.5 times the belt width (1500 mm recommended). Shorter lengths may lead to sprocket wear or tracking problems. For narrow belts, a weighted take-up may be required since proper catenary cannot be achieved. See page 3-9 for more information.

E - The minimum length of the first straight run (immediately after the idle shaft) is 1.5 times the belt width. When shorter lengths are required (down to 1.0 times the width), an idle roller may be used in place of sprockets.

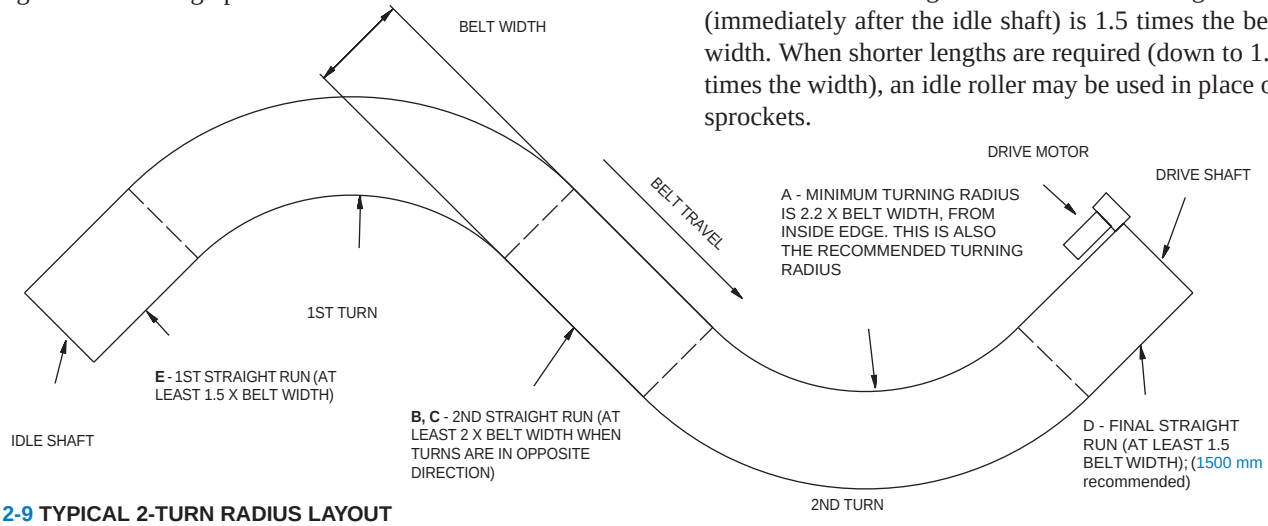
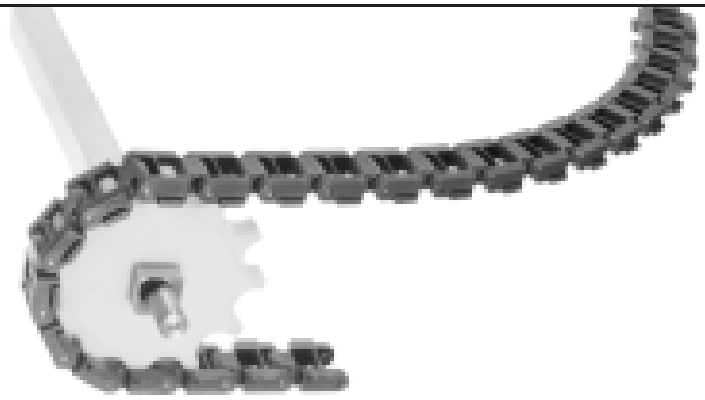
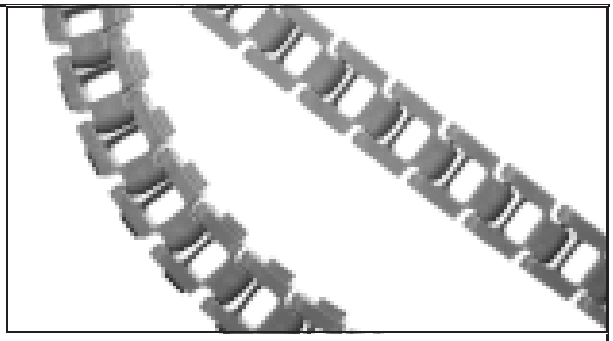
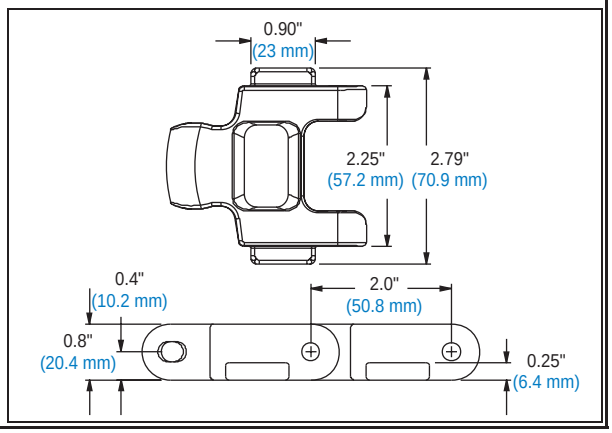


FIG. 2-9 TYPICAL 2-TURN RADIUS LAYOUT







KNUCKLE CHAIN

USDA accepted (Meat and Poultry)

- Centre-driven, nominal 2.0 in. (50.8 mm) pitch.
- The **Series 3000 Knuckle Chain** offers a thick, durable plastic surface around stainless steel pins for long life and less breakage.
- Available in both straight and turning versions.
- Turning version designed for applications with a minimum centerline turning radius of 16 in. (406 mm).
- Both versions are available with extended pins.
- Available in 10 ft. (3.05 m) boxed lengths.

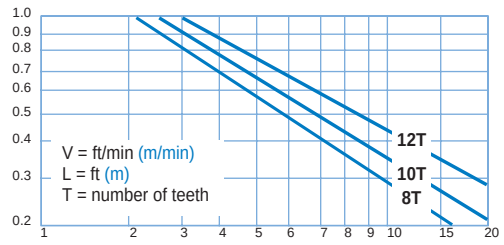
Belt Data

Belt Material	Standard Rod Material ∅ 0.25 in. (6.4 mm)	BS Belt Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Belt Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)	USDA-Meat and Poultry	
Acetal (Straight)	303 SS	700 (317)	-50 (-46) to 200 (93)	0.88 (1.21)	•	•	
Acetal (Turning)	303 SS	560 (254)	-50 (-46) to 200 (93)	0.90 (1.25)	•	•	

Friction Factors	F_w Friction between wearstrip and belt Wearstrip material				F_p Friction between product and belt Product material (used in backup conditions)				
Belt Material	UHMW WET (DRY)	HDPE WET (DRY)	NYLATRON WET (DRY)				PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Acetal (S)	0.10 (0.10)	0.09 (0.08)	0.13 (0.15)				0.13 (0.16)	— (0.18)	

(S) = smooth, clean conditions. (A) = abrasive, dirty conditions. NR= not recommended

S Strength Factor



SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6. Sprocket and accessory information for **Series 3000** is on page 2-90.
- Installation Instructions and Design Guidelines are available. Contact Customer Service for more information.
- **Series 3000 Knuckle Chain** is capable of running on the same tracks as other common chains.

WARNING: Only the Series 3000T (turning version) Knuckle Chain can be used for turning applications. The Series 3000S (straight version) Knuckle Chain cannot be used for turning applications. Hold down edge guides are mandatory on the inside and outside edges of all turns, on both the carrying and return sides of the belt. Unless they interfere with the operation of the carrying equipment, the hold down edge guides should be used throughout the conveyor to protect both the belt and personnel adjacent to the conveyor. Prior to installing, aligning or performing maintenance on any conveyor belt, sprocket or system, consult the federal, state and local regulations in your area regarding the control of hazardous/ stored energy (lockout/tagout).

Intralox has machined, UHMW polyethylene sprockets for **Series 3000** with 8, 10 and 12 teeth. Intralox can machine sprockets with different numbers of teeth if the application cannot use the standard sizes. The standard sprocket dimensions are listed in Table A. Shaft information is listed in Table B.

A — SPROCKET DATA

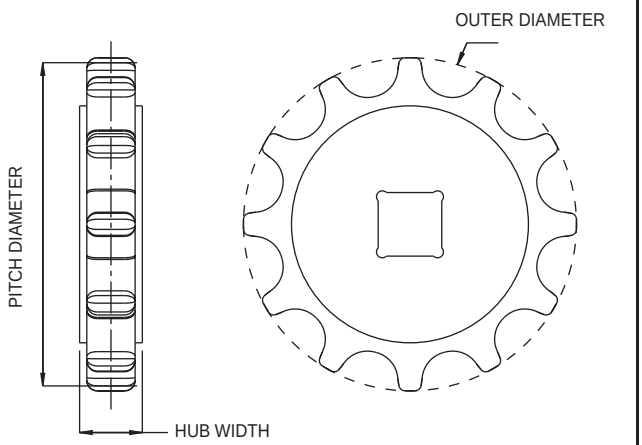
No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes: U.S. Sizes Round* in.	U.S. Sizes Square in.	Metric Sizes Square (mm)	
MACHINED SPROCKETS							
8 (7.61%)	5.2 (132)	5.3 (135)	Square bore 1.5 (38) / Round bore 1.2 (30)	1.25	1.5	(40)	
10 (4.89%)	6.5 (165)	6.7 (170)	1.25 (32)	1.25	1.5	(40)	
12 (3.41%)	7.7 (196)	8.0 (203)	1.25 (32)	1.25	1.5	(40)	

*See product Notes for additional sprocket size information.

Sprocket Pitch Diameter in. (mm)	Chain Pull Limit with UHMW Polyethylene Sprockets, Based on Bore Size - lb (kg)				
	1.5 in. square	**40 mm square**	1 in. round	**1.25 in. round**	1.5 in. round
5.2 (132)	640 (290)	640 (290)	74 (34)	90 (41)	162 (74)
6.5 (165)	520 (236)	520 (236)	78 (35)	95 (43)	172 (78)
7.7 (196)	432 (196)	432 (196)	65 (29)	79 (36)	143 (65)

Bold entries indicate standard sizes

SERIES 3000 MOULDED 12 TOOTH SPROCKET



B — SHAFT DATA

SIZE	Q SHAFT WEIGHT, lb/ft (kg/m) ALUMINIUM	CARBON STEEL	STAINLESS STEEL	I MOMENT OF INERTIA in.^{4} (mm^4)
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (11.38)	0.42 (175,600)
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

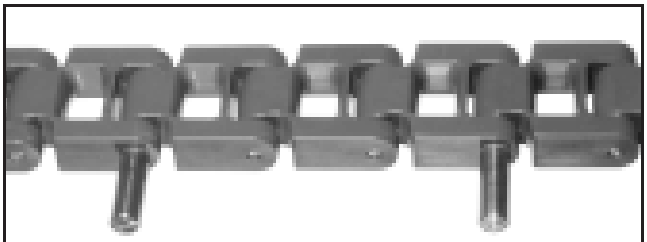
* Intralox USA offers square shafting in these materials and sizes.
** Intralox Europe offers square shafting in these materials and sizes.

BELT ACCESSORIES

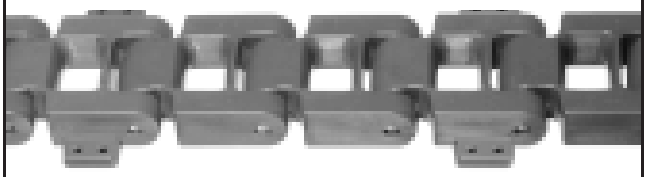
EXTENDED PINS — Modules with 303 stainless steel extended pins can be spliced into both the basic turning and straight running chains. These pins are commonly used in side by side chain strands where rollers are used for low back pressure applications. The minimum extended pin spacing is 2.0 in. (50.8 mm). The extended pin modules can be spliced into the standard chain every 2.0 in. (50.8 mm).

EXTENDED TABS — Modules with extended tabs can be spliced into both the basic turning and straight running chains. These extended tabs can be used to attach flights, cleats, etc. The extended tab modules are based on the turning chain design, so the rating for the turning chain should be used even if the extended tab modules are spliced into straight running chain. The minimum tab spacing is 2.0 in. (50.8 mm). The tabs can be spliced into the standard chain every 2.0 in. (50.8 mm).

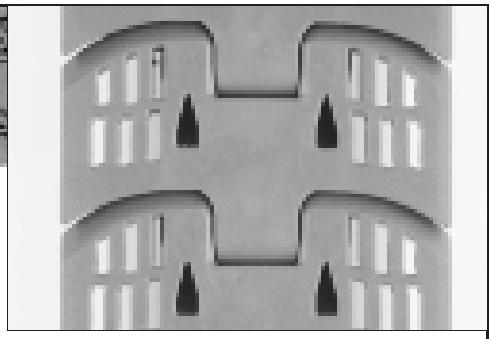
Intralox offers only extended tabs and extended pins. Attachments for either of these accessories are not available through Intralox. Contact Customer Service for lead-times.

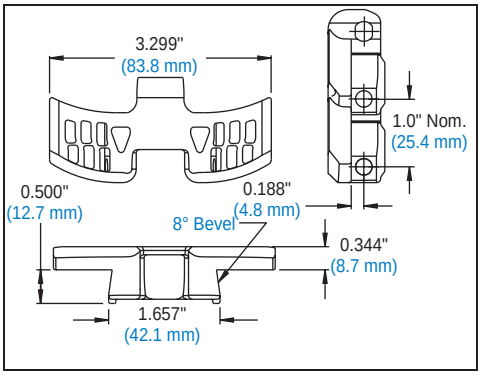


Extended pins for straight or turning versions



Extended tabs for straight or turning versions





S4009 FLUSH GRID, 13% Open Area

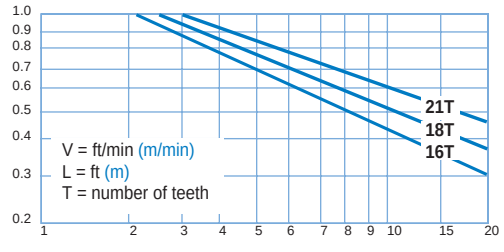
- Nominal 1.0 in. (25.4 mm) pitch, hinge-driven.
- Designed for applications with a minimum centerline turning radius of 18 in. (457 mm).
- Same deck thickness as the straight running belt counterpart S900 FG (0.344 in. [8.7 mm]).

Belt Data

Belt Material	Chain Width in. (mm)	Standard Pin Material ∅ 0.25 in. (6.4 mm)	BS Chain Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Chain Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)
Acetal (S)	3.299 (83.8)	303 SS	500 (227)	-50 (-46) to 200 (93)	1.29 (1.92)	•

Friction Factors	F_w Friction between wearstrip and chain	F_p Friction between product and chain Product material (used in backup conditions)				
Belt Material	Wearstrip material - UHMW	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Acetal (S)	0.10 (0.10)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
(S) = Smooth, clean conditions						

S Strength Factor

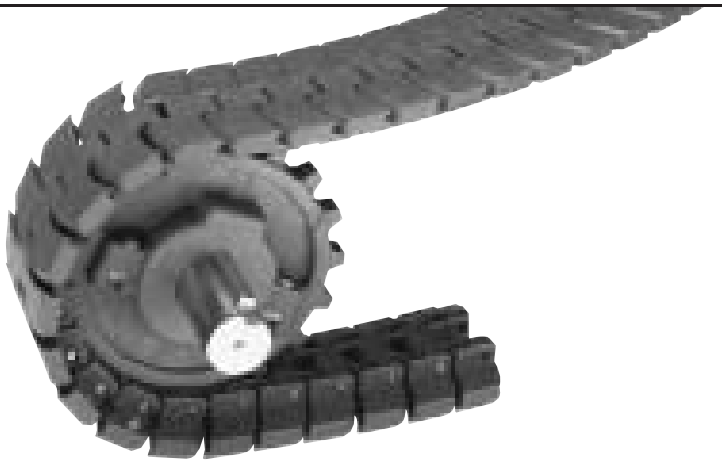


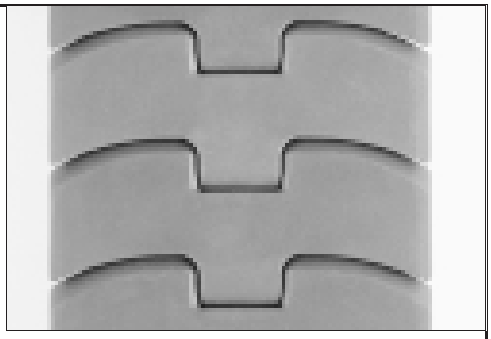
SPEED/LENGTH RATIO (V/L)

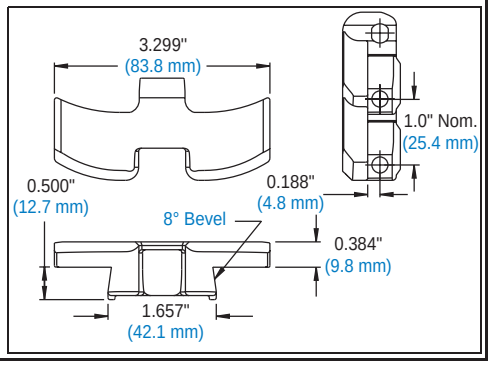
Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6.
- S4000 Sideflexing Chains use S1400 sprockets. Sprocket information for Series 1400/4000 is on page 2-94.
- All Series 1400/4000 sprockets use the split design so shafts do not have to be removed for retrofits and changeovers.
- Available in 10 ft. (3.05 m) boxed lengths.
- *Series 4000 Sideflexing Chain Design Guidelines and Installation Instructions* is available. Contact Intralox Customer Service for more information.
- Corner Tracks, with bevel design, are mandatory on the inside edges of all turns.
- Intralox's Engineering Program for S4000 Sideflexing Chains can calculate the estimated chain pull for your system. Contact Intralox Sales Engineering for assistance.







S4009 FLAT TOP, 0% Open Area

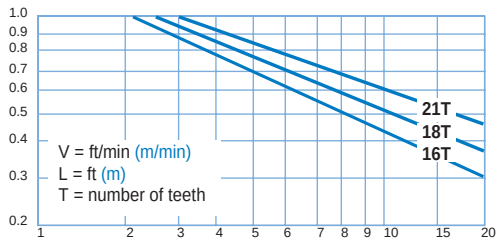
- Nominal 1.0 in. (25.4 mm) pitch, hinge-driven.
- Designed for applications with a minimum centerline turning radius of 18 in. (457 mm).
- Same deck thickness as the straight running belt counterpart S900 FT (0.384 in. [9.8 mm]).

Belt Data

Belt Material	Chain Width in. (mm)	Standard Pin Material ∅ 0.25 in. (6.4 mm)	BS Chain Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Chain Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)
Acetal (S)	3.299 (83.8)	303 SS	500 (227)	-50 (-46) to 200 (93)	1.11 (1.65)	•

Friction Factors	Fw Friction between wearstrip and chain	Fp Friction between product and chain Product material (used in backup conditions)				
Belt Material	Wearstrip material - UHMW	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Acetal (S)	0.10 (0.10)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
(S) = Smooth, clean conditions						

S Strength Factor

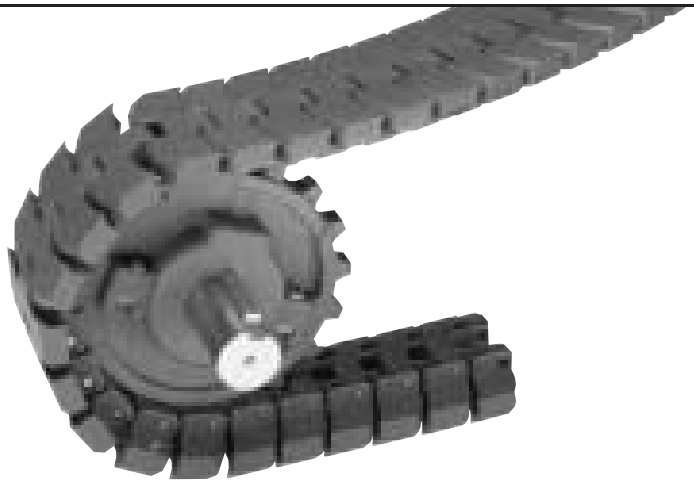


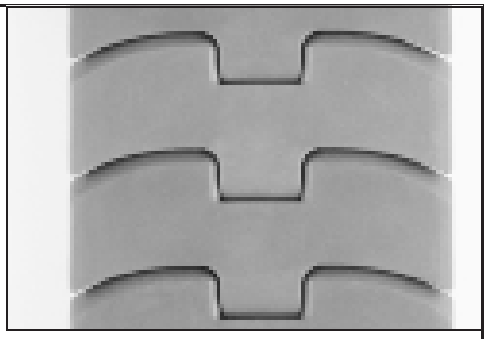
SPEED/LENGTH RATIO (V/L)

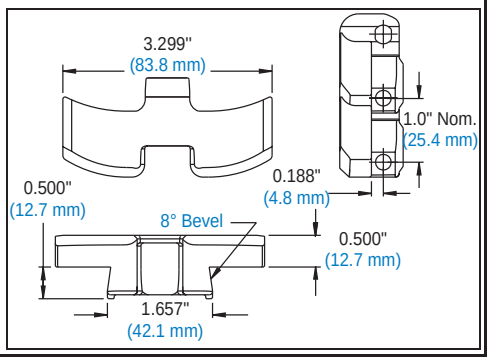
Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6.
- S4000 Sideflexing Chains use S1400 sprockets. Sprocket information for Series 1400/4000 is on page 2-94.
- All Series 1400/4000 sprockets use the split design so shafts do not have to be removed for retrofits and changeovers.
- Available in 10 ft. (3.05 m) boxed lengths.
- *Series 4000 Sideflexing Chain Design Guidelines and Installation Instructions* is available. Contact Intralox Customer Service for more information.
- Corner Tracks, with bevel design, are mandatory on the inside edges of all turns.
- Intralox's Engineering Program for S4000 Sideflexing Chains can calculate the estimated chain pull for your system. Contact Intralox Sales Engineering for assistance.







S4014 FLAT TOP, 0% Open Area

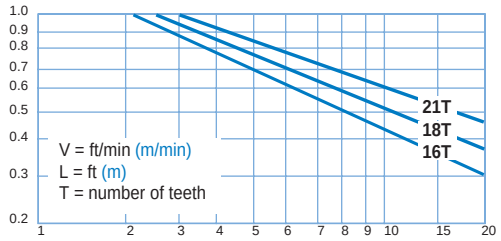
- Nominal 1.0 in. (25.4 mm) pitch, hinge-driven.
- Designed for applications with a minimum centerline turning radius of 18 in. (457 mm).
- Same deck thickness as the straight running belt counterpart S1400 FT (0.5 in. [12.7 mm]).

Belt Data

Belt Material	Chain Width in. (mm)	Standard Pin Material ∅ 0.25 in. (6.4 mm)	BS Chain Strength lb (kg)	Temperature Range (continuous) °F (°C)	W Chain Weight lb/ft (kg/m)	Agency Acceptability FDA (USA)
Acetal (S)	3.299 (83.8)	303 SS	500 (227)	-50 (-46) to 200 (93)	0.97 (1.44)	•

Friction Factors	F_w Friction between wearstrip and chain	F_p Friction between product and chain Product material (used in backup conditions)				
Belt Material	Wearstrip material - UHMW	GLASS WET (DRY)	STEEL WET (DRY)	PLASTIC WET (DRY)	CARDBOARD WET (DRY)	ALUMINIUM WET (DRY)
Acetal (S)	0.10 (0.10)	0.13 (0.14)	0.13 (0.13)	0.13 (0.16)	— (0.18)	0.33 (0.27)
(S) = Smooth, clean conditions						

S Strength Factor



SPEED/LENGTH RATIO (V/L)

Divide belt speed "V" by the shaft ℄ distance "L". Strength Factor is found at intersection of speed/length ratio and appropriate sprocket line. See page 2-7 for more information.

Product Notes

- Belt selection on pages 1-5 to 1-10 and material information on pages 2-2 to 2-6.
- S4000 Sideflexing Chains use S1400 sprockets. Sprocket information for **Series 1400/4000** is on page 2-94.
- All Series **1400/4000** sprockets use the split design so shafts do not have to be removed for retrofits and changeovers.
- Available in 10 ft. (3.05 m) boxed lengths.
- *Series 4000 Sideflexing Chain Design Guidelines and Installation Instructions* is available. Contact Intralox Customer Service for more information.
- Corner Tracks, with bevel design, are mandatory on the inside edges of all turns.
- Intralox's Engineering Program for S4000 Sideflexing Chains can calculate the estimated chain pull for your system. Contact Intralox Sales Engineering for assistance.

Intralox makes available split sprockets for Series 4000 with 16, 18 and 21 teeth.* **S4000 Sideflexing Chains utilize S1400 sprockets.** The standard dimensions are listed in Table A.

A — SPROCKET DATA

No. of Teeth (Chordal Action)	Nom. Pitch Dia. in. (mm)	Nom. Outer Dia. in. (mm)	Nom. Hub Width in. (mm)	Available Bore Sizes			
				U.S. Sizes		Metric Sizes	
				Round in.	Square in.	Round (mm)	Square (mm)
MOULDED SPROCKETS							
16 (1.88%)	5.1 (130)	5.2 (132)	1.96 (50)	1" to 2" in 1/16" increments	1.5	25 mm to 50 mm in 5 mm increments	(40)
					—		(—)
18 (1.52%)	5.7 (145)	5.8 (148)	1.96 (50)	1" to 2" in 1/16" increments	1.5	25 mm to 50 mm in 5 mm increments	(40)
					2.5		(60)
21 (1.12%)	6.7 (170)	6.8 (172)	1.96 (50)	1" to 2" in 1/16" increments	1.5	25 mm to 50 mm in 5 mm increments	(40)
					2.5		(60)

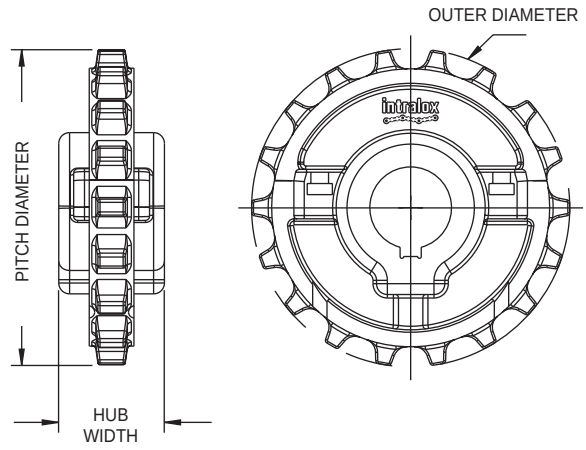
Call Customer Service for lead-times.

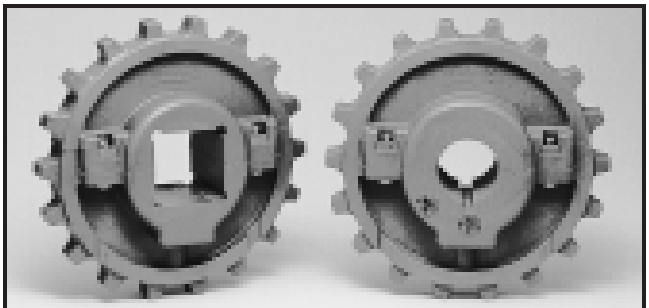
B — SHAFT DATA

SIZE	Q SHAFT WEIGHT, lb/ft (kg/m)			I MOMENT OF INERTIA in.^{4} (mm^4)
	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	
1.5 IN. SQUARE	2.64* (3.93)	7.65* (11.38)	7.65* (11.38)	0.42 (175,600)
2.5 IN. SQUARE	7.34* (10.92)	21.25* (31.62)	21.25* (31.62)	3.25 (1,355,000)
40 mm SQUARE	(4.34) 2.92	(12.55)** 8.43	(12.55)** 8.43	(213,300) 0.51
60 mm SQUARE	(10.05) 6.75	(29.11)** 19.56	(29.11)** 19.56	(1,080,000) 2.78
E MODULUS OF ELASTICITY lb/in² (kg/mm²)	10,000,000 (7,000)	30,000,000 (21,100)	28,000,000 (19,700)	

* Intralox USA offers square shafting in these materials and sizes.
** Intralox Europe offers square shafting in these materials and sizes.

SERIES 4000 18 TOOTH SPROCKET





SERIES 4000 GLASS FILLED NYLON SQUARE BORE SPLIT AND ROUND BORE SPLIT SPROCKETS

BELT ACCESSORIES

CORNER TRACKS — Intralox recommends using continuous corner tracks through an entire turn. This applies to both carryway and returnway. The use of extensions are recommended but not mandatory. Corner Tracks are available through Intralox. Dimensional drawings are also available if local fabrication is preferred. Intralox recommends UHMW Corner Tracks, which are suitable for most applications. For extremely abrasive conditions or high chain speeds without lubrication, please consult Intralox Sales Engineering for appropriate Corner Track material. S4000 Chains can run on commonly available, 8° bevelled Corner Tracks.

SQUARE SHAFTS

MACHINED TO CUSTOMER SPECIFICATIONS

After the stock is cut to length, the raw shaft is precision straightened. The bearing journals are turned, followed by the cutting of retainer ring grooves, keyways and chamfers. The final step is a thorough, quality control inspection before shipping.

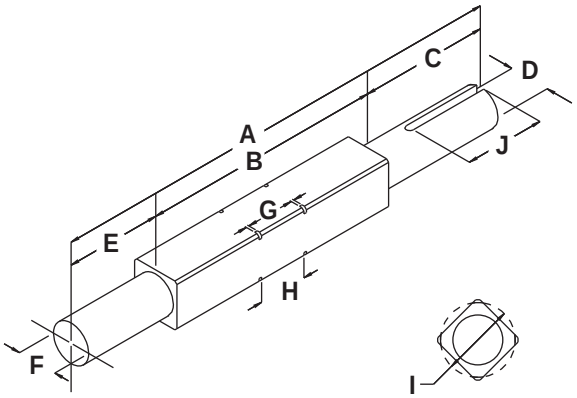


FIG. 2-10 SHAFT DIMENSIONS

DIMENSIONS REQUIRED:

A - LENGTH, overall
B - LENGTH, bearing-end journal
C - LENGTH, square section
D - LENGTH, drive-end journal and keyway dimensions
E - DIAMETER, bearing journal
F - DIAMETER, drive-end journal
G - WIDTH, retainer ring groove
H - WIDTH, sprocket hub
I - DIAMETER, ring groove
J - LENGTH of keyway

SHAFTS AVAILABLE FROM INTRALOX USA**
SHAFT TOLERANCES IN INCHES

Square Size	Aluminium (6061-T6)	Carbon Steel (C-1018)	Stainless Steel (303)	Stainless Steel (316)
5/8 in.	N/A	+0.000 -0.003	+0.000 -0.004	+0.000 -0.004
1 in.	+0.003 -0.003	+0.000 -0.003	+0.000 -0.004	N/A
1.5 in.	+0.003 -0.003	+0.000 -0.003	+0.000 -0.006	+0.000 -0.006
2.5 in.	N/A	+0.000 -0.004	+0.000 -0.008	+0.000 -0.008
3.5 in.*	N/A	+0.000 -0.005	+0.010 -0.020 (304 HR)	N/A

*3.5 in. carbon steel shafts can be nickel plated for corrosion resistance.
**Consult Intralox for shafts longer than 12'.

SHAFTS AVAILABLE FROM INTRALOX EUROPE*
SHAFT TOLERANCES IN MM

Square Size	Carbon Steel (KG-37)	Stainless Steel (304)
25 mm	+0.000 -0.130	+0.000 -0.130
40 mm	+0.000 -0.160	+0.000 -0.160
60 mm	+0.000 -0.180	+0.000 -0.180
65 mm	+0.000 -0.180	+0.000 -0.180
90 mm	+0.000 -0.220	+0.000 -0.220

*Consult Intralox for shafts longer than 3 m.

SHAFT DIMENSIONS AND TOLERANCES

Shaft Size	Retainer Ring Groove and Chamfer Dimensions		
	Groove Diam.	Width	Chamfer*
5/8 in.	0.762 ± 0.003 in.	0.046 + 0.003/- 0.000 in.	0.822 ± 0.010 in.
1 in.	1.219 ± 0.005 in.	0.056 + 0.004/- 0.000 in.	1.314 ± 0.010 in.
1.5 in.	1.913 ± 0.005 in.	0.086 + 0.004/- 0.000 in.	2.022 ± 0.010 in.
2.5 in.	3.287 ± 0.005 in.	0.120 + 0.004/- 0.000 in.	3.436 ± 0.010 in.
3.5 in.	4.702 ± 0.005 in.	0.120 + 0.004/- 0.000 in.	4.850 ± 0.010 in.
25.4 mm	30 ± 0.1 mm	2.0 + 0.15/- 0.00 mm	33 ± 0.25.4 mm
40 mm	51 ± 0.1 mm	2.5 + 0.15/- 0.00 mm	54 ± 0.25.4 mm
60 mm	77.5 ± 0.1 mm	3.5 + 0.15/- 0.00 mm	82 ± 0.25.4 mm
65 mm	85 ± 0.1 mm	3.5 + 0.15/- 0.00 mm	89 ± 0.25.4 mm
90 mm	120 ± 0.1 mm	4.5 + 0.15/- 0.00 mm	124 ± 0.25.4 mm

NOTE: In some instances, the retainer ring grooves will be offset from the shaft centre. See Retaining Sprockets on page 3-4.
*Shaft must be chamfered for sprockets to fit.

TOLERANCES (Unless otherwise specified)

OVERALL LENGTH	< 48 in. ± 0.061 in. (< 1200 ± 0.8 mm) > 48 in. ± 0.125 in. (> 1200 ± 1.2 mm)
JOURNAL DIAM. vb	- 0.0005 in./- 0.003 in. (Øh7 vlgs. NEN-ISO 286-2)
KEYWAY WIDTHS	+ 0.003 in./- 0.000 in. (+ 0.05/- 0.00 mm)

SURFACE FINISHES

JOURNAL	63 microinches (0.063 micrometers)
OTHER MACHINED SURFACES	125 microinches (0.125 micrometers)

Unless otherwise specified — USA keyways are for parallel square keys (ANSI B17.1 - 1967, R1973).

Metric keyways are for flat, inlaid keys with round ends (DIN 6885-A).

RETAINER RINGS

STANDARD RETAINER RINGS

POLYSULFONE plastic retainer rings are available in sizes to fit 1.5 in. and 2.5 in. shafts. These rings require grooves identical to those below for circular rings on 1.5 in. and 2.5 in. shafts. The temperature range of polysulfone is -125 °F (-98 °C) to 300 °F (149 °C). (Not available in metric sizes.)

NOTE: Intralox does not recommend use of the polysulfone retainer ring with the following sprockets: **Series 400** 6 tooth sprockets (1.5 in. or 40 mm bore), **Series 400** 8 tooth sprockets (2.5 in. or 60 mm bore) and **Series 1100** 16 tooth sprockets (2.5 in. or 60 mm bore).

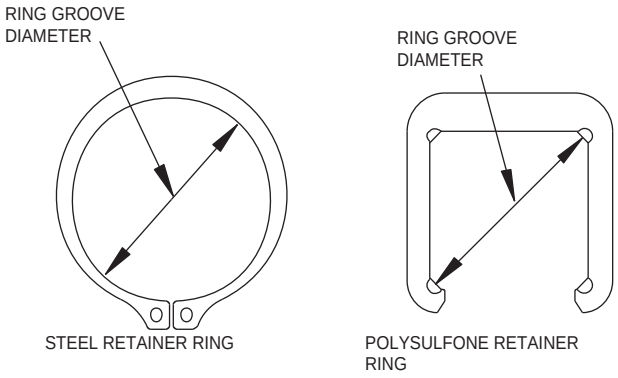


FIG. 2-11 **RETAINER RINGS**

STAINLESS STEEL RETAINING RINGS are also available for retaining sprockets on square shafts. The following ANSI Type 3AMI rings, conforming to MIL SPEC R-2124B, are available. 1.219 in. diameter retainer rings should not be used with **Series 900** 2.1 in. (53 mm) pitch diameter sprockets.*

Shaft Sizes	Groove Width	Groove Diameter
INTRALOX USA		
5/8 in.	0.046 in.	0.822 in.
1 in.	0.046 in.	1.219 in.
1.5 in	0.086 in.	1.913 in.
2.5 in.	0.120 in.	3.287 in.
3.5 in.	0.120 in.	4.702 in.
INTRALOX EUROPE		
(25.4 mm)	(2.0 mm)	(30 mm)
(40 mm)	(2.5 mm)	(52 mm)
(60 mm)	(3.5 mm)	(80 mm)
(65 mm)	(3.5 mm)	(85 mm)
(90 mm)*	(4.5 mm)	(120 mm)

*90 mm retainer rings are galvanized steel only

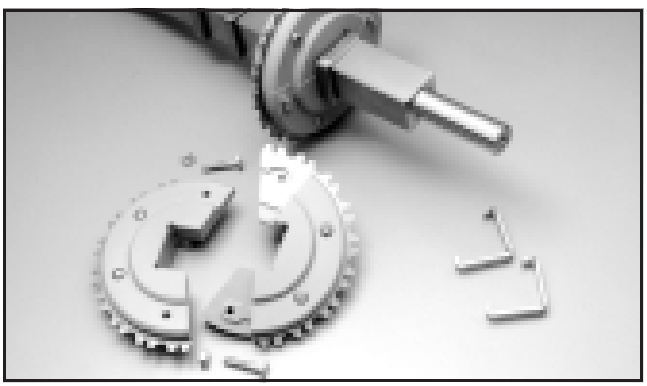
SELF-SET RETAINER RINGS

Self-Set retainer rings eliminate the need for machined grooves on the shaft and can be installed without removing the shaft. These USDA accepted retainer rings can be used with almost all Intralox sprockets.

The Self-Set retainer rings snap into place on the square shaft and are fixed in position with a unique set screw that cannot fall out of the retainer ring during operation, making it totally safe for all food processing applications. The shafts must have chamfered edges for the retainer to work properly.

The retainer rings are made from non corrosive 316 stainless steel, and are available to fit 1.0 in., 1.5 in., 2.5 in., 3.5 in., 40 mm, 60 mm and 65 mm shafts.

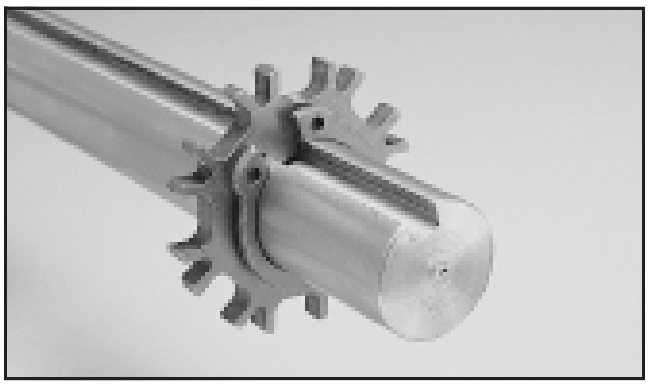
NOTE: Self-Set retainer rings have these restrictions: 1 in. retainer rings cannot be used with the **Series 100** 2.0 in. (51 mm) pitch diameter or **Series 900** 2.1 in. (53 mm) pitch diameter sprockets*; 40 mm retainer rings cannot be used with the **Series 900** 3.1 in. (79 mm) pitch diameter and **Series 1100** 3.1 in. (79 mm) pitch diameter sprockets; and, 65 mm retainer rings cannot be used with the **Series 400** 5.2 in. (132 mm) pitch diameter sprockets.



HEAVY DUTY RETAINER RINGS

To support the 8 and 12 tooth **Series 1100** sprockets, Intralox has retainer rings to fit the small, round shafts used by these sprockets. The retainer rings for the round shafting are heavy duty stainless steel rings and DO NOT REQUIRE A GROOVE FOR PLACEMENT. Heavy duty retainer rings are available for 0.75 in., 1 in., 20 mm and 25.4 mm round shafts.

It is very important that grooves are not used on round shafting, as this will cause fatigue and shaft failure. These heavy duty rings stay in place using friction. No grooves are required.

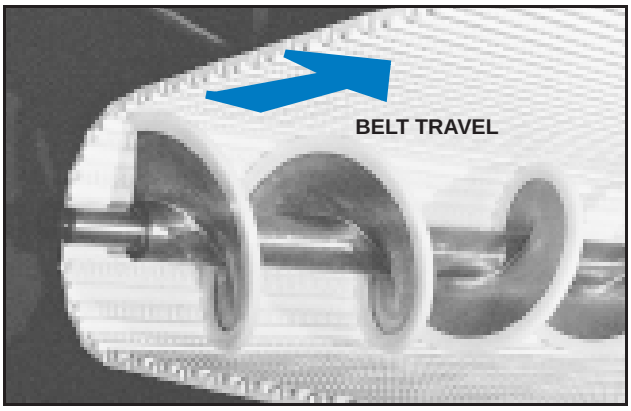


*To lock down the **Series 900** 2.1 in. (53 mm) pitch diameter sprockets, a set screw, placed on each side of the sprocket, is required. Contact Intralox Sales Engineering for more information.

SCROLL IDLERS

Scrolls from Intralox may be used in applications where the idle end shaft and sprockets must be kept clean. The curved, flighted surfaces of the scroll direct debris away from the belt centre toward the edges, where it can fall harmlessly to the floor or receptacle.

Intralox offers scrolls in two nominal diameters: 6 in. (152 mm) and 9 in. (229 mm). Flight pitch, the axial distance for the flight to sweep through a full circle, is also 6 in. (152 mm) and 9 in. (229 mm), respectively. Since the scroll is also supporting the idle end of the belt, each nominal diameter has an associated minimum scroll length to insure proper belt support. For very narrow belts, or for extra support, a double-flighted scroll is available. All scrolls are mounted on a 2.5 in. (63.5 mm) diameter round shaft. Maximum journal diameter is 2.5 in. (63.5 mm) and minimum journal length is 2 in. (50.8 mm).



SCROLL DIMENSIONS, in. (mm)			
Nominal Diameter	Actual Diameter	Min. Single- Flighted Scroll Length*	Min. Double-flighted Scroll Length*
6 (152)	6.7 (170)	12.5 (318)	6.5 (165)
9 (229)	9.7 (246)	18.5 (470)	9.5 (241)

*Exclusive of Journals.

Intralox scrolls are offered in carbon and stainless steel materials. Carbon steel scrolls are treated and painted for protection. All scrolls have a thick section of UHMW wearstrip attached to the flight edges. Stainless steel scrolls with a polished weld bead are available for USDA applications.

SCROLL FEATURES	Flight Material		
	Carbon Steel	Stainless Steel	Stainless Steel USDA
6 in. (152 mm) Scroll Size	•	•	•
9 in. (229 mm) Scroll Size	•	•	•
Intermittent Welds	•	•	
Continuous, Polished Wields			•
UHMW Flight Edging	•	•	•
Primer Gray Paint	•		

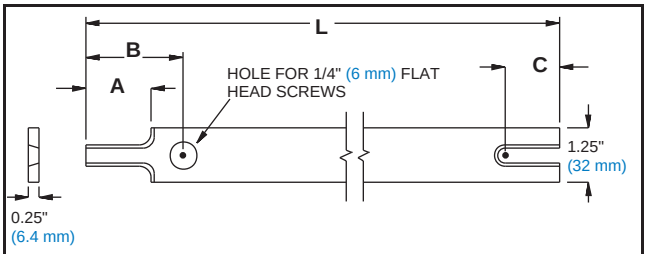
Intralox scrolls have no built-in tracking ability. It may be necessary to use side mounted wearstrips on the idle end.

WEARSTRIPS

FLAT WEARSTRIPS

STANDARD FLAT WEARSTRIPS are available in UHMW (Ultra High Molecular Weight), HDPE (High Density Polyethylene) and Nylatron (a Molybdenum-filled nylon). UHMW and HDPE wearstrips measure 0.25 in. (6 mm) thick x 1.25 in. (32 mm) wide x 120 in. (3 m). Nylatron wearstrips measure 0.125 in. (3 mm) thick x 1.25 in. (32 mm) wide x 48 in. (1.2 m). UHMW and HDPE wearstrips are FDA and USDA compliant for direct food contact. Nylatron wearstrip is not FDA or USDA accepted for food applications.

FLAT FINGER-JOINT WEARSTRIPS have a notched end design which provides overlapping section for continuous support. UHMW wearstrips are available in 24 in. (0.61 m) and 60 in. (1.5 m) lengths. HDPE wearstrip is available in 24 in. (0.61 m) lengths. Fasteners are supplied.



L	A	B	C
24" (0.61 m)	1.125" (28.6 mm)	1.75" (44.5 mm)	0.75" (19.1 mm)
60" (1.52 m)	1.875" (47.6 mm)	2.25" (57.2 mm)	1.50" (38.1 mm)

FIG. 2-12 FLAT FINGER-JOINT WEARSTRIPS

CUSTOM WEARSTRIPS

SERIES 2000 WEARSTRIP

The modified wearstrip (below, left) is used on Intraflex 2000 carryways. The raised ribs extend above the edge of the wearstrip. The standard wearstrip (below, right) is well suited for the returnway side of the conveyor. Both wearstrips are available in UHMW (Ultra High Molecular Weight) polyethylene.

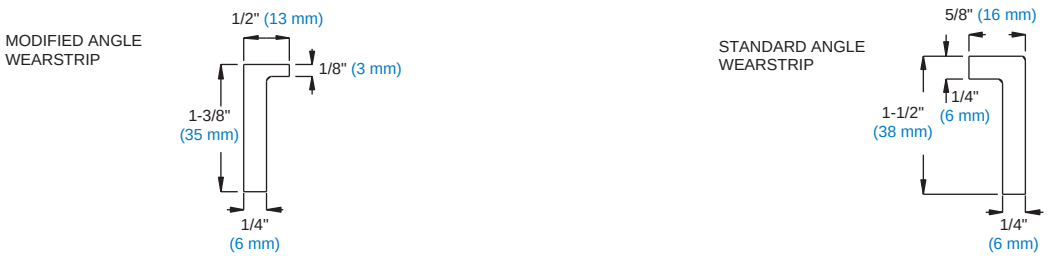
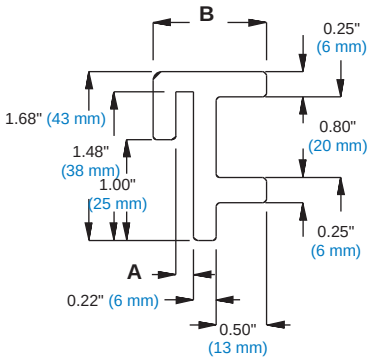


FIG. 2-13A 120" UHMW SERIES 2000 CUSTOM WEARSTRIPS

RADIUS BELT WEARSTRIPS

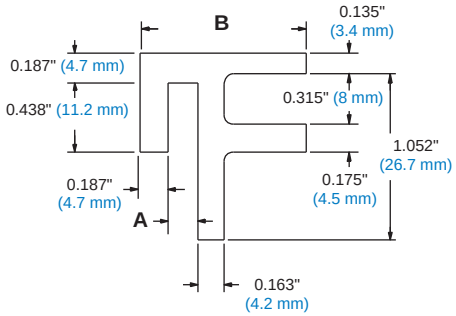
All of the **Radius Belt** wearstrips are available in natural UHMW and self-lubricating, grey TIVAR, oil-filled UHMW.

The Angle and Centre Rail wearstrips utilize the EZ Clean design. All wearstrips are available in either 1/8 in. (3.2 mm) or 3/16 in. (4.7 mm) sizes.

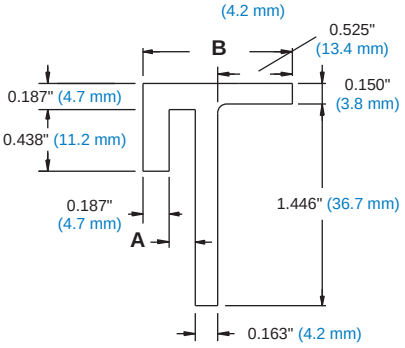


Wearstrip Dimensions		A (Nominal)	
		1/8" (3.2 mm)	3/16" (4.7 mm)
B	Flush Edge	1.06" (27 mm)	1.13" (29 mm)
	Tabbed Edge	1.00" (25.4 mm)	1.06" (27 mm)
	Angle	1.00" (25.4 mm)	1.06" (27 mm)
	Centre Rail	1.56" (38 mm)	1.56" (38 mm)

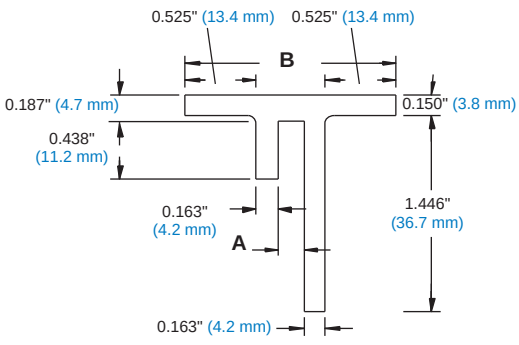
FLUSH EDGE, HOLD DOWN WEARSTRIP



TABBED EDGE, HOLD DOWN WEARSTRIP



EZ CLEAN WEARSTRIP
ANGLE
HOLD DOWN WEARSTRIP



EZ CLEAN WEARSTRIP
CENTER RAIL
HOLD DOWN WEARSTRIP

FIG. 2-13B 120" UHMW RADIUS BELT CUSTOM WEARSTRIPS

PUSHER BARS

Accumulation tables are most often used in the beverage industry, allowing upstream production machinery to operate continuously and economically in the event that some downstream machinery stops the flow of the product. These tables act as a buffer to absorb the product overflow until the downstream problem is rectified. The principal function of a pusher bar is to move the last few rows of product off the accumulation table, past the dead plate area and onto the primary conveyor lines. Pusher bars rest on the accumulation table, which must use a Raised Rib style belt (**Series 100**, **400** and **900**).

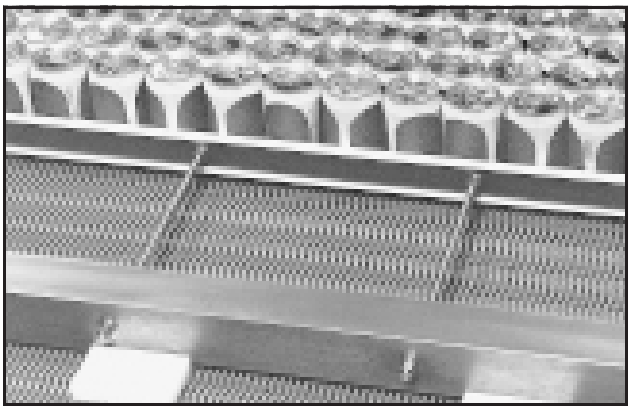


FIG. 2-14 **PUSHER BAR SIDE VIEW**

The bar is a 2.5 in. (63.5 mm) square stainless or carbon steel shaft which rides in a number of slotted UHMW guide shoes. The shoes are slotted on the bottom to mesh with the ribs of the belt and keep the bar aligned, perpendicular to the direction of belt travel. The shoes bear the entire weight of the pusher bar, so it is recommended that wearstrips be placed to support the belt directly under the shoes.

The blade of the pusher bar actually does the pushing. It can be specified in 24 in. (610 mm) to 120 in. (3.05 m) lengths and consists of a rigid steel bar capped with UHMW wearstrip, so as not to mar or damage the product. The blade is set off from the weighted shaft by threaded steel rods, making the amount of offset adjustable to individual needs.

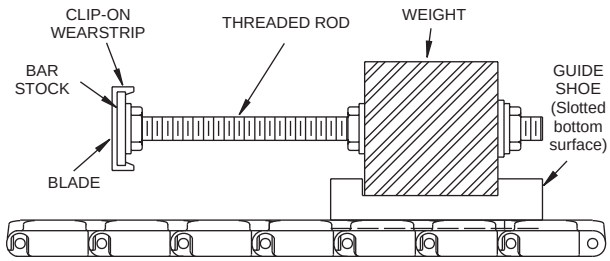


FIG. 2-15 **PUSHER BAR ASSEMBLY**

A dual blade pusher bar is also available for tall or contoured products. The upper blade of this configuration is adjustable up and down and can be extended past or retracted further back from the lower blade.

Adjustment of the pusher bar is dependent upon: 1) placement of the device which limits the pusher bar's forward travel, and 2) dimensions of the product being conveyed. Standard offset is approximately equal to the length of the finger plate to be used: 5.75 in. (146 mm) for **Series 100**, 7.5 in. (191 mm) for **Series 400** and 6.5 in. (165 mm) for **Series 900**.

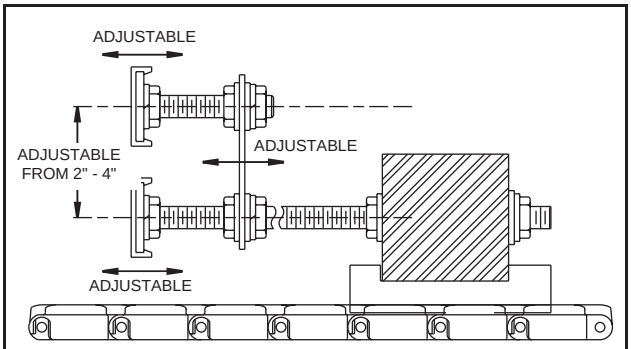


FIG. 2-16 **DUAL BLADE PUSHER BAR ASSEMBLY**

HOLD DOWN ROLLERS

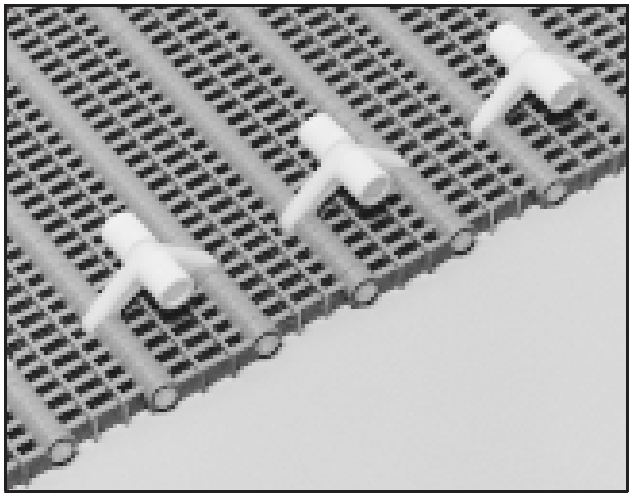
Hold down roller assemblies can be used in place of hold down shoes or rails on wide elevating conveyors. On typical elevating conveyors, the flights have a notch in the centre of the belt so that a hold down rail or shoe can be used to keep the belt on the conveyor frame. Product loss or damage from these shoes is an inevitable side effect.

Standard roller assemblies have a bracket made of acetal, with polypropylene rollers and rods, and are available for the following belt styles:

Series 200 — Flush Grid, Open Grid, Open Hinge, Flat Top and Perforated Flat Top
Series 400 — Flush Grid, Open Hinge and Flat Top
Series 800 — Flat Top and Perforated Top.

Hold down roller assemblies are built securely into the underside of the belt, held in place by the belt's hinge rods. The rollers ride in tracks that anchor the belt in position as it enters the incline of the conveyor. These assemblies can also be used in place of traditional hold down rails or shoes on the side of the conveyor.

Hold down rollers can be placed as frequently as every other belt row, a minimum of 4 in. (102 mm) apart. Normally, 8 in. (203 mm) spacing, every fourth row is sufficient. Sprocket size is limited by the rollers protruding from the bottom surface of the belt. In order to keep the rollers from coming into contact with the shaft, when using a 1.5 in. (or 40 mm) square shaft, the minimum allowable sprocket pitch diameter is 6.4 in. (163 mm). When using a 2.5 in. (or 60 mm) shaft, the minimum sprocket pitch diameter allowable is 7.7 in. (196 mm). Refer to Section Three, Design Guidelines, for more detailed information.



ABRASION RESISTANCE SYSTEM

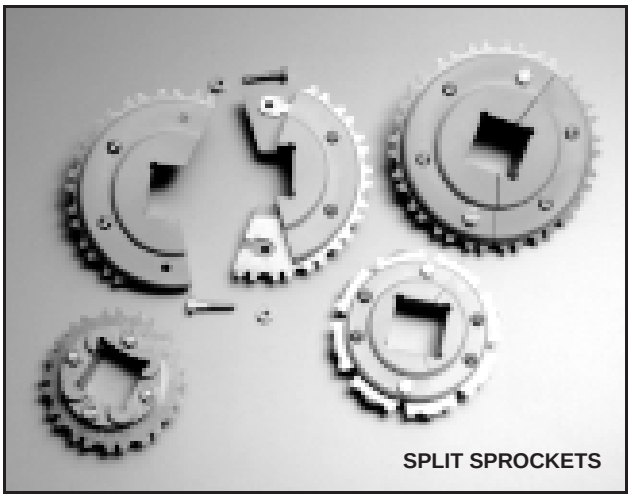
Excessive rod and sprocket wear in abrasive applications can cause a number of undesirable conditions. Aside from the obvious effect of reduced belt life, there can be added difficulties in making repairs. A badly worn rod cannot be removed easily. Often, belt modules are damaged in the process. Worn rods also cause belt pitch to increase, which decreases sprocket engagement and, in turn, increases the wear rate on sprocket teeth. The belt may not run as smoothly as it should under these circumstances.

Intralox has developed stainless steel split sprockets and Abrasion Resistant (AR) hinge rods which enhance the performance of Intralox belts in abrasive or gritty environments. Rigorous testing shows that these AR components significantly outlast standard components and increase belt module life. Abrasive particles are less likely to become imbedded in the harder AR material. Thus, the components themselves do not become abrasive surfaces wearing on the belt.

SPLIT SPROCKETS

Intralox Split Sprockets are an alternative to moulded plastic sprockets for all **Series 100**, **400**, **800**, **900**, and **1100** belts. Pitch diameters and bore dimensions are the same as in the moulded sprockets for these Series. Split Sprockets are constructed from FDA compliant materials, but are not USDA accepted. Refer to the Shaft and Sprocket Data pages in Section Two, **Product Line**, for detailed information.

The old style, all Stainless Steel Abrasion Resistant Sprockets, are still available as special order items. Contact Customer Service for lead-times.



SPLIT SPROCKETS

ABRASION RESISTANT (ALL STEEL) SPROCKETS

ABRASION RESISTANCE HINGE RODS

The AR rods are stiffer than standard rods, so belt pull capabilities are not sacrificed. They are lighter, less expensive and are more flexible than steel rods. They also provide good chemical resistance, low friction, a wide operating temperature range and are FDA compliant for direct food contact.

In all belt styles which employ Intralox's new snap-lock rod retention system, the AR rods are held in place with "rodlets" installed on both edges of the belt. Rodlets are short, headed rods (see FIG. 2-17) which are also made of Abrasion Resistant material. (Intraflex 2000 uses polypropylene rodlets).

Series 400 Flush Grid and Raised Rib with Abrasion Resistant rods, **Series 1100**, **Series 1400** and **Series 2200** belts use a unique, rod retention scheme which does not require a head of any type (see FIG. 2-18 and FIG. 2-20).

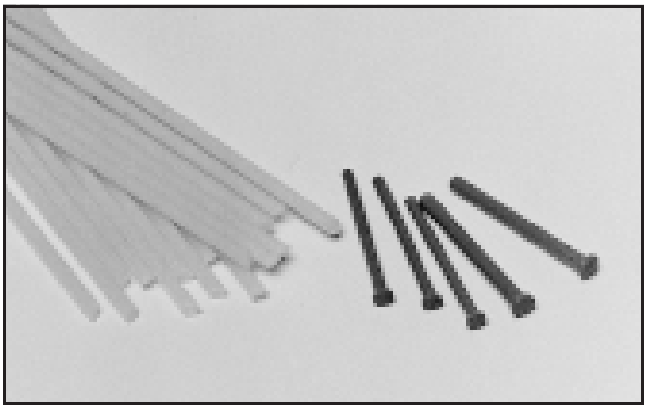


FIG. 2-17 ABRASION RESISTANT RODS AND RODLETS

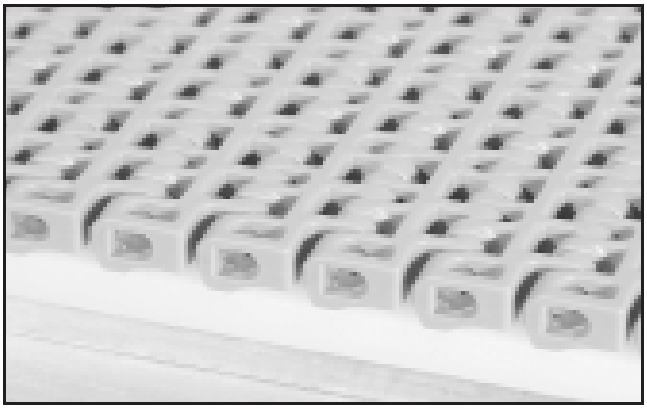


FIG. 2-18 SERIES 1100 SIDE VIEW

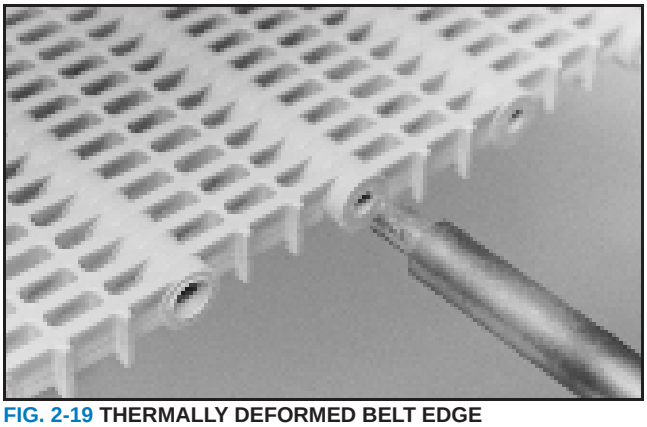


FIG. 2-19 THERMALLY DEFORMED BELT EDGE

SERIES	STYLE	ROD RETENTION SYSTEM
100	All Styles	Snap-Lock Rodlets
200	All Styles except Open Hinge	Thermally Deformed Rod Hole
400	All Styles except Open Hinge	SLIDELOX™ - FG & RR Snap-Lock Rodlets - Flat Top
800	All Styles	Snap-Lock Rodlets
900	All Styles	Snap-Lock Rodlets
1100	Flush Grid	Series 1100 Headless
1400	Flat Top	SLIDELOX™
1800	Flat Top	Series 1800 Headless
2000	Intraflex*	Snap-Lock Rodlets
2200	Flush Grid	Series 2200 Headless
2400	Flush Grid	Series 2400 Headless

*AR rods are not available for Intraflex 2000 in belts 7 in. (178 mm) wide or less.

Series 400 Raised Rib and **Series 1400** Flat Top use the SLIDELOX™ rod retention system. This system uses a shuttle plug to retain the rods during operation. The SLIDELOX™ plug can be easily moved to the side when work on the belt is required.

For other belt styles which use neither the snap-lock nor the headless rod retention systems, the AR rod is retained by thermally deforming the edge of the belt. This partially closes the rod hole with module material, thus retaining the rod (see FIG. 2-19).

To remove a rod after a belt has been in service for some time, apply a soapy solution or other lubricant to the belt hinge. This will help loosen any grit that has become trapped between the rod and the module.

If Abrasion Resistant rods are used in continuously wet, elevated temperature environments, they have a tendency to absorb water and expand in length and width. If an application requires an Abrasion Resistant rod in these conditions, contact Sales Engineering to determine the approximate expansion due to water absorption.

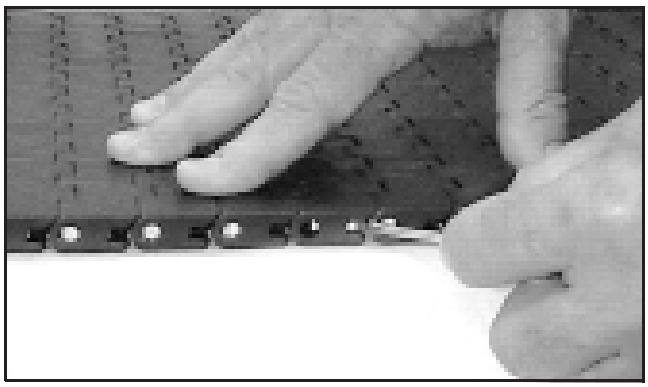


FIG. 2-20 SERIES 1400 WITH SLIDELOX™

TABLE OF CONTENTS

Page #

BASIC CONVEYOR FRAME REQUIREMENTS 3-2
- Dimension Definitions 3-2

DRIVE GUIDELINES 3-4
- Shaft Size and Materials 3-4
- Drive Shaft Torque Loading 3-4
- Power Requirements 3-5
- Retaining Sprockets 3-5
- Use of Round Shafts 3-5
- Intermediate Bearings 3-5
- Rollers as Idle Shafts/Sprocket Replacements 3-6
- Soft Start Motors and Fluid Couplings 3-6

BELT CARRYWAYS 3-6
- Solid Plate Carryways 3-6
- Wearstrip Carryways 3-6
  - Wearstrip Types and Sizes 3-6
  - Wearstrip Arrangements 3-6
- Anti-Sag Carryway Wearstrip Configuration 3-7
- Wearstrip Design Considerations 3-7
  - Temperature Limits 3-7
  - Thermal Expansion and Contraction 3-7
  - Chemical Resistance 3-7
- Rollers as Carryways 3-7

RETURNWAYS AND TAKE-UPS 3-8
- Control of Belt Length 3-8
  - Catenary Sag 3-8
- Back Tension 3-8

Page #

- Standard Returnways 3-9
  - Roller Returnways 3-9
  - Sliderbed Returnways 3-9
- Special Take-Up Arrangements 3-10
  - Gravity Style Take-Up 3-10
  - Screw Style Take-Up 3-10

SPECIAL CONVEYORS 3-11
- Bi-directional Conveyors 3-11
  - Pull-Pull Design 3-11
  - Push-Pull Design 3-11
- Elevating Conveyors 3-13
  - Hold Down Rollers 3-15
  - Friction Modules 3-15
- Sideflexing Conveyors 3-16
- Tight Transfer Methods for Series 1100 3-16

TRANSFER DESIGN GUIDELINES 3-17
- End-Off/End-On Transfers 3-17
  - Finger Transfer Plates 3-17
- 90° Container Transfers 3-19
  - Parabolic Guide Rails 3-19
  - Series 900 and Series 1400 ONEPIECE™ Live Transfer Belt 3-19
- Vacuum Transfer Applications 3-19

SPECIAL DESIGN GUIDELINES 3-20
- Thermal Expansion and Contraction 3-20
- Expansion Due to Water Absorption 3-20
- "Slip-Stick" Effect 3-20

After selecting a belt (series, style and material) and its accessories, the conveyor frame must be designed. Intralox provides the following dimensional data and guidelines, based upon good design principles and practice, for use in designing new conveyor frames or adapting and retrofitting existing ones.

The illustration below identifies most of the components in a conventional, horizontal conveyor. The items shown are only representative of those in common use. There are many variations of components and design details. The designer must become familiar with those available in order to produce the most appropriate and economical conveyor.

In addition to these general design guidelines, Intralox offers the following design literature:

- ***Conveyor Belting Installation and Maintenance - Series 100 to Series 1400;***
- ***Conveyor Design Guidelines - Series 400 Raised Rib for Glass Bottle and Can Handling Pasteurizers;***
- ***Intralox Series 900 Diamond Friction Top Installation Instructions;***
- ***Retrofit Guidelines - Intralox Series 900 Friction Top;***
- ***Intraflex™ 2000 Installation Manual for Spiral Applications;***
- ***Intraflex™ 2000 Installation Manual for Radius Applications;***
- ***Series 2200 Radius Belt Design Guidelines and Installation Instructions; and***
- ***Series 3000 Knuckle Chain Design Guidelines and Installation Instructions.***

Contact Customer Service to request any of these additional guidelines.

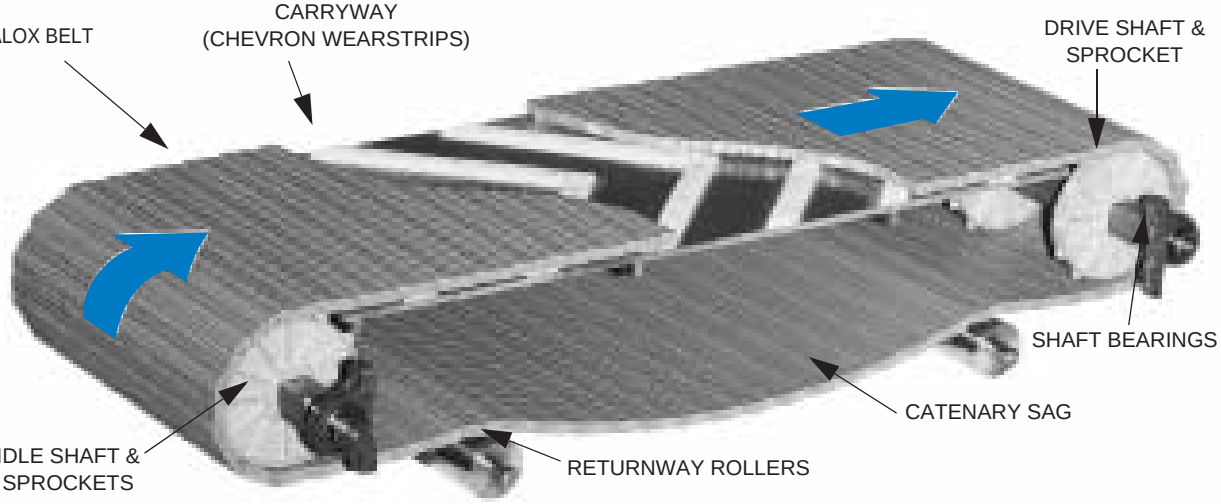


FIG. 3-1 CONVENTIONAL CONVEYOR COMPONENTS

BASIC CONVEYOR FRAME REQUIREMENTS

Regardless of type or configuration, all conveyors using Intralox belts have some basic dimensional requirements. Specifically, dimensions “A”, “B”, “C”, “D” and “E” in the illustrations and tables below should be implemented in any design.

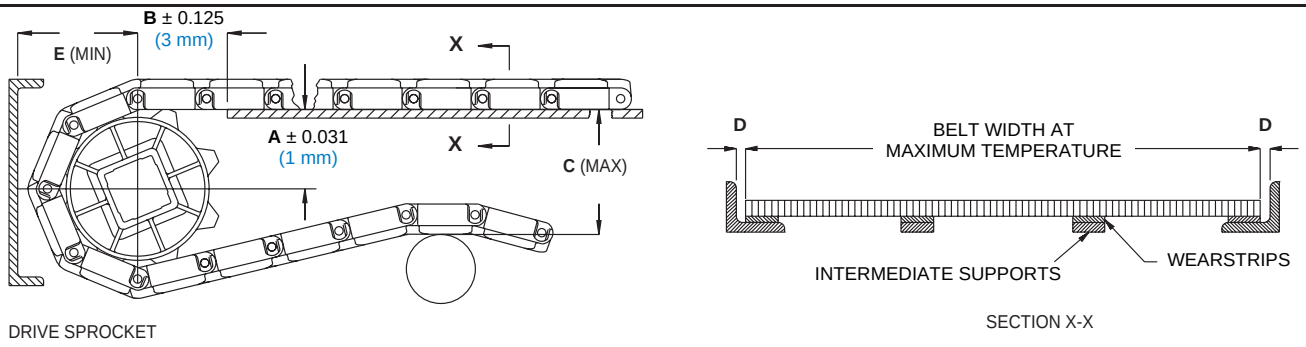


FIG. 3-2 BASIC DIMENSIONAL REQUIREMENTS (ROLLER RETURNWAY)

DIMENSION DEFINITIONS

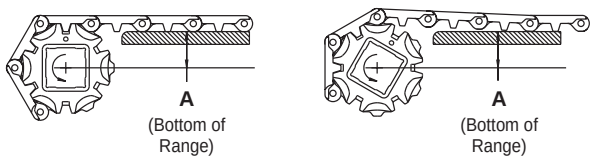
A — The vertical distance between the centerline of the shaft and the top of the carryway.

The belt-to-sprocket engagement and end-off/end-on product transfers are affected by the “A” dimension and the amount of chordal action between the belt and sprockets. Chordal action occurs as each row of modules in a belt rises and falls as it engages the drive sprockets or disengages the idle sprockets. This effect is most pronounced in the large pitch belt/small pitch diameter sprocket combination, such as **Series 800** with 4.0 in. (102 mm) pitch diameter sprockets.

For small pitch diameter sprockets, the “A” dimension is given as a range to indicate when the belt will be horizontal at both the high and low points of the chordal action.

For large pitch diameter sprockets/small pitch belt combinations, the effects of chordal action are small and fall within the allowable tolerance. For these sprockets, a range for the “A” dimension is not necessary.

The bottom of the range is determined when the centre of the module is at the top of the sprocket. At this point, this leading, engaged module is horizontal (see Figure 3-3A). As this row of modules rotates around the sprocket, the next row starts engaging the sprockets and is lifted above horizontal. It returns to horizontal as this row fully engages the sprockets.

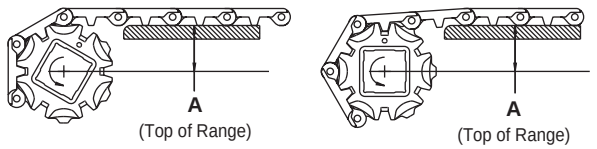


The row of engaging modules is raised above horizontal when the centre of the hinge is at the top of the sprocket, but returns to horizontal as the centre of the module passes the centre of the sprocket.

FIG. 3-3A CHORDAL EFFECTS - BOTTOM OF RANGE

For general applications and applications where end transfer of tip-sensitive product is not critical, use the “A” dimension at the bottom of the range.

The top of the range is determined when the centre of the hinge, between two rows of modules, is at the top of the sprocket. At this point, the leading module is horizontal (see Figure 3-3B). As this row of modules engages the sprockets, the row drops below horizontal. It returns to horizontal as the leading edge of the next row starts to engage the sprockets. This arrangement should not be used with the **Series 800** belts since the underside geometry of the modules may cause chatter on the ends of the wearstrip or wear plate.



The row of engaging modules is horizontal when the centre of the hinge is at the top of the sprocket, but goes below horizontal as the centre of the module passes the centre of the sprocket.

FIG. 3-3B CHORDAL EFFECTS - TOP OF RANGE

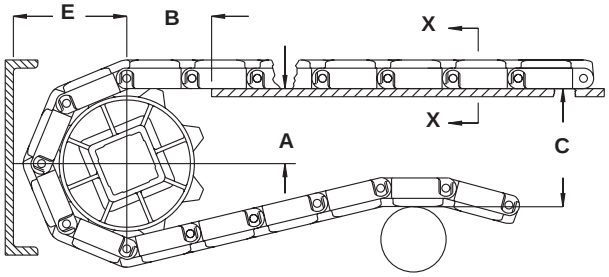
The “A” dimension can be set at any point inside the given range. If an “A” dimension is selected, which is between the top and bottom of the range, the belt will both rise above horizontal and drop below horizontal as each row engages the sprockets.

B — The horizontal distance between the centerline of the shaft and the beginning of the carryway. This dimension assumes that a 0.5 in. (12.7 mm) thick carryway is used, allowing for a typical 0.25 in. (6.4 mm) support and 0.25 in. (6.4 mm) wearstrip. The carryway can be extended to within 0.5 in. (12.7 mm) of the centerline of the shaft if the supports extend between the sprockets (see Figure 3-9).

C — The vertical distance between the top of the carryway and the top of the returnway rails or rollers. This should provide between 180° (min.) and 210° belt wrap around the drive sprockets. The listed dimensions will provide the minimum 180° wrap required for proper engagement.

D — The clearance between the edges of the belt and the side frame member, 0.25 in. (6.4 mm) min. **It should be noted that the minimum edge clearance between side frames and the belt must be determined at the *operating temperature* of the belt**. See the Thermal Expansion and Contraction and Expansion Due to Water Absorption sections on page 3-19 to calculate the *operating* width of your belt at temperatures above ambient.

E — The minimum horizontal distance between the centerline of the shaft and any framework.



A ± 0.031" (1 mm)
B ± 0.125" (3 mm)
C (MAX)
E (MIN)

Complete descriptions of the dimensions are listed on the previous page.

CONVEYOR FRAME DIMENSIONS, in. (mm)						
SPROCKET DESCRIPTION			A	B	C	E
PITCH		NO. TEETH	RANGE BOTTOM TO TOP			
in.	(mm)					
SERIES 100 FLUSH GRID						
2.0	(51)	6	0.69 (18) - 0.83 (21)	1.30 (33)	2.10 (53)	1.24 (31)
3.5	(89)	11	1.53 (39) - 1.60 (41)	1.70 (43)	3.60 (91)	2.01 (51)
6.1	(155)	19	2.82 (72) - 2.87 (73)	2.20 (56)	6.20 (157)	3.30 (84)
SERIES 100 RAISED RIB						
2.0	(51)	6	0.69 (18) - 0.83 (21)	1.30 (33)	2.10 (53)	1.45 (37)
3.5	(89)	11	1.53 (39) - 1.60 (41)	1.70 (43)	3.60 (91)	2.23 (57)
6.1	(155)	19	2.82 (72) - 2.87 (73)	2.20 (56)	6.20 (157)	3.52 (89)
SERIES 200 FLUSH GRID, OPEN GRID, FLAT TOP, PERFORATED FLAT TOP, OPEN HINGE						
4.0	(102)	6	1.42 (36) - 1.69 (43)	2.20 (56)	4.10 (104)	2.38 (60)
6.4	(163)	10	2.77 (70) - 2.92 (74)	3.00 (76)	6.50 (165)	3.61 (92)
10.1	(257)	16	4.72 (120) - 4.81 (122)	3.20 (81)	10.20 (259)	5.50 (140)
SERIES 400 FLUSH GRID, FLAT TOP, OPEN HINGE						
4.0	(102)	6	1.42 (36) - 1.69 (43)	2.20 (56)	4.10 (104)	2.38 (60)
5.2	(132)	8	2.10 (53) - 2.30 (58)	2.60 (66)	5.30 (135)	2.99 (76)
5.8	(147)	9*	2.44 (62) - 2.61 (66)	2.70 (69)	5.95 (151)	3.49 (89)
6.4	(163)	10	2.77 (70) - 2.92 (74)	3.00 (76)	6.50 (165)	3.61 (92)
7.8	(198)	12	3.42 (87) - 3.55 (90)	3.00 (76)	7.90 (201)	4.24 (108)
8.4	(213)	13*	3.75 (95) - 3.87 (98)	3.22 (82)	8.46 (215)	4.74 (120)
10.1	(257)	16	4.72 (120) - 4.81 (122)	3.20 (81)	10.20 (259)	5.50 (140)
SERIES 400 RAISED RIB						
4.0	(102)	6	1.42 (36) - 1.69 (43)	2.20 (56)	4.10 (104)	2.75 (70)
5.2	(132)	8	2.10 (53) - 2.30 (58)	2.60 (66)	5.30 (135)	3.24 (82)
6.4	(163)	10	2.77 (70) - 2.92 (74)	3.00 (76)	6.50 (165)	3.99 (101)
7.8	(198)	12	3.42 (87) - 3.55 (90)	3.00 (76)	7.90 (201)	4.49 (114)
10.1	(257)	16	4.72 (120) - 4.81 (122)	3.20 (81)	10.20 (259)	5.88 (149)
SERIES 800 FLAT TOP, PERFORATED FLAT TOP, MINI RIB, NUB TOP, CONE TOP						
4.0	(102)	6	1.42 (36) - 1.69 (43)	2.20 (56)	4.10 (104)	2.38 (60)
5.2	(132)	8	2.10 (53) - 2.30 (58)	2.60 (66)	5.30 (135)	2.99 (76)
6.5	(165)	10	2.77 (70) - 2.92 (74)	3.00 (76)	6.50 (165)	3.61 (92)
7.7	(196)	12	3.42 (87) - 3.55 (90)	3.00 (76)	7.90 (201)	4.24 (108)
10.3	(262)	16	4.72 (120) - 4.81 (122)	3.20 (81)	10.20 (259)	5.50 (140)
SERIES 800 ROLLER TOP						
4.0	(102)	6	1.42 (36) - 1.69 (43)	1.73 (44)	4.44 (113)	2.81 (71)
5.2	(132)	8	2.10 (53) - 2.30 (58)	1.98 (50)	5.66 (144)	3.43 (87)
6.5	(165)	10	2.77 (70) - 2.92 (74)	2.18 (55)	6.91 (176)	4.05 (103)
7.7	(196)	12	3.42 (87) - 3.55 (90)	2.43 (62)	8.17 (207)	4.68 (119)
10.3	(262)	16	4.72 (120) - 4.81 (122)	2.88 (73)	10.69 (272)	5.94 (151)

*Flush Grid Acetal only.

Refer to **Anti-Sag Carryway Wearstrip Configuration (page 3-6) for alternative layouts for the "B" dimension.

CONVEYOR FRAME DIMENSIONS, in. (mm)						
SPROCKET DESCRIPTION			A	B	C	E
PITCH		NO. TEETH	RANGE BOTTOM TO TOP			
in.	(mm)					
SERIES 900 FLUSH GRID, FLAT TOP, PERFORATED FLAT TOP**						
2.1	(53)	6	0.75 (19) - 0.90 (23)	1.25 (32)	2.28 (58)	1.51 (38)
3.1	(79)	9	1.30 (33) - 1.39 (35)	1.51 (38)	3.20 (81)	1.75 (44)
3.5	(89)	10	1.47 (37) - 1.56 (40)	1.70 (43)	3.60 (91)	2.01 (51)
4.1	(104)	12	1.82 (46) - 1.90 (48)	1.74 (44)	4.25 (108)	2.51 (64)
5.1	(130)	15	2.34 (60) - 2.40 (61)	2.00 (51)	5.20 (132)	2.77 (70)
5.8	(147)	17	2.69 (68) - 2.74 (70)	2.13 (54)	5.80 (147)	3.15 (80)
6.1	(155)	18	2.86 (73) - 2.91 (74)	2.20 (56)	6.20 (155)	3.30 (84)
6.8	(173)	20	3.21 (81) - 3.25 (82)	2.32 (59)	6.75 (171)	3.86 (98)
9.8	(249)	28	4.58 (116)	2.96 (75)	9.70 (246)	5.02 (128)
SERIES 900 RAISED RIB, OPEN GRID**						
2.1	(53)	6	0.75 (19) - 0.90 (23)	1.25 (32)	2.28 (58)	1.73 (44)
3.1	(79)	9	1.30 (33) - 1.39 (35)	1.51 (38)	3.20 (81)	1.97 (50)
3.5	(89)	10	1.47 (37) - 1.56 (40)	1.70 (43)	3.60 (91)	2.23 (57)
4.1	(104)	12	1.82 (46) - 1.90 (48)	1.74 (44)	4.25 (108)	2.73 (69)
5.1	(130)	15	2.34 (60) - 2.40 (61)	2.00 (51)	5.20 (132)	2.99 (76)
5.8	(147)	17	2.69 (68) - 2.74 (70)	2.13 (54)	6.00 (152)	3.40 (86)
6.1	(155)	18	2.86 (73) - 2.91 (74)	2.20 (56)	6.20 (157)	3.52 (89)
6.8	(173)	20	3.21 (81) - 3.25 (82)	2.32 (59)	6.75 (171)	4.08 (104)
9.8	(249)	28	4.58 (116)	2.96 (75)	9.70 (246)	5.24 (133)
SERIES 900 DIAMOND FRICTION TOP, FLAT FRICTION TOP**						
2.1	(53)	6	0.75 (19) - 0.90 (23)	1.25 (32)	2.28 (58)	1.76 (45)
3.1	(79)	9	1.30 (33) - 1.39 (35)	1.51 (38)	3.20 (81)	1.96 (50)
3.5	(89)	10	1.47 (37) - 1.56 (40)	1.70 (43)	3.60 (91)	2.22 (56)
4.1	(104)	12	1.82 (46) - 1.90 (48)	1.74 (44)	4.25 (108)	2.72 (69)
5.1	(130)	15	2.34 (60) - 2.40 (61)	2.00 (51)	5.20 (132)	2.98 (76)
5.8	(147)	17	2.69 (68) - 2.74 (70)	2.13 (54)	6.00 (152)	3.40 (86)
6.1	(155)	18	2.86 (73) - 2.91 (74)	2.20 (56)	6.20 (157)	3.51 (89)
6.8	(173)	20	3.21 (81) - 3.25 (82)	2.32 (59)	6.75 (171)	4.08 (104)
9.8	(249)	28	4.58 (116)	2.96 (75)	9.70 (246)	5.23 (133)
SERIES 1100 FLUSH GRID, FLAT TOP, PERFORATED FLAT TOP						
1.6	(41)	8	0.53 (13) - 0.59 (15)	1.02 (26)	1.70 (43)	1.00 (25.4)
2.3	(58)	12	0.93 (24) - 0.97 (25.4)	1.31 (33)	2.40 (61)	1.37 (35)
3.1	(79)	16	1.31 (33)	1.51 (38)	3.20 (81)	1.75 (44)
3.5	(89)	18	1.51 (38)	1.66 (42)	3.60 (91)	2.15 (55)
3.8	(97)	20	1.70 (43)	1.77 (45)	3.79 (96)	2.13 (54)
4.6	(117)	24	2.08 (53)	1.92 (49)	4.75 (121)	2.60 (66)
5.1	(130)	26	2.28 (58)	1.96 (50)	5.14 (131)	2.73 (69)
6.1	(155)	32	2.85 (72)	2.20 (56)	6.20 (155)	3.30 (84)
SERIES 1100 FLUSH GRID FRICTION TOP						
1.6	(41)	8	0.53 (13) - 0.59 (15)	1.04 (27)	1.61 (41)	1.08 (27)
2.3	(58)	12	0.93 (24) - 0.97 (25.4)	1.30 (33)	2.36 (60)	1.46 (37)
3.1	(79)	16	1.31 (33)	1.55 (39)	3.12 (79)	1.84 (47)
3.5	(89)	18	1.51 (38)	1.66 (42)	3.50 (89)	2.03 (51)
3.8	(97)	20	1.70 (43)	1.77 (45)	3.88 (98)	2.22 (56)
4.6	(117)	24	2.08 (53)	1.97 (50)	4.64 (118)	2.60 (66)
5.1	(130)	26	2.28 (58)	2.06 (52)	5.02 (127)	2.79 (71)
6.1	(155)	32	2.85 (72)	2.25 (57)	6.16 (157)	3.36 (85)
SERIES 1400 FLAT TOP						
5.1	(130)	16	2.26 (57) - 2.32 (59)	2.11 (54)	5.13 (130)	2.88 (73)
5.7	(145)	18	2.59 (66) - 2.63 (67)	2.25 (57)	5.75 (146)	3.25 (83)
6.7	(170)	21	3.07 (78) - 3.10 (79)	2.50 (64)	6.75 (171)	3.75 (95)
SERIES 1400 FLAT FRICTION TOP						
5.1	(130)	16	2.27 (58) - 2.32 (59)	2.11 (54)	5.33 (135)	3.08 (78)
5.7	(145)	18	2.59 (66) - 2.63 (67)	2.22 (58)	5.69 (151)	3.39 (86)
6.7	(170)	21	3.07 (78) - 3.10 (79)	2.44 (62)	6.91 (176)	3.87 (98)

CONVEYOR FRAME DIMENSIONS, in. (mm)						
SPROCKET DESCRIPTION			A	B	C	E
PITCH		NO. TEETH	RANGE BOTTOM TO TOP			
in.	(mm)					
SERIES 1800 FLAT TOP						
5.0	(127)	6	1.77 (45) - 2.10 (53)	1.87 (47)	4.59 (126)	2.91 (74)
6.5	(165)	8	2.62 (66) - 2.87 (73)	2.23 (57)	6.48 (165)	3.68 (93)
8.1	(208)	10	3.45 (88) - 3.65 (93)	2.59 (66)	8.04 (204)	4.46 (113)
10.5	(267)	13	4.67 (119) - 4.82 (123)	3.02 (77)	10.4 (264)	5.64 (143)
SERIES 2000 INTRAFLEX, RAISED RIB						
6.5 BOTTOM	(165)	16	2.55 (65) - 2.61 (66)	2.27 (58)	6.50 (165)	3.90 (99)
6.5 TOP	(165)	16	2.74 (69) - 2.80 (71)	2.00 (51)	6.50 (165)	4.10 (104)
8.1	(206)	20	3.54 (90) - 3.59 (91)	2.27 (58)	8.00 (203)	4.90 (124)
SERIES 2200 FLUSH GRID						
3.9	(99)	8	1.44 (36) - 1.58 (40)	2.42 (61)	4.00 (102)	2.59 (66)
5.3	(135)	11	2.18 (55) - 2.29 (58)	2.93 (74)	5.00 (127)	3.29 (84)
6.3	(160)	13	2.67 (68) - 2.76 (70)	3.23 (82)	6.00 (152)	3.76 (96)
7.7	(196)	16	3.40 (86) - 3.47 (88)	3.62 (92)	8.00 (203)	4.47 (114)
SERIES 2400 FLUSH GRID						
2.0	(51)	6	0.62 (16) - 0.75 (19)	1.22 (31)	2.00 (51)	1.31 (33)
3.9	(99)	12	1.62 (41) - 1.68 (43)	1.86 (47)	3.86 (98)	2.24 (57)
5.1	(130)	16	2.26 (57) - 2.31 (59)	2.11 (54)	5.13 (130)	2.88 (73)
6.4	(163)	20	2.91 (74) - 2.95 (75)	2.31 (59)	6.39 (162)	3.51 (89)
SERIES 2400 FRICTION TOP						
2.0	(51)	6	0.62 (16) - 0.75 (19)	1.22 (31)	2.20 (56)	1.51 (38)
3.9	(99)	12	1.62 (41) - 1.68 (43)	1.86 (47)	4.06 (103)	2.44 (62)
5.1	(130)	16	2.26 (57) - 2.31 (59)	2.11 (54)	5.33 (135)	3.08 (78)
6.4	(163)	20	2.91 (74) - 2.95 (75)	2.31 (59)	6.59 (167)	3.71 (94)
SERIES 3000 KNUCKLE CHAIN						
5.2	(99)	8	2.01 (51) - 2.21 (56)	2.29 (58)	5.23 (133)	3.14 (80)
6.5	(130)	10	2.68 (68) - 2.84 (72)	2.63 (67)	6.47 (164)	3.76 (96)
7.7	(163)	12	3.33 (85) - 3.46 (88)	2.94 (75)	7.73 (196)	4.39 (112)
SERIES 4009 FLUSH GRID						
5.1	(130)	16	2.72 (69) - 2.76 (70)	2.00 (51)	5.49 (139)	3.48 (88)
5.7	(145)	18	3.03 (77) - 3.07 (78)	2.25 (57)	6.09 (155)	3.80 (97)
6.7	(170)	21	3.51 (89) - 3.54 (90)	2.50 (64)	7.09 (180)	4.27 (108)
SERIES 4009 FLAT TOP						
5.1	(130)	16	2.72 (69) - 2.76 (70)	2.00 (51)	5.49 (139)	3,52 (89)
5.7	(145)	18	3.03 (77) - 3.07 (78)	2.25 (57)	6.09 (155)	3,83 (97)
6.7	(170)	21	3.51 (89) - 3.54 (90)	2.50 (64)	7.09 (180)	4,31 (109)
SERIES 4014 FLAT TOP						
5.1	(130)	16	2.72 (69) - 2.76 (70)	2.00 (51)	5.49 (139)	3,64 (92)
5.7	(145)	18	3.03 (77) - 3.07 (78)	2.25 (57)	6.09 (155)	3,95 (100)
6.7	(170)	21	3.51 (89) - 3.54 (90)	2.50 (64)	7.09 (180)	4,43 (113)

SCROLL FRAME DIMENSIONS, in. (mm)					
SCROLL IDLER		A	B	C	
in.	(mm)				
6.0	(152 mm)	3.35 (85)	3.35 (85)	6.80 (173)	
9.0	(229 mm)	4.85 (123)	4.85 (123)	9.80 (249)	

DRIVE GUIDELINES

Intralox square shafts provide maximum efficiency in driving the belt. The two primary advantages are: 1) the positive transmission of torque to the sprockets without keys and keyways, and 2) allowing lateral movement of sprockets to accommodate the inherent differences in thermal expansion or contraction between plastics and metals.

SHAFT SIZES AND MATERIALS

Intralox Inc. USA stocks square shaft materials in Aluminium (6061-T6), Carbon Steel (C-1018) and Stainless Steel (303 and 316) in the following sizes:

Aluminium:	1 in. and 1.5 in.
Carbon Steel:	5/8 in., 1 in., 1.5 in., 2.5 in. and 3.5 in.
303 Stainless Steel:	5/8 in., 1 in., 1.5 in. and 2.5 in.
304 HR Stainless Steel:	3.5 in.
316 Stainless Steel:	1.5 in. and 2.5 in.

Intralox Inc. Europe offers square shaft materials in Carbon Steel (KG-37) and Stainless Steel (304) in the following sizes:

Carbon Steel: 25 mm, 40 mm, 60 mm, 65 mm and 90 mm.
Stainless Steel: 25 mm, 40 mm, 60 mm, 65 mm and 90 mm.

The correct shaft size for your application can be determined by calculations found in the Belt Selection process, page 2-7, or from the formulas beginning on page 4-2.

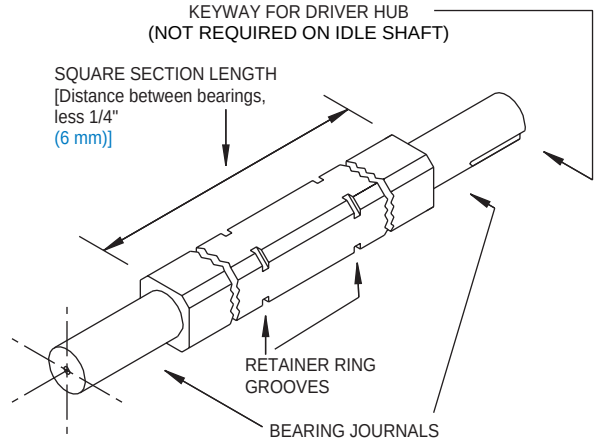


FIG. 3-4 **TYPICAL SHAFT FEATURES**

DRIVE SHAFT TORQUE LOADING

An important consideration in the selection of shaft sizes is the torque loading that the drive shaft must absorb. The belt's pull, acting through the sprockets, introduces the torsional or twisting load on the drive shaft. Under any given set of conditions, i.e., product loading and frictional resistance, the belt pull will remain constant, but torque on the drive shaft will vary with the size of sprockets chosen. *As the sprocket pitch diameter is increased, the torque on the shaft is also increased.* Therefore, if a particular shaft size is desired, but the torque to be absorbed exceeds that recommended by the **Maximum Torque on Drive Shaft** chart on page 4-12, recalculate the torque with the smaller sprocket *if there is a smaller diameter sprocket available in your belt's series*. To achieve the same belt speed, the rotational speed (RPM) must be proportionally greater with the smaller sprocket.

POWER REQUIREMENTS

The power needed to drive the belt can be calculated in the Belt Selection process or from the formulas on page 4-4. It should be noted, this calculated power does not include the power needed to overcome mechanical or other inefficiencies in the system. Since conveyor arrangements and power trains may consist of many possible choices, the following table may assist you in determining the amount of added power needed for your design.

MACHINERY ELEMENTS	AVERAGE MECHANICAL EFFICIENCY LOSSES
Ordinary Sleeve Bearings	2% to 5%
Ball Bearings	1%
Gear Reducers:	
Spur or Helical Gears	
Single Reduction	2%
Double Reduction	4%
Triple Reduction	5%
Worm Gears	
Single Reduction	5%
Double Reduction	10% to 20%
Roller Chains	3% to 5%
V Belts	2% to 4%
Hydraulic Power Systems	(consult manufacturer)

Determine the total efficiency losses in the components to be used and use the calculated power to determine the required **Motor Power** as follows:

$$\textbf{Motor Horsepower} = \frac{\text{Belt Drive Power}}{100\% - \text{Total \% Losses}} \times 100$$

For example, if you determine the total efficiency losses in your system amount to 15% and your belt drive power was calculated to be 2.5 horsepower, the required motor horsepower can be found from:

$$\textbf{Motor Horsepower} = \frac{2.5}{100 - 15} \times 100 = 2.94$$

Therefore, in this case, the appropriate motor power to drive this system would be 3 horsepower.

RETAINING SPROCKETS

It is usually necessary to laterally retain only one sprocket on each of the drive and idler shafts. This sprocket will provide the positive tracking necessary to keep the belt running properly between side frames of the conveyor. By allowing the other sprockets to move laterally, thermal expansion differences between the belt and frame are easily accommodated. By convention, Intralox recommends the sprocket adjacent to or on the belt's centerline be retained using retainer rings on both sides of the sprocket. When only two sprockets are used, retain the sprockets on the drive journal side of the conveyor.

In some cases, the "centre" sprocket will be slightly offset from the centerline of the belt. In **Series 1100**, the centre sprocket will be 0.5 in. (13 mm) off centre when the belt width is an odd number of inches wide, e.g., 7 in. or 9 in. (or an odd multiple of 25.4 mm). **Series 2200** sprockets will always be 0.25 in. (6.4 mm) off centre.

If a Radius Belt Standard Edge or Tabbed Edge wearstrip is used to contain the **Series 2200** belt up to the sprockets, it is not recommended that any sprockets be retained on the shaft. In this case, the wearstrip is used to maintain the belt's lateral position. For more information on **Series 2200**, refer to the **Radius Belt Design Guidelines and Installation Instructions**.

USE OF ROUND SHAFT

Intralox recommends the use of square shafting. However, **Series 900, Series 1100** and **Series 1400** sprockets are available in round bore sizes. (See the appropriate SPROCKET DATA tables for detailed information.)

NOTE: Round bore MOULDED and split sprockets are frequently furnished with two keyways. Use of two keys is NOT REQUIRED, nor recommended.

INTERMEDIATE BEARINGS

On wide belt systems or those under heavy tension loads, an additional bearing (or bearings) may be needed to support the centre of the drive and idler shafts to reduce deflection to acceptable levels. Excessive drive shaft deflection will cause improper belt-to-tooth engagement, a condition which should be avoided.

When intermediate bearings are considered, the shaft deflection formulas are different from the one which applies to shafts supported by only two bearings. With a third bearing, *located in the centre of the shaft*, the deflection formula (see page 4-3) is straightforward and easy to apply.

$$D_3 = \frac{1}{185} \times \frac{\frac{w}{2} \times L_{S^3}}{E \times I}$$

$$= \frac{w \times L_{S^3}}{370 \times E \times I}$$

where: **D** = Deflection, in. (mm)
w = Total shaft load, lb (kg)
L_S = Shaft length *between bearings*, in. (mm)
E = Modulus of Elasticity, lb/in^2 (kg/mm^2)
I = Moment of Inertia, in.^{4} (mm^4)

However, *when the third bearing is placed off centre, or when more than three bearings are used*, the analysis is so complicated that convenient general formulas for deflection cannot be given. A simpler approach is to allow the designer to determine a *safe maximum span length*, using the charts on page 4-13. After calculating the **TOTAL SHAFT LOAD, w,** the maximum span for available shaft sizes and materials is easily determined. **Tables 10A** and **10B** are for Conventional Conveyors using two bearings and three or more bearings. **Tables 10C** and **10D** are the corresponding curves for Bi-directional and Pusher Conveyors.

Intermediate bearings usually are Split Journal Bearings. They should be mounted on the conveyor frame with the split of the bearing housing perpendicular to the direction of the belt travel. (Note: if the split is parallel with the belt travel, its load capacity is reduced significantly.) In cases requiring intermediate bearings, it is prudent to utilize sprockets with the largest practical diameter because of the rather large housing dimensions. Otherwise, a bearing modification may be needed to allow it to fit the limited space available.

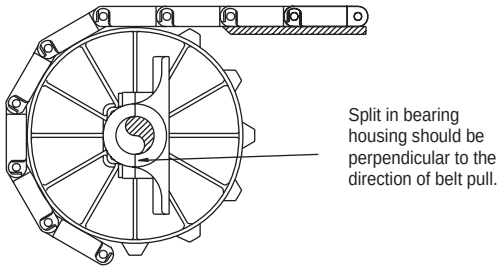


FIG. 3-5 INTERMEDIATE BEARINGS RECOMMENDED MOUNTING ARRANGEMENT

ROLLERS AS IDLE SHAFTS AND SPROCKET REPLACEMENTS

In many applications, idle shafts and their sprockets may be replaced by rollers made of steel pipe, supported by stub shafts. These pipe rollers can be considerably stiffer than a comparable length of solid, square shafting. For example, a 4 in. (102 mm) — Schedule 40 pipe and a 6 in. (152 mm) — Schedule 40 pipe have more than twice the stiffness of 2.5 in. (63.5 mm) and 3.5 in. (88.9 mm) square steel shafts, respectively. Therefore, in cases where loads are high and the belt is wide, the use of rollers such as these may eliminate the need for intermediate bearings to reduce shaft deflection to acceptable levels. Flanging or spooling of the ends of the rollers to retain the belt laterally is necessary in some cases.

Scroll idlers can also be used in place of idle sprockets. (See the **Special Application Accessories** pages in Section Two, **Product Line**.) Scroll idlers are used to help keep the returnway clean and free of debris.

SOFT STARTING MOTORS AND FLUID COUPLINGS

Rapid starting of high speed or loaded conveyors is detrimental to good belt and sprocket life. This will also cause adverse effects on the entire drive train. When the motor power exceeds 1/4 horsepower per foot of belt width (612 watts per meter), Intralox strongly recommends the use of soft starting electric motors or one of the several fluid couplings (wet or dry) presently available. These devices allow the driven conveyor to accelerate gradually to operating speeds, which is beneficial for all components.

BELT CARRYWAYS

Intralox belting can be supported in the load-bearing part of its travel by carryways of various arrangements. Since their primary purposes are to provide a lower friction running surface and to reduce wear on both the belt and the frame, it is wise to give careful consideration to this part of the design.

The carryway belt contact surfaces may be of metal, usually cold-rolled finished Carbon or Stainless Steel, or one of the commonly used plastics available from Intralox. Please refer to the belt data pages in Section Two, **Product Line**, or **Tables 2A** and **2B** on page 4-9 for frictional characteristics of each. Also refer to the wearstrip data on page 3-6 for a description of the plastic strips available from Intralox.

SOLID PLATE CARRYWAYS

These are continuous sheets of metal, UHMW or HDPE over which the belt slides. The plates may be perforated with slots or holes to allow for drainage and the passage of foreign material. In heavily loaded applications, this type of carryway surface is considered a good choice because of the continuous support it provides to the belt.

WEARSTRIP CARRYWAYS

All wearstrips are available in Ultra High Molecular Weight (UHMW) Polyethylene. Certain styles are also available in High Density Polyethylene (HDPE) and Molybdenum-filled nylon (Nylatron).

Wearstrip types and sizes

Intralox can provide wearstrips of three different types:

- **Standard flat wearstrips** are relatively thick, narrow, flat bars of UHMW, HDPE or Nylatron. UHMW and HDPE flat wearstrips are available in 0.25 in. (6.4 mm) thick x 1.25 in. (31.8 mm) wide x 10 ft. (3 m) lengths. Molybdenum-filled nylon (Nylatron) flat wearstrips are available in 0.125 in. (3.2 mm) thick x 1.25 in. (31.8 mm) wide x 8.5 ft. (2.6 m) lengths. The strips are applied directly to the frame and attached with plastic bolts and nuts in slotted holes. This allows the strips to expand and contract freely with temperature changes.
- **Flat finger-joint wearstrips** have a notched-end design (FIG. 3-6) which provides an overlapping section for continuous belt support without sharp edges. These 0.25 in. (6.4 mm) thick wearstrips are fastened in short lengths at the leading end only, with a 0.375 in. (9.5 mm) gap, to provide freedom for elongation caused by temperature changes. They are available in UHMW and HDPE.
- **Angle and clip-on wearstrips** normally are used in applications where belt edge protection is needed or lateral transfer is required. They are available in lengths of 10 ft. (3 m) in UHMW. In addition to the standard angle wearstrip, several specially **clip-on** or **snap-on** strips are available. These strips attach to the frame without the need of fasteners. Refer to pages 2-78 and 2-79 for more information on available wearstrips.

Wearstrip arrangements

- **Straight, parallel runners** These supports consist of strips, either metal or plastic, placed on the frame parallel with the belt's travel. While relatively inexpensive to install, their disadvantage is that belt wear is confined to the narrow areas in contact with the strips. This arrangement is recommended, therefore, in low-load applications only.

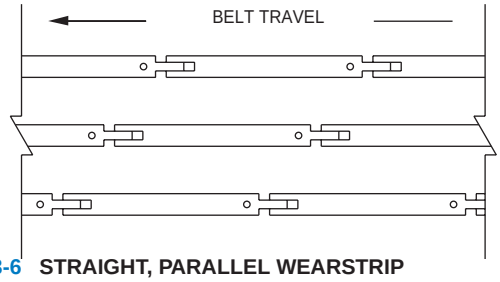


FIG. 3-6 STRAIGHT, PARALLEL WEARSTRIP ARRANGEMENT

- **Chevron array** By placing the strips in an overlapping "V" or Chevron array, the underside of the belt is supported across its full width as it moves along the carryway. Thus the wear is distributed evenly. The angled surfaces can be effective in removing gritty or abrasive material from the underside of the belt. A minimum 0.4 in. (10.2 mm) gap is recommended between the points of the wearstrip to reduce debris build up. This arrangement is also good for heavily loaded applications. By reducing the spacing between adjacent chevrons, the bearing load on the strips and the belt's unsupported span is decreased.

Standard flat wearstrips can be modified to form the Chevron array.

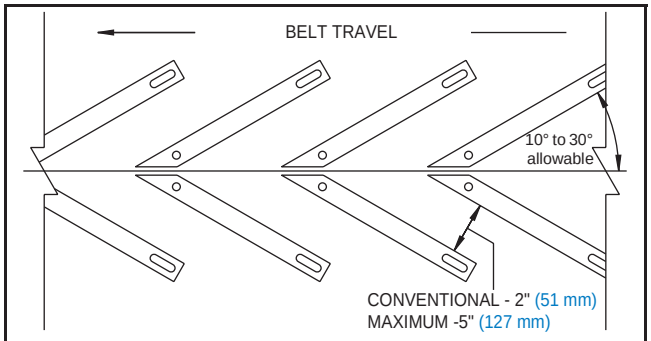


FIG. 3-7 CHEVRON WEARSTRIP ARRANGEMENT

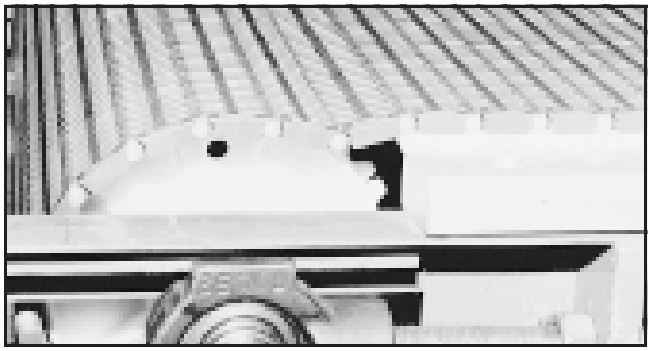


FIG. 3-8 BUCKLING BELT ROWS

ANTI-SAG CARRYWAY WEARSTRIP CONFIGURATION

Under certain conditions, belts will require more carryway support near the sprockets. This is due to the belt tension not being great enough to support product between the end of the wearstrip support and the beginning of the sprocket support. Without adequate support, the belt may buckle, as shown in Figure 3-8. This buckling can be eliminated by extending the wearstrip supports, between the sprockets, to within 0.5 in. (12.7 mm) of the shaft centerline (Figure 3-9).

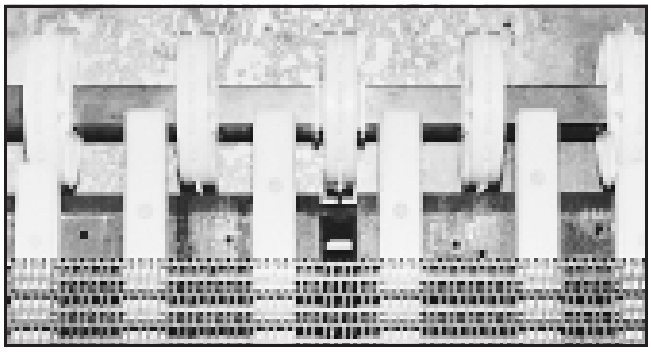


FIG. 3-9 ANTI-SAG CONFIGURATION

Series 900 and **Series 1100** belts may need more support than normally required under heavy product loads. To prevent the belt from sagging or bowing under the weight, the wearstrips should be placed so that the unsupported spans between the strips, in parallel or chevron array, do not exceed 2 in. (50.8 mm). The unsupported span of 2 in. (50.8 mm) is measured perpendicular to the support structure (FIG. 3-9), regardless of the angle of the support to the direction of belt travel.

WEARSTRIP DESIGN CONSIDERATIONS

Temperature limits

UHMW flat and angle wearstrips are recommended to 160 °F (71 °C). HDPE is recommended to 140 °F (60 °C); Molybdenum-filled nylon (Nylatron) up to 250 °F (121 °C). UHMW clip-on wearstrips are recommended to 210 °F (99 °C).

Thermal expansion and contraction

Installation of Intralox flat and angle wearstrips should allow for thermal expansion and contraction. See Thermal Expansion and Contraction on page 3-19 for Coefficients of Expansion. At operating temperatures of 100 °F (38 °C) or less, it is sufficient to bevel-cut the opposing ends of strips at an angle of 30° from the horizontal and provide a clearance gap of 0.30 in. (7.6 mm). At temperatures exceeding 100 °F (38 °C), the angle of the cut should be 60°. The clearance should be determined from thermal expansion calculations. It is recommended that wearstrip joining locations be staggered for smooth belt operation.

Chemical resistance

Please refer to the Polyethylene columns of the **Chemical Resistance Guide**, beginning on page 4-15 for information on UHMW and HDPE wearstrips.

ROLLERS AS CARRYWAYS

Rollers are not usually used on new applications because they do not provide a continuous supporting surface. The chordal action, as the modules pass over the rollers, will often create problems if product tippage is critical. However, on converted units, rollers are sometimes employed, especially where bulk products are to be conveyed.

RETURNWAYS AND TAKE-UPS

The return side of conventional conveyors using Intralox belts are generally exposed to relatively low tension loads, but nonetheless, are very important in the overall design. NOTE: On bi-directional and push-pull conveyors where return side tensions are high, special attention must be paid to this part of the design. See page 3-10 for these cases.

CONTROL OF BELT LENGTH

One of the principal functions of the returnway is to properly accommodate the increase (or decrease) in the length of the belt while operating. Control of belt length is vital in maintaining sufficient tension of the belt after it engages the drive shaft sprockets. A belt which increases in length can disengage from its drive sprockets if proper design criteria are not followed. A belt which contracts due to cold temperatures may cause over-tensioning and excessive shaft loads if some surplus belt is not provided. Belts will either elongate or contract in operation because of these factors:

- **Temperature variations**
  Assuming belts are installed at average ambient conditions, normally about 70 °F (21 °C), any significant temperature change in operation will result in contraction or elongation of the belt. This thermal contraction or expansion is dependent upon the *belt's material*, the *difference in temperatures* and *the overall length of the belt*. Please refer to the section on **Thermal Expansion and Contraction** on page 3-19 to determine the temperature effects in your application.
- **Elongation (strain) under load**
  All belts will elongate if tension is applied. The amount of increase in length will depend upon the belt Series and Style, the belt's material, the amount of tension or "belt pull" applied, and the operating temperature. Generally speaking, on conventional conveyors where the **ADJUSTED BELT PULL (ABP)** is about 30% of **ALLOWABLE BELT STRENGTH (ABS)**, this load-induced elongation is approximately 1% of the conveyor's length. If **ABP** reaches the **ABS**, this strain should not exceed 2.5% of the conveyor's length.
- **Elongation due to break-in and wear**
  New belts will usually experience elongation in the first days of operation as the hinge rods and modules "seat" themselves. In some severe services where heavy loads exist or abrasives are present, older belts will experience elongation due to wear of the hinge rods and enlargement of the modules' hinge rod holes.

Catenary sag

As a belt expands or contracts, it is necessary to accommodate the change in belt length. One of the most common methods for controlling belt length is to provide one or more unsupported sections on the return side in which the belt may sag. This method of controlling belt length is referred to as the **Catenary Sag Method**. Since these unsupported sections of belt hang under their own weight, they approximate the shape of "catenary curves". These curves are able to store the excess belt by increasing in depth between the top and bottom of the curve. If more than one unsupported returnway section exists, the excess belt length is distributed among all the unsupported sections. Thus, the more of the returnway that is equipped with these catenary sections, the less vertical space is needed to store the excess belt length. For applications that will experience a large amount of expansion in length, other take-up arrangements may be required. See page 3-9 for an explanation of these alternate arrangements.

BACK TENSION

An adequate amount of returnway tension is needed directly after the drive sprocket for proper belt-to-sprocket engagement. This tension is commonly referred to as ***back tension***. The span length and depth of the first catenary sag section directly after the drive sprockets provide this back tension. Back tension is increased as the span is **increased** or as the depth is **decreased**. The depth of this catenary section should not be allowed to exceed the recommendations in the following illustrations for this reason. Care should also be taken to avoid allowing the sagged belt to "bottom-out" on the conveyor frame. This will greatly reduce the back tension and may cause sprocket disengagement.

The roller directly after the drive sprocket, commonly referred to as a "snub" roller, should be placed so that the belt is wrapped between 180° and 210° around the drive sprockets (see the "C" dimension on page 3-3).

In the design of conventional conveyors, it is seldom necessary to know precisely the amount of sag and tension required for good belt-to-sprocket engagement. In cases when catenary sag is used to accommodate belt length changes, it may be necessary to know the length of the additional or excess belt which is hanging between two adjacent supports and the tension created by that hanging section. These can be determined from formulas found on page 4-5. These simplified formulas give close approximations for predicting the results of catenary sag conditions. The actual formulas for catenary curves are more complex. However, in practice, where the span-to-sag ratio is large, these simpler formulas are sufficiently accurate for most applications. For example, with a span-to-sag ratio of 10 to 1, the error in the tension formulas is approximately 2%.

STANDARD RETURNWAYS

The following illustrations provide recommended returnway arrangements which have proven successful in many applications.

On very short conveyors, less than 6 ft. (2 m) long, a returnway support usually is unnecessary. The catenary sag between drive and idler sprockets alone is sufficient for good operation if the sag is limited to a maximum of 4 in. (102 mm).

Roller returnways

As the length of the conveyor increases, it is necessary to provide intermediate support rollers in the returnway, but it is most important the belt be unsupported for a significant part of the total length, as shown in the following figures.

Sliderbed returnways

If a slide bed is used as part of the returnway, it should begin at least 24 in. (0.6 m) from the drive sprockets on short belts, less than 12 ft. (3.6 m) long, or 36 in. to 48 in. (1 m to 1.2 m) from the drive sprockets on longer belts. A combination of return rollers and a slide bed can also be used. See Figure 3-12 for more details.

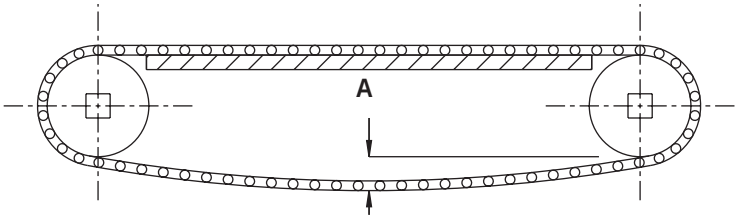


FIG. 3-10 SHORT CONVEYORS (less than 6' [1.8 m])

A - The amount of catenary sag between each set of return rollers on longer conveyors or between the drive and idle sprockets on short conveyors should be between 1 in. (25.4 mm) and 4 in. (102 mm).

B - The snub roller should be placed 9 in. (0.23 m) to 18 in. (0.46 m) from the drive and idle shaft. The snub roller should be placed so that the belt has between 180° and 210° of wrap around the sprocket.

C - The returnway rollers should be spaced 36 in. (0.9 m) to 48 in. (1.22 m) apart for all series belts except **Series 100**, **400** and **2000**, which should have a 48 in. (1.22 m) to 60 in. (1.52 m) spacing. This, in combination with **A** and **B**, should provide the proper amount of return side tension for good sprocket engagement.

D - The minimum roller diameter is 2 in. (51 mm) for belts up to 1.07 in. (27 mm) pitch and 4 in. (102 mm) for larger pitch belts.

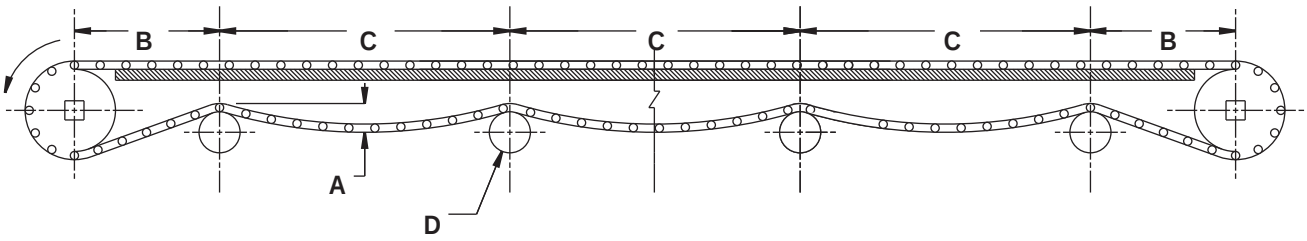


FIG. 3-11 MEDIUM TO LONG CONVEYORS (6' [1.8 m] and longer)

E - Slide beds should begin at least 24 in. (0.6 m) from the drive sprockets on conveyors less than 12 ft. (3.6 m) long and 36 in. (0.9 m) to 48 in. (1.22 m) from the drive sprocket on longer belts.

A combination of return rollers and a slide bed can also be used.

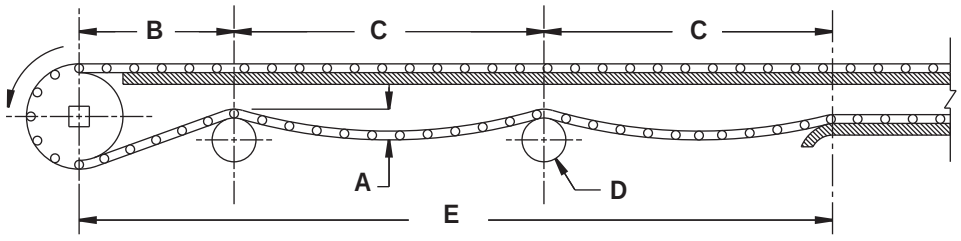


FIG. 3-12 CONVEYORS WITH SLIDE BEDS

SPECIAL TAKE-UP ARRANGEMENTS

Catenary sag may be described as a dynamic take-up. In many applications it does not provide adequate tension to prevent sprockets from slipping. In these cases, other types of take-ups are required.

• Gravity style take-ups

Gravity style take-ups usually consist of a roller resting on the belt in the returnway. Its weight provides the tension needed to maintain proper sprocket engagement. The weight is most effective when placed near the drive shaft end of the returnway. These take-ups are recommended for conventional conveyors which are:

1. over 75 ft. (23 m) long, or
2. over 50 ft. (15 m) long with belt speeds over 150 ft/min (30 m/min), or
3. exposed to large temperature variations, or
4. operated at speeds over 50 ft/min (15 m/min), *and* with frequent starts under loads of over 25 lb/ft² (120 kg/m²).

For 1 in. (25.4 mm) pitch belts, a 4 in. (102 mm) diameter roller with a weight of 10 lb/ft (15 kg/m) of belt width is recommended. For 2 in. (50.8 mm) pitch belts, the recommended specifications are 6 in. (152 mm) diameter and 20 lb/ft (30 kg/m) of belt width.

• Screw style take-ups

Screw style take-ups shift the position of one of the shafts, usually the idler, through the use of adjustable machine screws. The shaft bearings are placed in horizontal slots in the conveyor frame. The screw style take-ups are used to move the shaft longitudinally, thus changing the length of the conveyor. *Screw take-ups* should be used *only* to make minor adjustments to return the catenary sag to its best position. They *should not be used as primary length control devices*.

The *disadvantages* of screw take-ups are that *shafts can be misaligned* easily, and the *belt can be over tightened*, reducing belt and sprocket life as well as *increasing shaft deflection*.

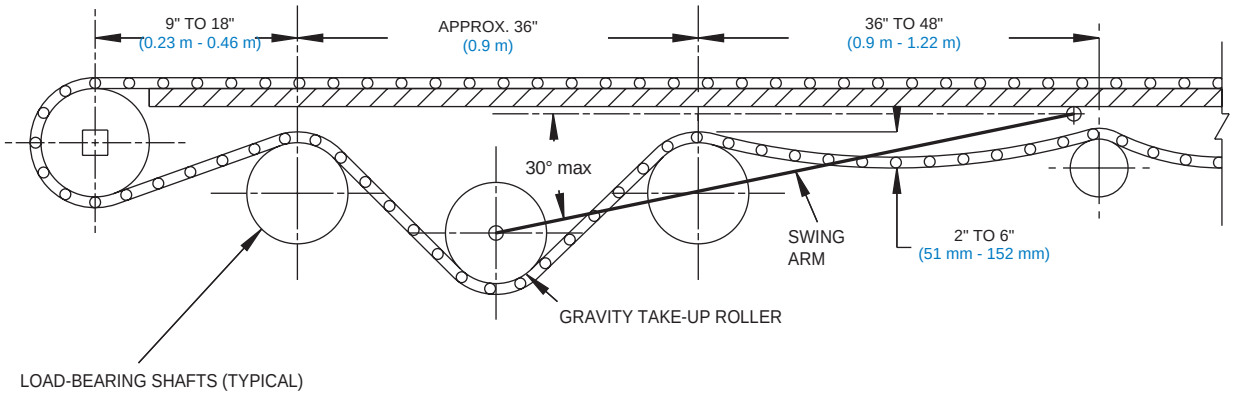


FIG. 3-13 GRAVITY STYLE TAKE-UP

SPECIAL CONVEYORS

BI-DIRECTIONAL CONVEYORS

Bi-directional conveyors are usually designed in two basic drive configurations: the **Pull-pull** type and the **Push-pull** type. There are some features common to both, but each has certain advantages and disadvantages. The illustrations and comments below describe the differences between the two types.

Pull-pull designs

There are three common variations of the Pull-pull type, notably the centre-drive method, the two-motor drive method and the single-motor and slave-drive method.

• Centre-drive design

The centre-drive is shown in Fig 3-14. The *reversible* drive shaft is placed in the returnway near the centre of the conveyor. This drive shaft should be placed to allow adequate belt tension to develop on both sides of the returnway with catenary sag sections. Notice that the rollers designated as "**A**" in the illustration are load-bearing. The shafts and bearings which support them should be so designed.

Centre-drive bi-directional conveyors, when designed correctly, afford excellent operating characteristics because sprocket engagement occurs over 180° of rotation. In addition, only one reversing motor is required.

NOTE: Because belt tension is applied alternately to both the carryway side and returnway side of the shafts at opposite ends of the conveyor, these shafts must be designed for twice the belt tension determined by calculations of the **ADJUSTED BELT PULL, (ABP)**. *Therefore, the shaft deflection calculations and sprocket spacing determination should be based upon two times the Adjusted Belt Pull*. Because of these larger shaft loads, it is sometimes necessary to use very large shafts, or to use rollers in lieu of idle sprockets and shafts on these designs.

• Two-motor drive design

The two-motor drive design has the advantage of relatively low returnway belt tension, but requires additional hardware (an additional motor and slip clutches) and electrical control components. Despite the additional equipment needed, on extremely large units with heavy loads, this is often the most practical drive system.

• Single-motor and slave-drive method

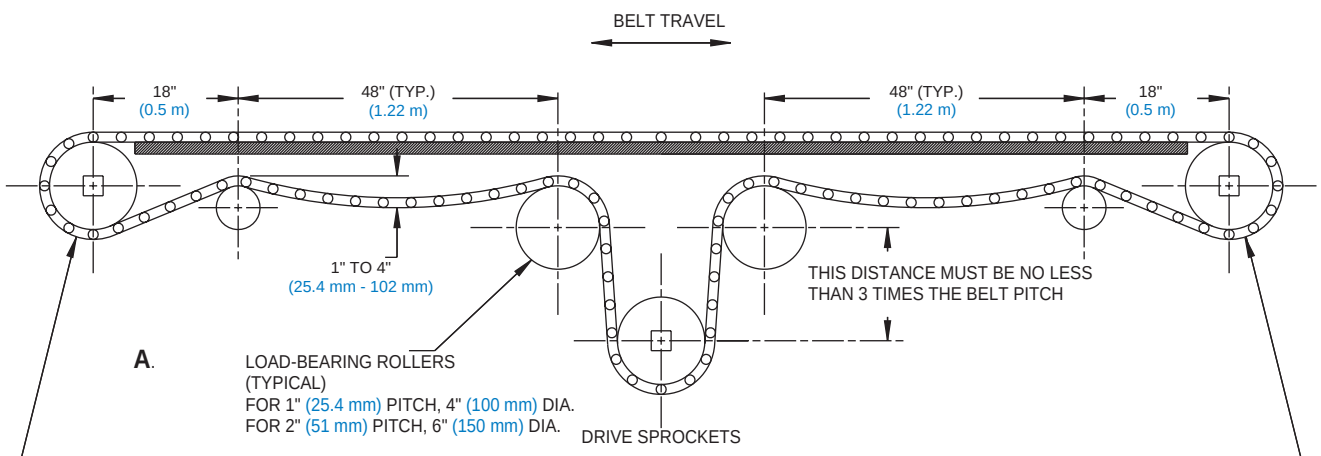
The single-motor (reversible) employing a roller chain, alternately driving either of two chain sprockets on the conveyor shafts, is another low-tension option. It is also expensive because of the additional hardware required. This drive system is usually limited to short conveyors because of the length of roller chain involved.

Push-pull designs

Push-pull bi-directional conveyors (FIG. 3-15) require special attention to returnway tension, shaft deflection and sprocket spacing. When the driving shaft is *pulling* the load towards itself, the conveyor acts like other conventional units. *When the direction of belt travel is reversed*, the drive shaft is *pushing* the loaded belt. In this situation, i*f the return side tension is not greater than the carryway tension, sprocket slipping or jumping will occur*. Excess belt may buckle upwards in the carryway interfering with product handling.

It is vital to design a Push-pull bi-directional conveyor with the required return side belt tension. Experience has shown this needs to be about 120 percent of the *carryway side* **ADJUSTED BELT PULL (ABP)**. See the **Belt Selection Instructions** in Section Two, **Product Line**, page 2-7, or refer to the formulas on page 4-2. Having determined the carryway side ABP, the returnway tension is:

Required Returnway Tension = 1.2 x ABP



Rollers may be substituted for sprockets to avoid using intermediate bearings. On conveyors having a length of no greater than twice the width, unspooled rollers may be used. On longer conveyors the rollers should be spooled allowing 3/16 in. (5 mm) to 3/8 in. (10 mm) clearance between the inside of the flange and the belt edges.

NOTE: For belts operating at temperatures above ambient, this clearance should exist at operating temperature.

FIG. 3-14 CENTER-DRIVEN BI-DIRECTIONAL CONVEYOR

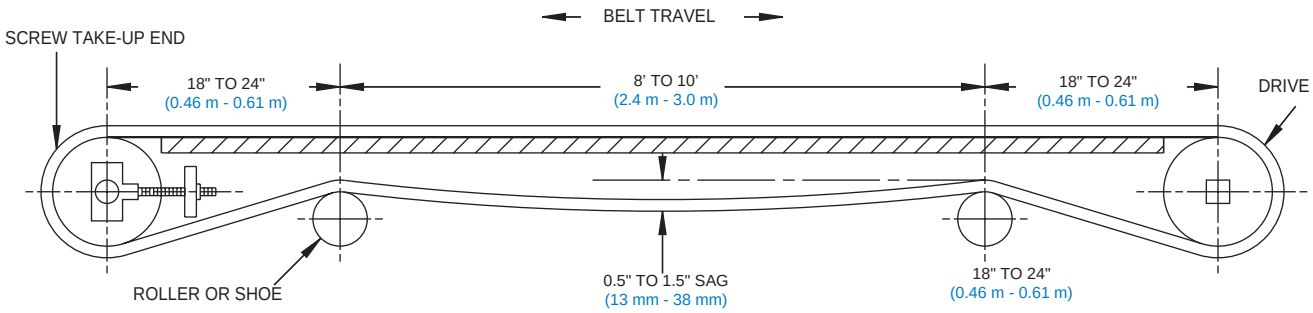


FIG. 3-15 PUSH-PULL BI-DIRECTIONAL CONVEYOR

• Effect on shaft deflection and sprocket spacing

Since *both drive and idler shafts* will experience a tension load *as the belt approaches and leaves* the sprockets, the total shaft loading is *more than twice* that of a conventional uni-directional conveyor. Therefore, when calculating the shaft deflection, it is most important to increase the Total Running Shaft Load for the added belt tension. The *corrected* Adjusted Belt Pull can be found from:

Corrected ABP = 2.2 x ABP

Use this value in calculating the Total Shaft Load and Shaft Deflection. Formulas for these may be found in the **Belt Selection Instructions** on page 2-7, or in Section Four, **Formulas and Tables**, page 4-3. Because the belt is tensioned on *both* sides of the sprockets, *a greater shaft deflection of about 0.22 in. (5.6 mm) is tolerable* for these conveyors.

The **Corrected ABP** should also be used in determining the proper spacing of shaft sprockets. See the **Drive Shaft Sprocket Spacing** chart in the **Product Line** section for the belt being considered. Remember that *both shafts* should be considered as drive shafts for deflection and sprocket spacing calculations.

The power and torque needed to drive the Push-pull unit is not affected by the returnway tension, however, the greater shaft loading does affect the loads on bearings. The designer is therefore cautioned to allow for this additional load in the selection of the shaft bearings.

ELEVATING CONVEYORS

Elevating conveyors are similar to horizontal units with several design differences required for good operation. First, *the upper shaft is strongly recommended as the drive shaft*. The extreme difficulty of "pushing" product up an incline precludes this as a viable alternative. Second, as the angle of incline increases, the effectiveness of catenary sag as a method of length control decreases. *It is always recommended that some mechanical form (screw or spring) of take-up be employed on the lower or idler shaft.*

Elevators almost always involve the use of flights and sideguards which present special requirements in the design. For example, shoes or slide beds on the return side must be designed so these flights or sideguards will not interfere with the smooth operation of the conveyor. The illustrations and comments in Figures 3-17 through 3-21 show five different variations of elevating conveyors.

GENERAL NOTES ON ELEVATING CONVEYORS:
THESE NOTES APPLY TO FIGURES 3-17 TO 3-21.

A. If sprockets are used at intermediate points, the centre sprockets are NOT retained. If rollers or shoes are used, a 3 in. (76 mm) minimum radius is required for 1 in. (25.4 mm) pitch belts; a 5 in. (127 mm) minimum radius for 2 in. (50.8 mm) pitch belts.

B. To minimize wear, the hold down shoe radius should be as large as the application will allow, up to 36 in. (1 m). The minimum radius should be 6 in. (152 mm).

C. Internal roller or shoe should have a minimum diameter of 3 in. (76 mm).

D. Consider a drum or scroll on the idle end if product or foreign materials are expected to fall between the belt and the sprockets.

E. Keep drip pans clear of flights and sideguards between drive sprockets and the first shoe or roller.

F. For proper sprocket engagement, do not allow belt sag to develop between the drive sprocket and the first roller or shoe.

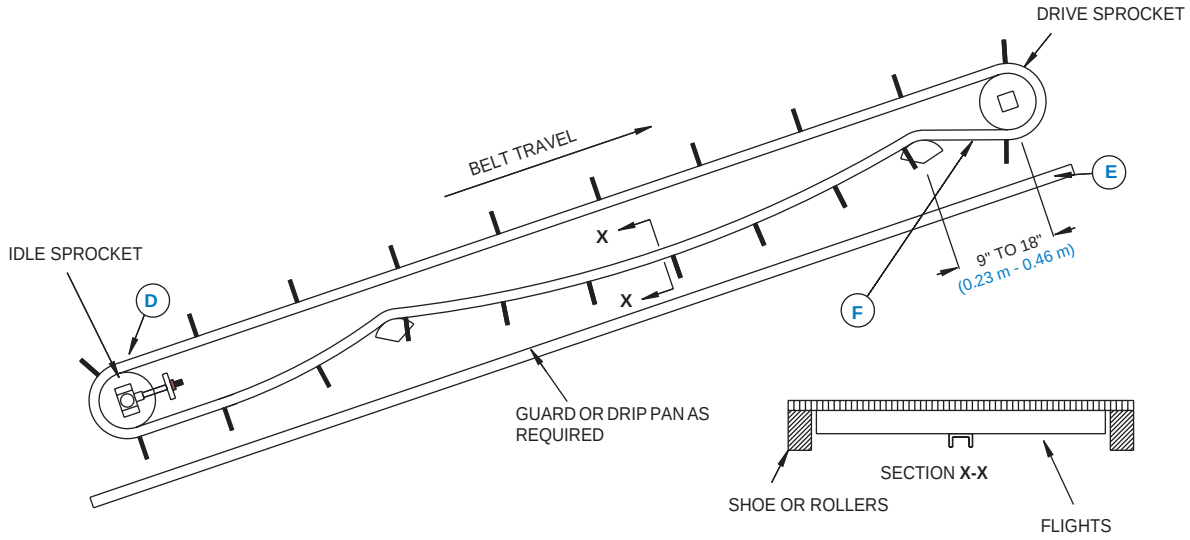


FIG. 3-16 INCLINE CONVEYOR

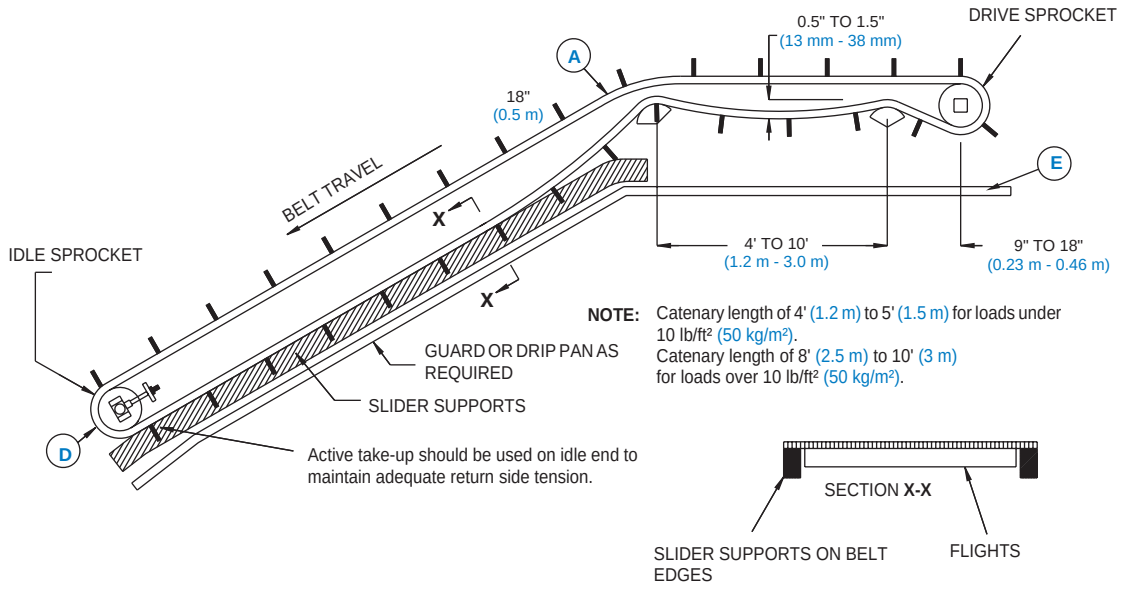


FIG. 3-17 DECLINE CONVEYOR

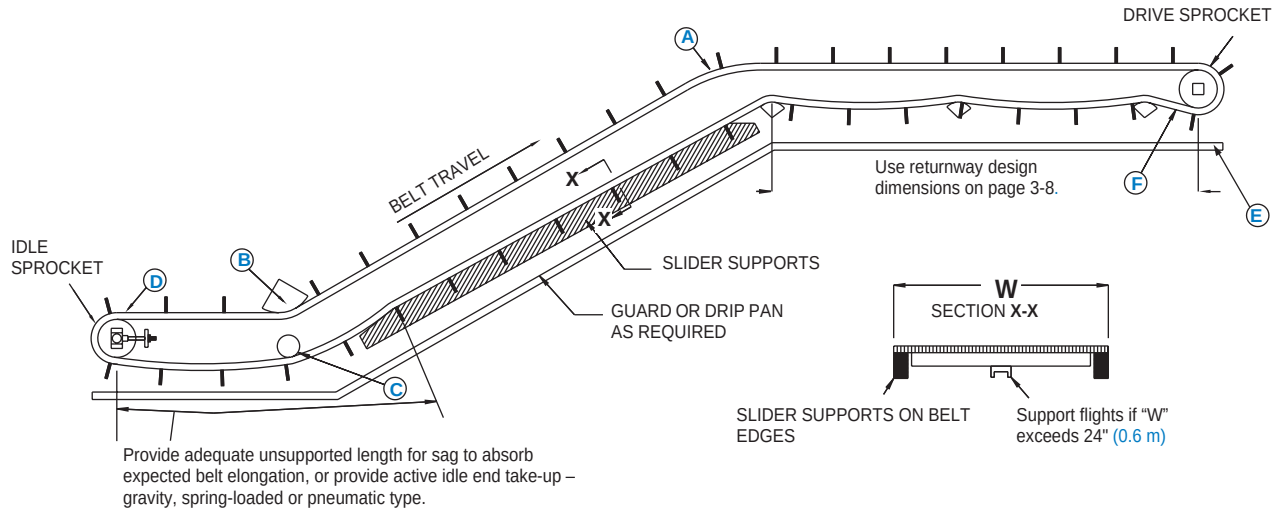


FIG. 3-18 ELEVATING CONVEYOR WITH BELT EDGE SLIDER RETURN

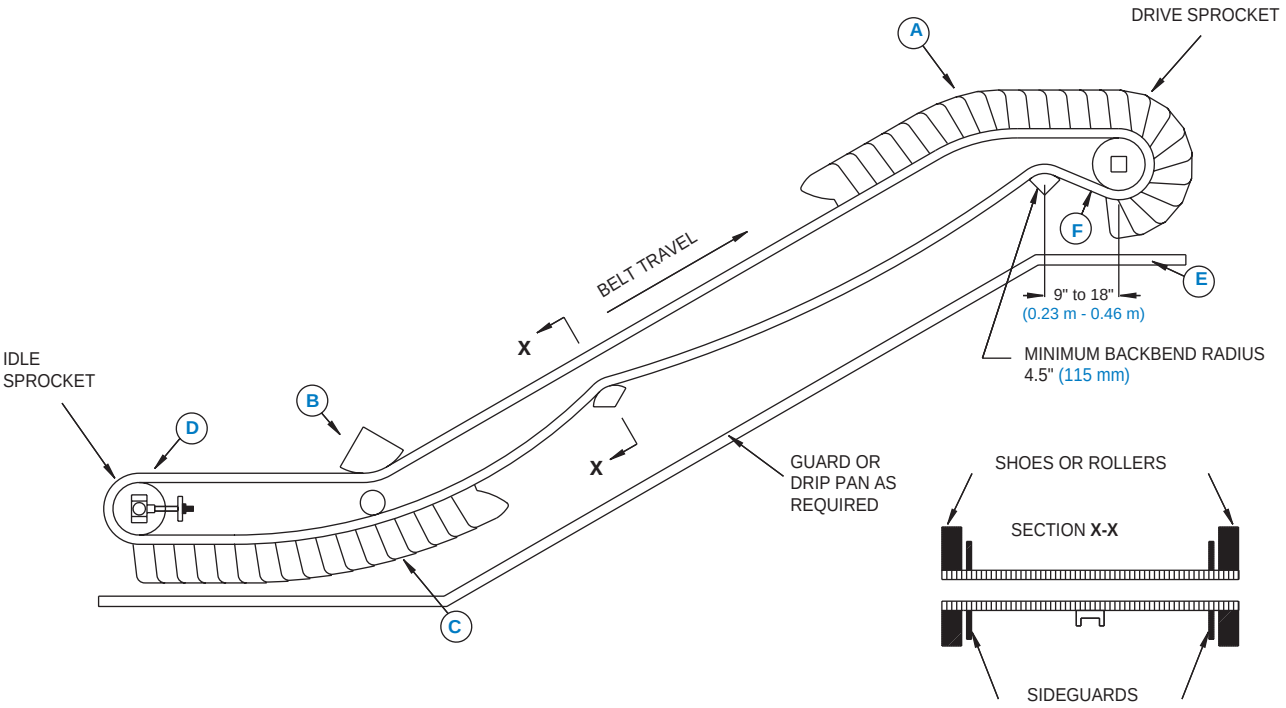


FIG. 3-19 ELEVATING CONVEYOR WITH WIDE SIDEGUARDS AND SHOE RETURN

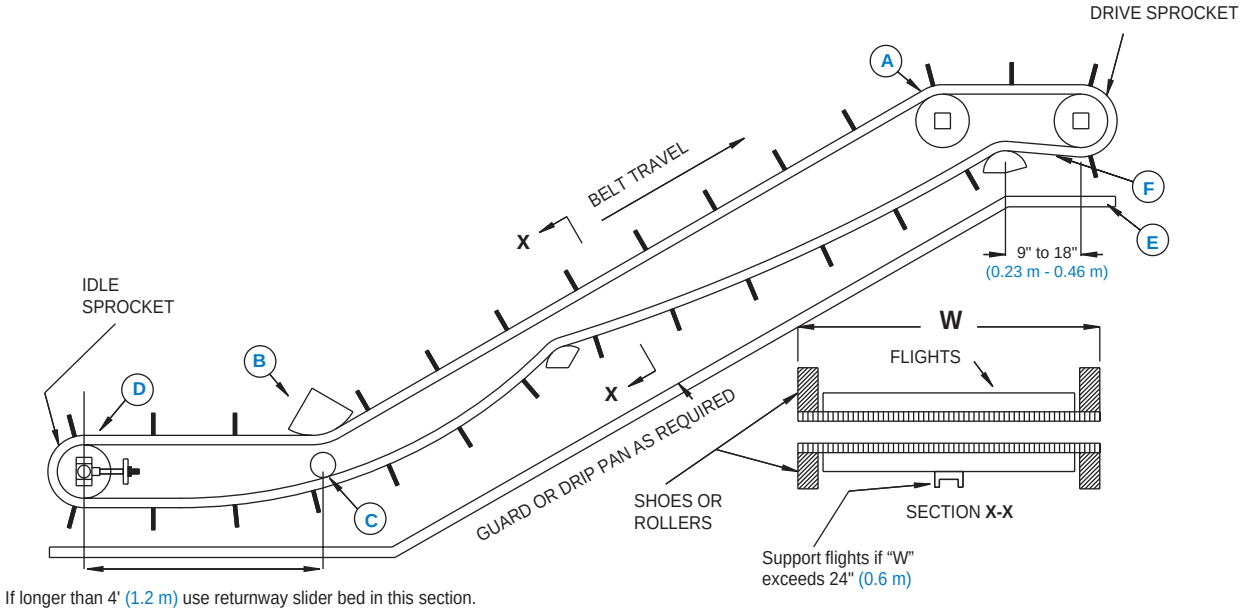


FIG. 3-20 ELEVATING CONVEYOR WITH SHOE RETURN

Hold down rollers

Some elevating conveyors can employ Hold Down Roller assemblies in place of hold down shoes or rollers. These roller assemblies ride in steel rails on the carryway and returnway side of the conveyor. To minimize wear, the rail bend radius should be as large as the application allows. The minimum bend radius should be 12 in. (305 mm). The minimum rail thickness should be 0.125 in. (3.2 mm), and should be at least 0.75 in. (19 mm) wide. The minimum bend radius is proportional to the thickness of the carryway rail. A thicker rail will require a larger bend radius. Normally, the roller assemblies are spaced every fourth row along the length of the belt. The tightest spacing possible is every second row. Assembly spacing has no effect on bend radius.

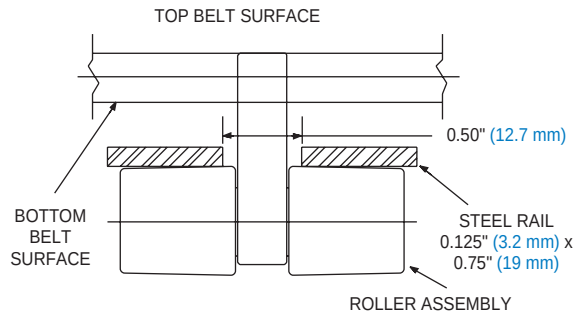


FIG. 3-21 HOLD DOWN ROLLER

When large temperature variations are to be encountered, care must be taken in the placement of the rails to accommodate the thermal expansion of the belt. The transverse movement of the roller assemblies can be calculated by using the **Coefficients of Thermal Expansion** on page 3-19. The distance of the hold down roller assembly to the belt centerline is used to calculate the movement.

For example:

A 24 in. (610 mm) **Series 400 Flush Grid** polypropylene belt, with hold down rollers indented 4 in. (102 mm) from each side, will operate at 100 °F (38 °C). The distance at ambient temperature, 70 °F (21 °C), from a hold down roller assembly to the belt centerline is 8 in. (203 mm).

$$\Delta = L_1 \times (T_2 - T_1) \times e$$
$$\Delta = 8 \text{ in.} \times (100 \text{ °F} - 70 \text{ °F}) \times 0.0008 \text{ in/ft/°F} \times \frac{1 \text{ ft.}}{12 \text{ in.}}$$
$$\Delta = 0.016 \text{ in. } (0.41 \text{ mm})$$

where

- L_1 = distance from hold down roller to belt centerline
- T_1 = ambient temperature
- T_2 = operating temperature
- e = thermal expansion coefficient (0.0008 in/ft/°F for polypropylene)

Each hold down roller assembly will move 0.016 in. (0.41 mm) when the belt is raised to operating temperature.

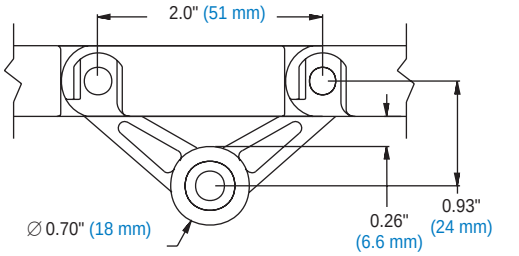


FIG. 3-22A HOLD DOWN ROLLER, SIDE VIEW

FIG. 3-22B LINEAR SPACING OF HOLD DOWN ROLLERS

Friction modules

Two Intralox belt styles, the **Series 900 Friction Top**, and **Series 2200 Flush Grid** incorporate a high friction material to move products (cartons, trays, bags, etc.) on inclines.

• Integral friction surface modules

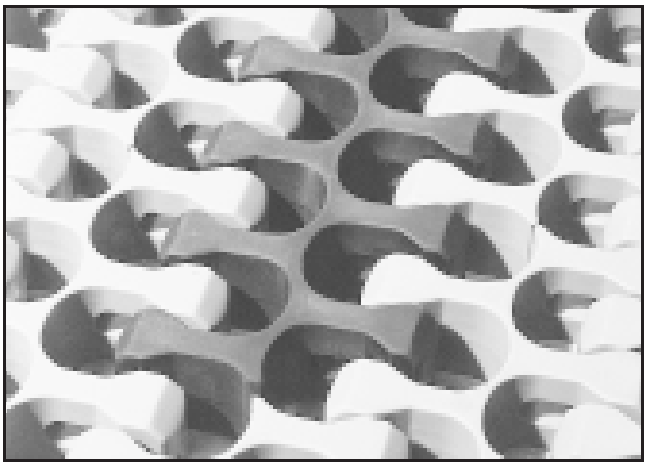
The high friction rubber of **Series 900 Friction Top** modules is MOULDED to a polypropylene or polyethylene base. Normal wearstrip, carryway and sprocket recommendations apply.

• Independent modules

High friction modules for **Series 2200** are made completely from thermoplastic rubber (TPR). The surface of these modules is 0.06 in. (1.5 mm) above the main surface of the belt. This insures that the product being conveyed is in full contact with the friction modules. The bottom of the friction modules is raised 0.08 in. (2 mm) from the bottom surface of the belt to prevent the inserts from coming in contact with the carryway or wearstrips.

Series 2200 friction modules have little tensile strength. Therefore, the strength of straight running belts must be down-rated based on the amount of rubber in the belt. To obtain the down-rated belt strength, multiply the straight running belt strength of the base material by the difference between total belt width and the combined width of the friction modules. For example, a 12 in. (305 mm) wide polypropylene belt with 6 in. (152 mm) of friction modules across the belt would be down-rated to 700 lb (318 kg). Sideflexing belts with an indent of at least 3.5 in. (89 mm) do

not lose strength, thus need not be down-rated. When the indent is less than 3.5 in. (89 mm), belt strength will be reduced.



SERIES 2200 BELT WITH HIGH FRICTION MODULE

Conveyor design issues for friction modules

The following guidelines apply:

- The returnway must be designed to eliminate rubbing contact with friction modules. When using return rollers, the minimum roller diameter should be 3 in. (76 mm). Refer to **Elevating Conveyors** on page 3-12 for detailed returnway information.
- The friction between the product and the belt is deliberately very high. Flow pressures and belt pulls will be high in applications where the product is allowed to back up. These situations are not recommended for **Series 900 Friction Tops** or **Series 2200** with friction modules.
- End-to-end transfers at both the in-feed and discharge ends are recommended. Sliding side transfers are ineffective due to the high friction quality of the friction modules.
- Thermal expansion is controlled by the base material.
- Operating temperature limits are controlled by the base material.

SIDEFLEXING CONVEYORS

Series 2000, Series 2200 and **Series 2400** are designed for sideflexing applications that have a turning radius of 2.2 (measured from the inside edge of the belt). Sideflexing systems have many more design considerations than straight running systems. Some of these are discussed in Section Two, **Product Line**. The data pages for **Series 2000, Series 2200** and **Series 2400** list requirements for both calculating the belt loads on a side-flexing system and basic design requirements for each belt. More detailed information is contained in the following literature available from Customer Service:

Radius Belt Design Guidelines and Installation Instructions INTRAFLEX TM 2000, SERIES 2200, AND SERIES 2400

TIGHT TRANSFER METHODS FOR SERIES 1100

Series 1100 has two small steel sprockets for very tight end-to-end transfers. The 1.6 in. (40 mm) and 2.3 in. (59 mm) pitch diameter sprockets both offer positive drive and tracking of the belt, and allow use of very small transfer plates. When even tighter transfers are desired, nosebars or rollers may be used. The smallest nosebar diameter recommended for **Series 1100** is 0.75 in. (19 mm). Dead plates can be as small as 1 in. (25.4 mm) wide.

Arrangements which allow the nosebars to rotate freely are preferred. Belt tension increases dramatically as it slides around stationary nosebars. The increased belt pull is a function of the friction between the sliding belt and the stationary nosebar, and the angle of wrap between the belt and the nosebar.

The nosebar material should be selected to result in the lowest possible sliding friction between the belt and nosebar. Lower friction will reduce belt tension. The amount of belt wrap around the nosebar also affects belt tension. There should be as little wrap as possible. Figure 3-25 shows a common nosebar configuration.

More comprehensive information on nosebars is available in the Mass Can Handling Design Guidelines. Contact Intralox Customer Service to obtain a copy.

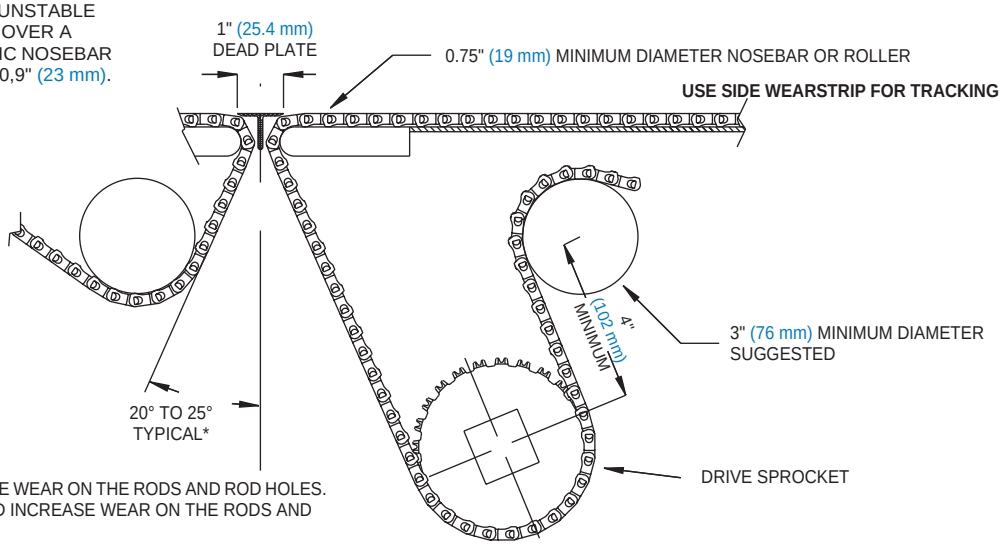


FIG. 3-23 SERIES 1100 NOSEBAR CONFIGURATION — END DRIVE

TRANSFER DESIGN GUIDELINES

END-OFF/END-ON TRANSFERS

Finger transfer plates

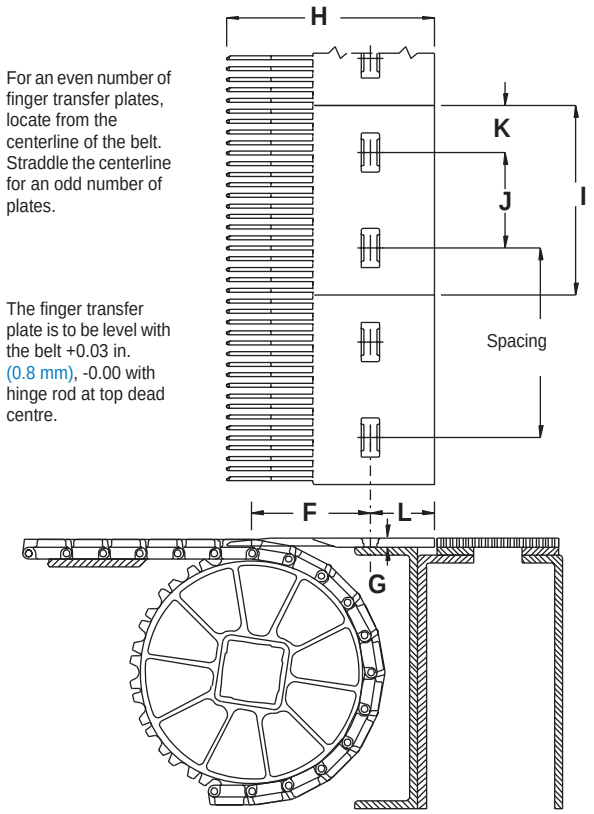
Intralox Raised Rib belts and matching finger transfer plates are a highly efficient, low maintenance transfer system currently used in many container handling applications.

Correct installation of finger transfer plates is essential for trouble free service and long belt life. Proper installation is particularly important in areas where belting is subjected to high temperature variations and significant thermal expansion.

DIMENSIONAL REQUIREMENTS FOR FINGER TRANSFER PLATE INSTALLATION in. (mm)

	SERIES 100		SERIES 400*		SERIES 900 6" (152 mm)		SERIES 900 4" (102 mm) retrofit**	SERIES 2000	
F	2.38 (61)		3.50 (89)		3.50 (89)		2.38 (61)	3.50 (89)	
G	0.19 (5)		0.31 (8)		0.25 (6)		0.19 (5)	0.25 (6)	
H	5.83 (148)		7.50 (191)		6.50 (165)		5.83 (148)	6.50 (165)	
I	3.96 (101)		5.92 (150)		5.92 (150)		3.94 (100)	5.92 (150)	
J	2.50 (64)		3.00 (76)		3.00 (76)		2.18 (55)	3.00 (76)	
K	0.74 (19)		1.45 (37)		1.45 (37)		0.90 (23)	1.45 (37)	
L	2.00 (51)		2.00 (51)		2.00 (51)		2.00 (51)	2.00 (51)	
SPACING AT AMBIENT	Polypropylene	Acetal	Polypropylene	Polyethylene	Polypropylene	Acetal	Acetal	Polypropylene	Acetal
	3.979 (101.1)	3.976 (101.0)	5.946 (151.0)	5.946 (151.0)	5.981 (151.9)	5.975 (151.8)	3.976 (101.l0)	5.990 (152.2)	5.975 (151.8)

* Dimensions are for single material, Series 400 Finger Transfer Plates only. See page 2-30 for information on Series 400 Two-Material Finger Transfer Plate dimensions.
** See page 2-54 for more information.



For an even number of finger transfer plates, locate from the centerline of the belt. Straddle the centerline for an odd number of plates.

The finger transfer plate is to be level with the belt +0.03 in. (0.8 mm), -0.00 with hinge rod at top dead centre.

FIG. 3-24 FINGER TRANSFER PLATES DIMENSIONAL REQUIREMENTS

The metal plate support angle used to secure the finger transfer plates to the conveyor frame should be drilled and tapped for 1/4 – 20 screws (metric size M6). *Accurate drilling and tapping are important!* Finger transfer plates are MOULDED with slots for Intralox shoulder bolts. These bolts prevent the plate from being clamped too tightly to the support angle. The loose fit allows the plates to move laterally and remain properly engaged with the belt's ribs during expansion or contraction caused by changes in temperature. The length of the slots in the finger transfer plates limits the amount of expansion and contraction that can be accommodated. It is possible that very wide belts undergoing large temperature variations will exceed the expansion or contraction limits. Contact Intralox Sales Engineering if the values shown in the accompanying table are not large enough for your application.

MAXIMUM BELT WIDTH x TEMPERATURE inches x °F (mm x °C)

BELT MATERIAL	SERIES 100	SERIES 400	SERIES 900	SERIES 2000
Polypropylene	3750 (52,900)	15,000 (211,700)	7500 (105,800)	7500 (105,800)
Polyethylene	2000 (28,200)	8000 (112,900)	4000 (56,400)	4000 (56,400)
Acetal	5000 (70,600)	--	10,000 (141,000)	10,000 (141,000)

TEMPERATURE EFFECTS:

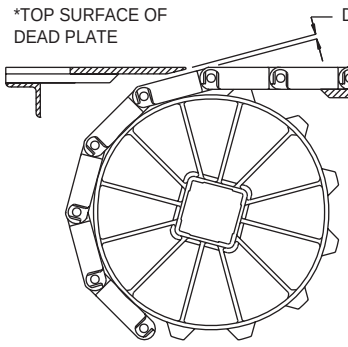
As temperature varies, the width of the belt changes in proportion to the magnitude of the temperature change. To insure proper finger transfer plate operation, perform the following check:

1. Determine the maximum expected change in temperature from ambient, in °F (°C).
2. Multiply the maximum temperature change by the belt width, in inches (millimetres).
3. If the calculated value is greater than the value obtained from the chart below, contact Intralox Sales Engineering before proceeding.

Dead plates

Where there is a transfer point from a belt without finger transfer plates to a dead plate, there should be a gap between the surfaces to allow for the chordal action of the belt. As the belt engages its sprockets, chordal action causes the modules to move past a *fixed* point (the tip of the dead plate) with *varying* clearances. The table below shows the minimum amount of gap which occurs at the "low point" of the modules if the tip of the dead plate just comes in contact with the "high point" as the modules pass.

In some installations it may be desirable to keep the tip of the dead plate in contact with the belt, rather than allow a gap to occur. This can be done by hinging the mounting bracket for the dead plate. This allows the dead plate to move as the modules pass, but results in a small oscillating motion which may present tippage problems for sensitive containers or products.



*NOTE:
The top surface of the dead plate is typically 0.031 in. (0.8 mm) above the belt surface for product transfer onto the belt, and 0.031 in. (0.8 mm) below the belt surface for product transfer off the belt.

FIG. 3-25 DEAD PLATE GAP

DEAD PLATE GAP			
SPROCKET DESCRIPTION		GAP	
PITCH DIAMETER	NO. OF TEETH	in.	mm
SERIES 100			
2.0 in. (51 mm)	6	0.134	3.4
3,5 in. (89 mm)	11	0.073	1.9
6.1 in. (155 mm)	19	0.041	1.0
SERIES 200			
4.0 in. (102 mm)	6	0.268	6.8
6.4 in. (163 mm)	10	0.160	4.1
10.1 in. (257 mm)	16	0.100	2.5
SERIES 400			
4.0 in. (102 mm)	6	0.268	6.8
5.2 in. (132 mm)	8	0.200	5.1
5.8 in. (147 mm)	9 (Flush Grid Acetal)	0.178	4.5
6.4 in. (163 mm)	10	0.160	4.1
7.8 in. (198 mm)	12	0.130	3.3
8.4 in. (213 mm)	13 (Flush Grid Acetal)	0.121	3.1
10.1 in. (257 mm)	16	0.100	2.5
SERIES 800			
4.0 in. (102 mm)	6	0.268	6.8
5.2 in. (132 mm)	8	0.200	5.1
6.5 in. (165 mm)	10	0.158	4.0

DEAD PLATE GAP (Continued)			
SPROCKET DESCRIPTION		GAP	
PITCH DIAMETER	NO. OF TEETH	in.	mm
7.7 in. (196 mm)	12	0.132	3.4
10.3 in. (262 mm)	16	0.098	2.5
SERIES 900			
2.1 in. (53 mm)	6	0.147	3.7
3.1 in. (79 mm)	8	0.095	2.4
3.5 in. (89 mm)	10	0.084	2.1
4.1 in. (104 mm)	12	0.071	1.8
5.1 in. (130 mm)	15	0.057	1.4
5.8 in. (147 mm)	17	0.050	1.3
6.1 in. (155 mm)	18	0.047	1.2
6.8 in. (173 mm)	20	0.042	1.1
9.8 in. (249 mm)	28	0.029	0.7
SERIES 1100			
1.6 in. (41 mm)	8	0.058	1.5
2.3 in. (58 mm)	12	0.040	1.0
3.1 in. (79 mm)	16	0.029	0.7
3.5 in. (89 mm)	18	0.026	0.7
3.8 in. (97 mm)	20	0.024	0.6
4.6 in. (117 mm)	24	0.020	0.5
5.1 in. (130 mm)	26	0.018	0.4
6.1 in. (155 mm)	32	0.015	0.4
SERIES 1400			
5.7 in. (145 mm)	18	0.044	1.1
5.7 in. (145 mm)	18	0.044	1.1
6.7 in. (170 mm)	21	0.038	1.0
SERIES 1800			
8.1 in. (206 mm)	10	0.091	2.8
5.0 in. (127 mm)	6	0.108	3.8
6.5 in. (165 mm)	8	0.150	2.3
10.5 in. (267 mm)	13	0.074	1.9
SERIES 2000			
6.5 in. (165 mm)	16	0.061	1.5
8.1 in. (206 mm)	20	0.049	1.2
SERIES 2200			
3.9 in. (99 mm)	8	0.150	3.6
5.3 in. (135 mm)	11	0.108	2.8
6.3 in. (160 mm)	13	0.091	2.3
7.7 in. (196 mm)	16	0.074	1.9
SERIES 2400			
5.1 in. (130 mm)	16	0.050	1.7
2.0 in. (51 mm)	6	0.065	3.4
3.9 in. (99 mm)	12	0.134	1.3
6.4 in. (163 mm)	20	0.039	1.0
SERIES 3000			
7.7 in. (196 mm)	12	0.132	4.0
5.2 in. (132 mm)	8	0.158	5.1
6.5 in. (165 mm)	10	0.200	3.4
SERIES 4000			
6.7 in. (170 mm)	21	0.038	1.1
5.1 in. (130 mm)	16	0.044	1.3
5.7 in. (145 mm)	18	0.050	1.0

90° CONTAINER TRANSFERS

When transferring containers on beverage lines from one conveyor to another at a 90° angle, it is common practice to use full radius guide rails with dead plates which span the space between the delivery and the takeaway conveyors. Containers moving along the full radius guide rail exert high pressure on the rail (Figure 3-27), and on each other, often resulting in container damage. Pressure forces peak to the end of the outer curve as the containers move onto the dead plate.

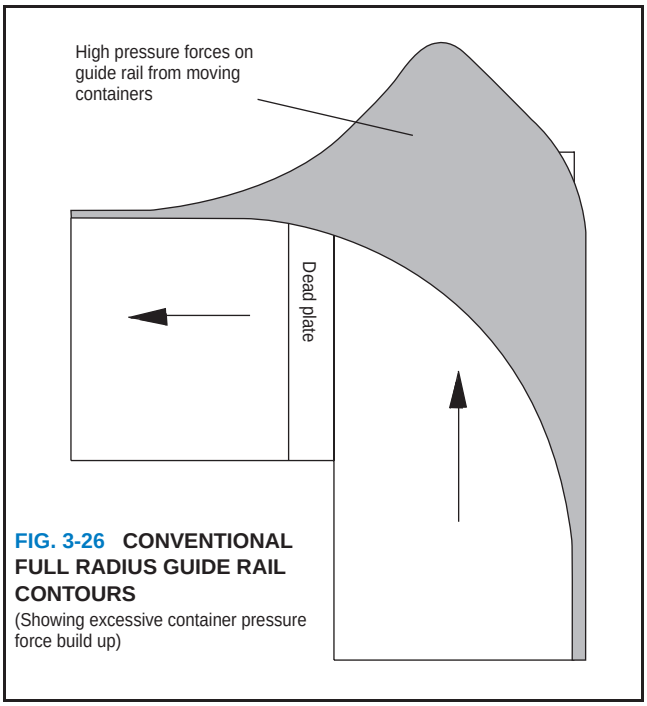


FIG. 3-26 CONVENTIONAL FULL RADIUS GUIDE RAIL CONTOURS
(Showing excessive container pressure force build up)

Parabolic guide rails

The **parabolic guide rail** was designed by a beverage industry engineer for better distribution of the container pressure forces along the outer guide rail. Figure 3-28 shows that the forces are more evenly distributed. This results in significantly less potential for container damage along the outer rail. However, an excessively large dead area, which strands containers, arises along the *inner* parabolic guide rail contour.

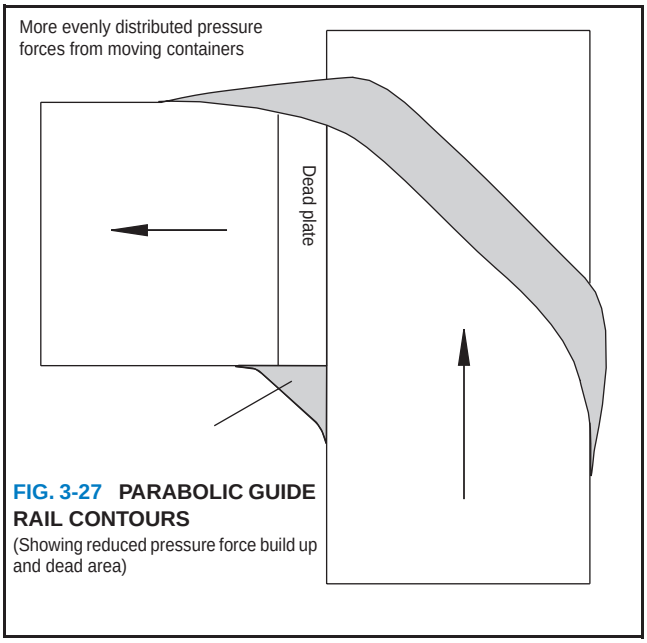


FIG. 3-27 PARABOLIC GUIDE RAIL CONTOURS
(Showing reduced pressure force build up and dead area)

Series 900 and Series 1400 ONEPIECE™ Live Transfer belt

A solution to the dead area problem incorporates a **Series 900** or **Series 1400 ONEPIECE™** Live Transfer Belt, either slaved to the delivery conveyor or independently driven. Figure 3-29 shows a 6.0 in. (152 mm) transfer belt running parallel to, and in the same direction as, the delivery conveyor. This eliminates the dead area along the inner parabolic guide rail, as well as the dead plate itself, enabling continuous container movement and eliminating stranded containers through the turn.

See the Product Line section, pages 2-44 and 2-48, for more information on the **Series 900 ONEPIECE™** Live Transfer Belts and page 2-63 for more information on the **Series 1400 ONEPIECE™** Live Transfer Belt.

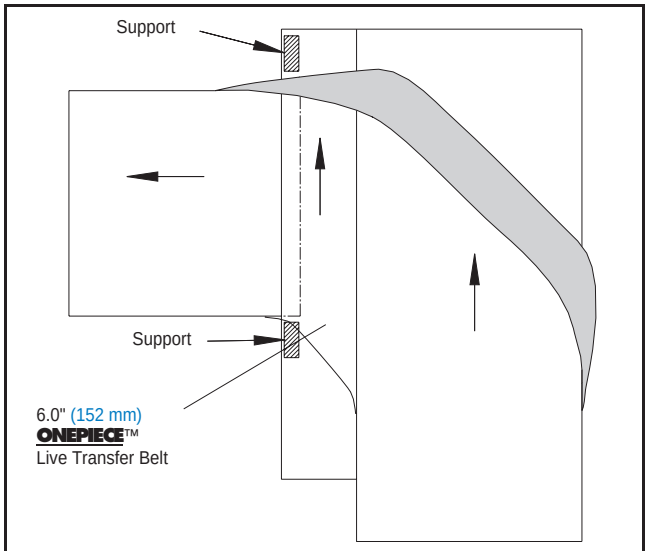


FIG. 3-28 PARABOLIC GUIDE RAIL CONTOURS WITH 6.0 in. (152 mm) ONEPIECE™ LIVE TRANSFER BELT

VACUUM TRANSFER APPLICATIONS

Series 900 and **Series 1100 Perforated Flat Top** belts are often used to invert empty containers which are held against the belt by a vacuum created on the opposite side of the conveyor. As the containers are carried around large diameter drums to the returnway side of the conveyor, they are inverted, then discharged from the belt.

The differential pressure acting to hold the containers to the belt, also acts to hold the belt to the carryway. Thus, an *additional belt pull* is introduced. On small belts with low differential pressures, this added pull may be low and insignificant. On large belts with high differential pressures, the additional pull may be quite high. Under average conditions, the **SPECIFIC ADDED BELT PULL** should not exceed 1.25 lb/ft² (0.24 kg/m²) per inch (mm) water column, vacuum.

The designer also may be interested in the amount of air flow through the belt at various differential pressures. Air flow depends on the amount of open area, the differential pressure, the container spacing on the belt, and the air leakage around the perimeter of the belt. For air flow information on different belt series and styles, refer to **Table 9** on page 4-13.

SPECIAL DESIGN GUIDELINES

THERMAL EXPANSION AND CONTRACTION

With few exceptions, the dimensions of all substances increase as their temperature is increased and contract as their temperature is decreased. Since plastics expand and contract rather significantly, this must be considered in the conveyor design whenever operating temperatures differ from ambient temperature.

The designer must allow for changes in both belt length and width to accommodate expansion or contraction. An adequate unsupported span in the returnway must be provided to absorb the increase in belt length. There must be sufficient side clearance, particularly on wide belts, to prevent interference with the side structure. In low temperature applications, the frame must support the belt fully in its cold condition, yet not interfere at ambient temperatures.

Changes in the dimensions of a belt are determined in this manner:

$$\Delta = L_1 \times (T_2 - T_1) \times e$$

where: Δ = change in dimension, in. (mm)
L, W = total belt length/width at initial temperature, ft. (m)
$\mathbf{T_2}$ = operating temperature, °F (°C)
$\mathbf{T_1}$ = initial temperature, °F (°C)
e = Coefficient of Thermal Expansion, in/ft/°F (mm/m/°C)

Example:

The ambient temperature is 70 °F (21 °C). The operating temperature is 180 °F (82 °C). What is the greatest increase in belt length and width of a 60 ft. (18.3 m) long by 10 ft. (3 m) wide polypropylene belt while in operation?

$$\mathbf{L} = 60 \times (180 - 70) \times 0.0008$$
$$\Delta = 5.28 \text{ in. } (134 \text{ mm})$$

This belt will increase in length by 5.28 in. (134 mm), *not an insignificant amount*. Its width will expand by:

$$\mathbf{W} = 10 \times (180 - 70) \times 0.0008$$
$$\Delta = 0.88 \text{ in. } (22 \text{ mm})$$

Therefore, this belt would need a method by which approximately 5.5 in. (140 mm) of increased belt length could be absorbed on the return side of the conveyor. The width of the conveyor frame would need to be approximately 1 in. (25 mm) wider than its corresponding design under ambient conditions.

EXPANSION DUE TO WATER ABSORPTION

If nylon belts are used in continuously wet, elevated temperature environments, they have a tendency to absorb water and expand both in length and width. If an application requires a nylon belt in these conditions, contact Intralox Sales Engineering to determine the approximate expansion due to water absorption of the belt.

"SLIP-STICK" EFFECT

Surging on long conveyors can be caused by a condition known as "slip-stick". In this situation, the belt acts like a large spring or rubber band. When this occurs, the belt will make relatively short, pulsed movements throughout the length of the conveyor. The idle end of the belt may not move until there is enough belt tension to overcome the friction forces between the belt and the carryway. Instead of accelerating smoothly, the belt surges ahead. This in turn causes a brief drop in belt tension, allowing the belt to be slowed by friction. In some instances, the belt will even stop for a moment until the tension develops again. Then the process repeats itself. The idle end of the conveyor surges despite the constant speed of rotation of the sprockets at the drive end.

Carryway friction, belt stiffness, belt weight and length play a large role in determining the severity of surging in a conveyor. Stiffness is a reflection of how far a belt will stretch under a given tension. A stiffer belt will develop belt tension with less elongation. A lighter weight belt will not have as much friction force to overcome.

Other factors that can effect surging are chordal action, belt speed, drive system pulsation, return roller diameter and return roller spacing. Chordal action and drive system pulsation can initiate surging. However, return roller diameter and spacing are more critical. Return rollers influence the way in which the belt in the returnway oscillates. Oscillation in the returnway can be transmitted to the carryway side of the belt, causing surging. For more information on roller spacing and diameter, see pages 3-7 and 3-8. Chordal action information is presented in Section One, **Intralox System**.

COEFFICIENTS OF THERMAL EXPANSION

MATERIALS	in/ft/°F	(mm/m/°C)
BELTS		
ACETAL, EC ACETAL	0.0006	(0.09)
POLYETHYLENE		
Series 100 Belts	0.0015	(0.23)
Series 400 Raised Rib Belts	0.0015	(0.23)
All Other Belts	0.0011	(0.17)
POLYPROPYLENE		
(less than 100 °F [38 °C])	0.0008	(0.12)
POLYPROPYLENE		
(greater than 100 °F [38 °C])	0.0010	(0.15)
NYLON (HR, IR, AR)	0.0005	(0.07)
FLAME RETARDANT	0.0008	(0.12)
WEARSTRIPS		
HDPE and UHMW PE		
-100 °F to 86 °F (-73 °C to 30 °C)	0.0009	(0.14)
86 °F to 210 °F (30 °C to 99 °C)	0.0012	(0.18)
NYLATRON	0.0004	(0.06)
TEFLON	0.0008	(0.12)
METALS		
ALUMINUM	0.00014	(0.02)
STEEL (Carbon and Stainless)	0.00007	(0.01)

TABLE OF CONTENTS

Page #

SYMBOLS USED 4-1
FORMULAS 4-2
SAMPLE PROBLEMS 4-5
TABLES 4-9
- Belt Weight 4-9
- Coefficient of Friction 4-9
- Belt Strength 4-10
- Sprocket and Support Quantity Reference ... 4-11
- Service Factor 4-11
- Temperature Factors 4-12
- Shaft Data 4-13
- Maximum Recommended Torque on Drive Shaft 4-13
- Air Flow Rates 4-13
- Maximum Drive Shaft Span Length 4-14
- Maximum Idle Shaft Span Length 4-14
- Measurement Conversion Factors 4-15
- Chemical Resistance 4-16

Section Four provides the appropriate formulas and tables needed to calculate the values for selecting the proper belt for any application. This section also provides measurement conversion factors for all the units used in the formulas and tables. A Chemical Resistance Table is provided to determine if the desired belt material will be chemically compatible for the application.

SYMBOLS USED

		UNITS OF MEASURE ENGLISH (USA) SYSTEM	UNITS OF MEASURE METRIC (SI) SYSTEM
BS	Belt Strength Rated [70 °F (21 °C)]	lb/ft of width	kg/m of width
ABS	Allowable Belt Strength at Operating Conditions	lb/ft of width	kg/m of width
BP	Belt Pull at Drive Sprocket	lb/ft of width	kg/m of width
ABP	Adjusted Belt Pull	lb/ft of width	kg/m of width
M	Product Loading on Belt	lb/ft²	kg/m²
M_p	Backed-up Product Load	lb/ft²	kg/m²
W	Weight of Belt	lb/ft²	kg/m²
CL	Centerline	—	—
L	Length of Conveyor, Shaft CL to Shaft CL	ft.	m
H	Elevation Change of Conveyor	ft.	m
F	Total Friction Factor	—	—
F_w	Friction Coefficient, Wearstrip to Belt	—	—
F_p	Friction Coefficient, Product to Belt	—	—
SF	Service Factor	—	—
B	Width of Belt	ft.	m
Q	Weight of Shaft	lb/ft	kg/m
w	Total Load on Shaft	lb	kg
L_s	Length of Shaft, between Bearings	in.	mm
T_o	Torque on Drive Shaft	in-lb	kg-mm
PD	Pitch Diameter of Sprockets	in.	mm
V	Speed of Belt Travel	ft/min	m/min
°F	Degrees, Fahrenheit	°F	—
°C	Degrees, Celsius	—	°C
T	Temperature Factor	—	—
S	Strength Factor	—	—
HP	Horsepower	hp	—
P_w	Power, Watts	—	Watts
E	Modulus of Elasticity (Young's Modulus)	lb/in²	kg/mm²
I	Moment of Inertia	in^4	mm4
D	Deflection of Shaft	in.	mm
n	Shaft Speed of Rotation	rpm	rpm
Ø	Diameter	in.	mm

FORMULAS

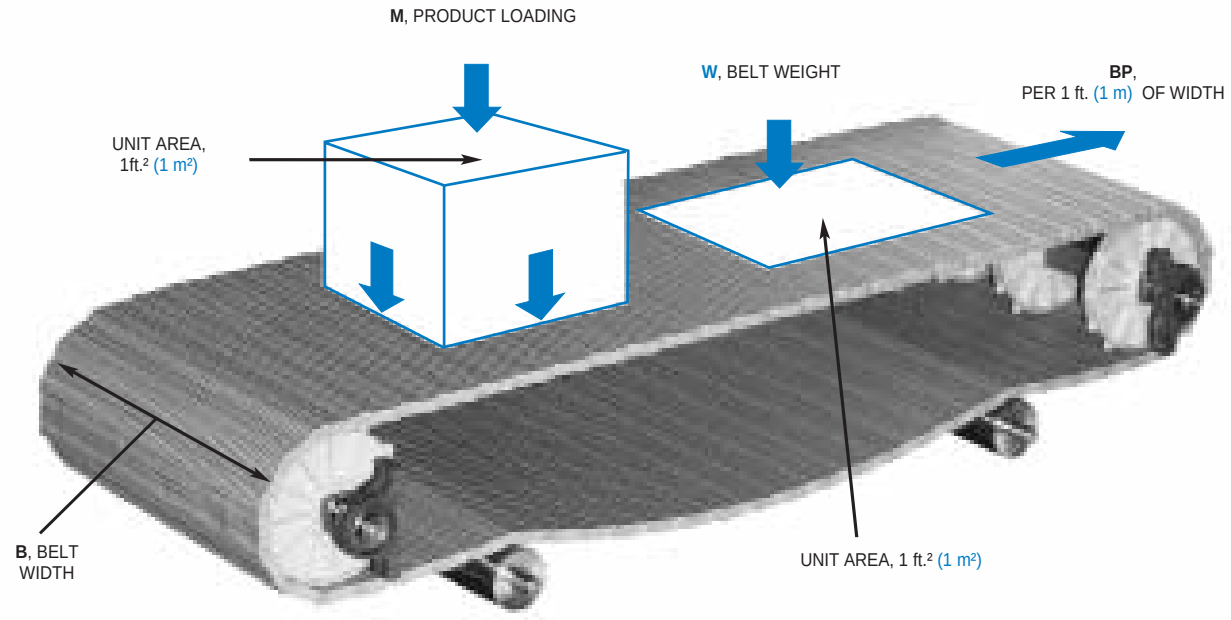


FIG. 4-1 PRIMARY LOADS — CONVENTIONAL CONVEYOR

CALCULATING BELT PULL OR TENSION LOAD

The tensile strength on an operating conveyor belt is produced by the combination of loads imposed by frictional resistance and by moving the product to a different elevation, should that be involved.

Frictional forces are developed in two ways. First, the weights of the belt and the product being conveyed bearing on the carryway create a resistance as the belt is driven. Second, if the product is held stationary while the belt continues to move under it, there is an added resistance between the belt and the product.

Each of these frictional forces is proportional to a **COEFFICIENT OF FRICTION**, which is dependent upon the materials in question, their surface qualities, the presence (or absence) of a lubricant, the cleanliness of the surfaces and other factors. Typical values of Coefficients of Friction for common conveying applications using Intralox belts are shown in **Tables 2A** and **2-B** on page 4-9. The Coefficient of Friction between the belt and the carryway wearstrips is designated as F_w. The coefficient between the product being moved and the belt is represented as F_p.

The first step in calculating **BELT PULL, BP,** is calculation of the **BACKED-UP PRODUCT LOAD, M_p**:

FORMULA 1 **(BACKED-UP PRODUCT LOAD)**
$M_P = M \times F_P \times \left(\frac{\text{Percentage of Belt Area Backed-Up}}{100}\right)$
NOTE: If there is no slippage of product on the belt, nor "backed-up" product, ignore M_p, since it does not apply.

Notice that in **Table 2-A** there are dual listings of F_w for belts made of polypropylene, one for clean, smooth running applications and another for "abrasive" applications.

In this case, "abrasives" are defined as small amounts or low levels of fine grit, dirt, fiber or glass particles present on the carryway. The designer should be aware that many factors affect friction. Slight variations in conditions can produce wide deviations. Accordingly, when using friction coefficients in design calculations, allow for these variations.

After calculating M_p and finding the friction factor F_w, calculate the **BELT PULL, BP**, using this formula:

FORMULA 2 **(BELT PULL)**
$BP = [(M + 2W) \times Fw + M_p] \times L + (M \times H)$

This equation for Belt Pull reflects its two components: **$[(M + 2W) \times Fw + M_p] \times L$** for the friction load and **$(M \times H)$** for the change in elevation, if one exists.

ADJUSTING THE CALCULATED BELT PULL FOR ACTUAL SERVICE CONDITIONS

Service conditions may vary greatly. The **Belt Pull, BP**, calculated from **Formula 2** should be adjusted to allow for those factors. The **ADJUSTED BELT PULL, ABP**, is determined by applying an appropriate **Service Factor**, **SF**, using this formula:

FORMULA 3 **(ADJUSTED BELT PULL)**
$ABP = BP \times SF$

Service Factors can be determined using **Table 5** on page 4-11.

CALCULATE ALLOWABLE BELT STRENGTH, ABS

Intralox belts have strength ratings, determined at ambient temperature and low speed. Because the strength of plastics generally decreases as their temperature increases, and because the wear rate is directly proportional to speed but

inversely proportional to conveyor length, the **RATED BELT STRENGTH**, **BS**, should be adjusted according to this formula:

FORMULA 4 **(ALLOWABLE BELT STRENGTH)**
ABS = BS x T x S

The *rated* **BELT STRENGTH**, **BS**, and **TEMPERATURE AND STRENGTH FACTORS**, **T** and **S**, may be found on the various **Product Line** pages. **T** and **S** can also be found in **Tables 3** and **6** on pages 4-10 and 4-11. If a **CENTER DRIVE** is used, determine **S** by using the following equation:

for S greater than 0.6 **S'** = 1-2 (1-**S**)

for S less than 0.6 **S'** = 0.2

then, **ABS** = BS x T x S'

DETERMINE THE MAXIMUM SPACING OF DRIVE SHAFT SPROCKETS AND RECOMMENDED MINIMUM NUMBER OF SHAFT SPROCKETS

With the **ADJUSTED BELT PULL**, calculated from **Formula 3**, refer to the sprocket sections on the appropriate **Product Line** pages, to determine the *maximum spacing of sprockets on the drive shaft*.

The *number of drive sprockets* required for a conveyor equals the *number of spaces, plus one*.

For example, if a **Series 100** belt is to be 65 inches wide, and the **ADJUSTED BELT PULL** is 200 pounds per foot of belt width, what is the maximum spacing and how many drive sprockets are required?

From page 2-11, the *maximum* spacing is shown as *4 inches*. The number of *spaces* is 65/4 or 16.25, or rounded to the next whole number to 17. Therefore, the number of drive sprockets required is 17 + 1 or 18, which will give an actual spacing of 3.82 inches.

Idle Shaft sprockets *on conventional conveyors* normally are exposed to less tension than drive sprockets and, therefore, may operate with wider spacing. However, this spacing should never exceed 7.5 inches (190 mm). Specific recommendations for the *minimum* number of Idle Shaft sprockets can be found in the appropriate sprocket sections of the **Product Line** pages.

On *bi-directional or "pusher" type conveyors*, where the return side belt tension is high, *both* terminal shafts must be considered as Drive Shafts when determining sprocket spacing. In addition to this, the **ADJUSTED BELT PULL** for bi-directional and pusher conveyors must be increased over the value calculated from **Formula 3** by:

FORMULA 5 **(CORRECTED ABP FOR PUSHERS)**
Corrected **ABP** = 2.2 x ABP

CONFIRMATION OF SHAFT STRENGTH

Two important functions of the drive shaft, which must be analysed before its ability to operate properly can be determined, are: (1) its ability to absorb the *bending force* of belt pull with an acceptable shaft deflection, and (2) its ability to transmit the necessary *torque* from the driver without failure.

The initial step here is to make a *preliminary* selection of a shaft size which fits your sprocket of choice. The shaft will bend or deflect under the combined loads of the **ADJUSTED BELT PULL, ABP**, and its own **WEIGHT**. It is assumed these forces are co-planar and can be combined into a **TOTAL SHAFT LOAD, w**, determined by:

FORMULA 6 **(TOTAL SHAFT LOAD)**
w = (ABP + Q) x B

The **SHAFT WEIGHT, Q**, can be found from **Table 7** on page 4-12. **B** represents the width of your belt.

SHAFT DEFLECTION

For shafts supported by *two bearings*, the **DEFLECTION, D**, can be found from:

FORMULA 7 **(SHAFT DEFLECTION — 2 BEARINGS)**
$D = \frac{5}{185} \times \frac{w \times L_s^3}{E \times I}$

MODULUS OF ELASTICITY (E) and **MOMENT OF INERTIA (I)** values can be found in **Table 7**. L_s is the *unsupported span* of the shaft between bearings.

MAXIMUM SHAFT DEFLECTION RECOMMENDATIONS

As the drive shaft bends or deflects under heavy loads, the *longitudinal distance* between the drive shaft and the idler shaft *is less at the centerline of the belt than at its edges*. This causes an uneven distribution of tension in the belt, the greatest being absorbed at the edges. Since the tension distribution is uneven, the load absorbed by the sprocket teeth is not equal. Intralox has determined that satisfactory performance can be obtained if shaft deflections do not exceed certain limits. These limits are:

CONVENTIONAL, UNI-DIRECTIONAL CONVEYORS
Maximum Shaft Deflection = 0.10 in. (2.5 mm)
BI-DIRECTIONAL OR "PUSHER" CONVEYORS
Maximum Shaft Deflection = 0.22 in. (5.6 mm)

If the *preliminary* shaft selection results in excessive deflection it will be necessary to pick a larger shaft size, a stronger material or use intermediate bearings to reduce shaft span.

DEFLECTIONS WITH INTERMEDIATE BEARINGS

With a *third bearing*, located *in the centre of the shaft*, the deflection formula to be used is:

FORMULA 8 **(SHAFT DEFLECTION —3 BEARINGS)**
$D_3 = \frac{1}{185} \times \frac{w/\ 2 \times L_s^3}{E \times I}$ $D_3 = \frac{w \times L_s^3}{370 E \times I}$

In this case, L_s is the span between the centre bearing and an outer bearing.

In cases involving very wide belts under heavy loads, it may be necessary to use *more than one* intermediate bearing to reduce deflections to an acceptable level. Since the formulas for deflections in these cases become complex and unwieldy, the designer can determine a *safe, maximum span length* for the **TOTAL SHAFT LOAD, w**, from **Tables 10-A, 10-B, 10-C**, and **10-D**, page 4-13.

In using these charts the designer is reminded to first calculate the **TOTAL SHAFT LOAD, w, (Formula 6)**. In the case of Bi-directionals and Pusher Conveyors, the **ADJUSTED BELT PULL, ABP**, must also be corrected for the increased tension required. See **Formula 5** for the corrected **ABP**.

DRIVE SHAFT TORQUE

The drive shaft must also be strong enough to transmit the twisting or rotating forces imposed by the drive motor to overcome the resistance of moving the belt and the product. The torsional action introduces shearing stresses on the shaft, usually most critical in the bearing journals adjacent to the driver.

Rather than require the designer to calculate the shearing stresses, **Table 8** on page 4-12 has been developed to quickly determine the **MAXIMUM RECOMMENDED DRIVE SHAFT TORQUE** for a given shaft journal diameter and shaft material. For example, assume your preliminary shaft selection is 2.5 in. (63.5 mm) and made of Carbon Steel. Since the *maximum* journal diameter is 2.5 in. (63.5 mm), the maximum recommended torque for *this* size is 22,500 in-lb (259,000 kg-mm).

The actual **TORQUE, T_o**, to be transmitted can be calculated from:

FORMULA 9 **(TORQUE, DRIVE SHAFT)**

$$T_O = ABP \times B \times \frac{P.D.}{2}$$

where P.D. represents your sprocket's Pitch Diameter, in. (mm).

Compare the *actual* torque with the *maximum recommended* torque to determine if this journal size is adequate. If not, try the next larger shaft size or a stronger material. If these are not possible, try a smaller sprocket size.

In many cases, the actual torque will be considerably lower than the maximum recommended. If so, reducing the journal diameter to an acceptable smaller size will reduce the cost of bearings required.

DETERMINING THE POWER NEEDED TO DRIVE THE BELT

The POWER needed to overcome the resistance of moving the belt and product can be calculated from these formulas:

FORMULA 10 **(HORSEPOWER — ENGLISH (USA) UNITS)**

$$\text{HORSEPOWER, } HP = \frac{ABP \times B \times V}{33,\ 000}$$

where: **ABP** = Adjusted Belt Pull, lb/ft of belt width
B = Belt Width, ft.
V = Belt Speed, ft/min

Another version using different factors is:

FORMULA 11 **(HORSEPOWER — ENGLISH (USA) UNITS)**

$$\text{HORSEPOWER, } HP = \frac{T_O \times V}{16,\ 000 \times P.D.}$$

where: T_o = Torque, in.-lb
P.D. = Pitch Diameter, in.

FORMULA 12 **(POWER — METRIC UNITS)**

$$\text{POWER, WATTS} = \frac{ABP \times B \times V}{6.12}$$

where: **ABP** = Adjusted Belt Pull, kg/m of belt width
B = Belt Width, m.
V = Belt Speed, m/min

and another version is:

FORMULA 13 **(POWER — METRIC UNITS)**

$$\text{POWER, WATTS} = \frac{T_O \times V}{3.06 \times P.D.}$$

where: T_o = Torque, kg-mm
P.D. = Pitch Diameter, mm

If Torque is known in Newton-millimetres the equation for Power is:

FORMULA 14 **(POWER — SI UNITS)**

$$\text{POWER, WATTS} = \frac{T_O \times V}{30 \times P.D.}$$

where: T_o = Torque, N-mm

DETERMINING DRIVE MOTOR POWER REQUIREMENTS

The power calculated to drive the belt does not include the power to overcome the friction in gears, bearings, chains and other mechanical parts of the system. Refer to Section Three, **Design Guidelines**, page 3-4, for a listing of efficiency losses in components in common use and increase the belt drive power accordingly.

THERMAL EXPANSION (CONTRACTION) OF MATERIALS

As materials experience increases or decreases in temperature, their dimensions increase or decrease likewise. Conveyor belts which are installed at one temperature and operate at another, or which pass through different temperatures in their operating circuit, will expand or contract accordingly. Since plastics have relatively high rates of expansion (contraction), this characteristic must be considered in the application of these belts if significant temperature changes are expected.

The *change* in the length, width or thickness of a material can be determined from:

FORMULA 15 (THERMAL EXPANSION OR CONTRACTION)

$$\Delta = L_1 \times (T_2 - T_1) \times e$$

where:
- Δ = change in dimension, in. (mm)
- L_1 = dimension at initial temperature, ft. (m)
- T_2 = operating temperature, °F (°C)
- T_1 = initial temperature, °F (°C)
- e = Coefficient of Thermal Expansion, in/ft/°F (mm/m/°C)

Coefficients of Thermal Expansion of various materials may be found on page 3-19.

CATENARY SAG (see discussion on page 3-7)

A belt hanging under the influence of gravity between two supports will assume the shape of a curve called a "catenary". The specific dimensions of this curve will depend upon the distance between supports, the length of hanging belt and the belt's weight.

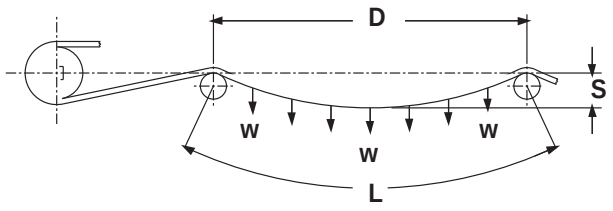


FIG. 4-2 CATENARY SAG

In most cases, the actual shape of this curve is not important, but the conveyor designer is interested in two things: the *excess belt* required *and* the *tension* created by the sagging belt.

The excess belt, **X**, or the difference between **L** and **D** in the above illustration is found from:

FORMULA 16 (EXCESS BELT —CATENARY SAG)

$$X = \frac{2.66 \times S^2}{D}$$

where:
- **X** = Excess Belt, ft. (m)
- **S** = sag, ft. (m)
- **D** = distance between supports, ft. (m)

The tension, **T**, created by a catenary section of belt, is found from:

FORMULA 17 (TENSION — CATENARY SAG)

$$T = \frac{D^2 \times W}{8 \times S}$$

where:
- **T** = tension, lb/ft (kg/m) of belt width
- **D** = distance between supports, ft. (m)
- **S** = sag, ft. (m)
- **W** = belt weight, lb/ft² (kg/m²)

English System

$$T = \frac{d^2 \times W}{96 \times s}$$

where:
- **T** = tension, lb/ft of belt width
- **d** = distance between supports, in.
- **s** = sag, in.
- **W** = belt weight, lb/ft²

Metric System

$$T = \frac{d^2 \times W}{8000 \times s}$$

where:
- **T** = tension, kg/m of belt width
- **d** = distance between supports, mm
- **s** = sag, mm
- **W** = belt weight, kg/m²

NOTE: SIDEFLEXING BELTS

Formulas for sideflexing belts are provided on a PC based Flat-Turn Program for radius applications. Call Customer Service to request a diskette.

SAMPLE PROBLEMS

STEEL CAN HANDLING EXAMPLE

Conditions (in metric units):

A beverage handler proposes to use **Series 400 Raised Rib** Polypropylene belting to carry steel cans, weighing 122 kg per square metre, on a conveyor which is 18.3 m long and 1.2 m wide. The belt will run wet on UHMW wearstrips at a speed of 6 m per minute, frequent starts under load are expected and the steel cans will "back-up" a total of 15.2 m. The operating temperature is to be 82 °C. A 12 tooth, 198 mm pitch diameter is preferred, and Carbon Steel shafts are acceptable.

STEP 1 Determine the BACKED-UP PRODUCT LOAD, M_p (Formula 1)

$$M_p = M \times F_p \times \left(\frac{\text{Percentage of Belt Area Backed-Up}}{100}\right)$$

The **COEFFICIENT OF FRICTION**, F_w, between the belt and the UHMW wearstrips, is determined from **Table 2-A**, page 4-9, to be 0.11. The **COEFFICIENT OF FRICTION**, F_p, between the steel cans and the belt, is found from **Table 2-B**, page 4-9, to be 0.26.

Since the steel cans will be backed-up 15.2 m, the *percentage* of **BELT AREA BACKED-UP** is $\frac{15.2}{18.3}$ or 83.1 percent.

Then the **BACKED-UP PRODUCT LOAD**, **Mp**, is:

$$Mp = 22 \times 0.26 \times \left(\frac{83.1}{100}\right)$$

$$Mp = 26.4 \text{ kg/m}^2$$

Calculate BELT PULL, BP, (Formula 2):

$$BP = [(M + 2W) \times F_w + M_p] \times L + (M \times H)$$

- **M** = Product Loading (122 kg/m²)
- **W** = Belt Weight (9.52 kg/m²)
- **L** = Conveyor Length (18.3 m)
- **Mp** = Backed-Up Product Load (26.4 kg/m²)
- **H** = Elevation Change (zero)

NOTE: Since there is no elevation change, disregard the factor M x H in the formula.

Therefore:

$$BP = [(122 + (2 \times 9.52)) \times 0.11 + 26.4] \times 18.3$$

$$BP = 767 \text{ kg/m of belt width}$$

ADJUSTED BELT PULL, ABP (Formula 3):

ABP = BP x SF

The **Service Factor**, **SF**, is determined from **Table 5**, page 4-11, to be 1.2.

Then: **ABP** = 767 x 1.2

ABP = 920 kg/m of belt width

CALCULATE THE ALLOWABLE BELT STRENGTH, ABS (Formula 4):

ABS = **BS** x **T** x **S**

The *rated* **BELT STRENGTH**, **BS**, can be found from **Table 3**, page 4-10, to be 3,570 kg/m of width.

With the operating temperature of 82 °C, the **TEMPERATURE FACTOR**, **T**, found from **Table 6**, page 4-11, is 0.48.

To determine the **STRENGTH FACTOR**, **S**, first calculate the **SPEED/LENGTH** ratio of 6.0/18.3 or 0.33. From page 2-24, **S** is 1.0.

theN: **ABS** = 3,570 x 0.48 x 1.0

ABS = 1,714 kg/m of belt width

Since the ABS exceeds ABP, this belt is strong enough for this application.

MAXIMUM SPACING OF DRIVE SHAFT SPROCKETS:

From page 2-27, the **MAXIMUM SPROCKET SPACING** should be about 140 mm.

DETERMINE DRIVE SHAFT DEFLECTION:

Since this is a fairly wide belt, first try a 60 mm square shaft.

The **TOTAL SHAFT LOAD, w**, is calculated by:

w = (ABP + Q) x B (Formula 6)

From **Table 7**, page 4-12, find **Q**, the **SHAFT WEIGHT**, to be 29.11 kg/m of length. Then:

w = (920 + 29.11) x 1.2

w = 1139 kg

For **SHAFT DEFLECTION**, assume first the shaft is to be supported by two bearings. Therefore the **DEFLECTION, D**, is found from:

$$D = \frac{5}{384} \times \frac{w \times L_S^3}{E \times I} \quad \text{(Formula 7)}$$

Since the belt is to be 1.2 m or 1200 mm wide, assume the **unsupported LENGTH OF SHAFT, L_s** is 1320 mm, *and* from **TABLE 7**, page 4-12, the **MODULUS OF ELASTICITY, E**, and the **MOMENT OF INERTIA, I**, are found to be 21,100 kg/mm² and 1,080,000 mm⁴, respectively. Then:

$$D = \frac{5}{384} \times \frac{1139 \times 1320^3}{21,\ 000 \times 1,\ 080,\ 000}$$

D = 1.50 mm

Since this deflection is less than the recommended limit of 2.5 mm, supporting it with two bearings is acceptable.

DRIVE SHAFT TORQUE, T_o (Formula 9):

$$T_o = ABP \times B \times \frac{P.D.}{2}$$

$$T_o = 920 \times 1.2 \times \frac{198}{2}$$

= 109296 kg-mm

From the **MAXIMUM RECOMMENDED TORQUE** curve, **Table 8**, on page 4-12, we see the maximum torque for a journal diameter of 60 mm is 180,000 kg-mm. Therefore, the *minimum* journal diameter in this case should be about 55 mm.

BELT DRIVE POWER (Formula 10):

$$\text{BELT POWER} = \frac{ABP \times B \times V}{6.12}$$

$$\text{BELT POWER} = \frac{920 \times 1.2 \times 6.0}{6.12}$$

BELT POWER = 1082 Watts

DETERMINE DRIVE MOTOR POWER:

Assume this conveyor will be driven by an electric motor, through a triple reduction, spur gear reducer, chain and sprockets. The shafts are supported by ball bearings. From the table on page 3-4, the *total* of the efficiency losses in the machinery components are estimated to be 11%.

The **MOTOR POWER** is found from:

$$\text{MOTOR POWER} = \frac{1082}{100 - 11} \times 100$$

= 1216 Watts

Therefore a 2 kW motor will be a good choice.

FOOD HANDLING EXAMPLE

Conditions (in U.S. units):

120,000 lb/hr of raw, washed vegetables (product loading of 10 lb/sq ft) are to be lifted a vertical distance of 15 ft. on an *elevating* conveyor 25 ft. long and 2 ft. wide. The environment is wet, the temperature is ambient and belt speed is to be 75 ft/min. Wearstrip material is UHMW and the preselected belt is a **Series 800 Perforated Flat Top** polypropylene with flights and sideguards. The flight spacing is 8 in. The belt will be started unloaded and run continuously. The preferred sprockets are 10 tooth, 6.5 in. pitch diameter. Stainless Steel (303) shafts are required.

STEP 1 DETERMINE THE BACKED-UP PRODUCT LOAD, M_p (Formula 1)

$$M_p = M \times F_p \times \left(\frac{\text{Percentage of Belt Area Backed-Up}}{100}\right)$$

Since there is no product backed-up, disregard M_p. From **Table 2-A**, page 4-9, F_w = **0.11**.

BELT PULL, BP (Formula 2):

BP = (M + 2W) x L x F + (M x H)
BP = [10 + 2 (1.54)] x 25 x 0.11 + (10 x 15)
BP = 186 lb/ft of belt width

ADJUSTED BELT PULL, ABP (Formula 3):

ABP = BP x SF

SERVICE FACTOR is 1.4 (See **Table 5**, Elevating Conveyor).

Then: **ABP** = 186 x 1.4
ABP = 260 lb/ft of belt width

ALLOWABLE BELT STRENGTH, ABS (Formula 4):

ABS = **BS** x **T** x **S**

The **RATED BELT STRENGTH, BS**, is 1,000 lb/ft from **Table 3. TEMPERATURE FACTOR**, **T**, is 0.98 and **STRENGTH FACTOR**, **S**, is 0.92. (See **Table 6** and page 2-34.)

ABS = 1000 x 0.98 x 0.92
ABS = 902 lb/ft of belt width

Since **ABS** exceeds **ABP, Series 800 Perforated Flat Top** Polypropylene belting is adequate for this application.

MAXIMUM SPACING OF DRIVE SHAFT SPROCKETS:

From page 2-37, is 6.0 in.

DETERMINE DRIVE SHAFT DEFLECTION:

Total Shaft Load, w, is:

w = (ABP + Q) x B (Formula 6)

Pre-select a 1.5 in. square Stainless Steel shaft.

Therefore: **w** = (260 + 7.65) x 2
w = 535 lb

and **SHAFT DEFLECTION, D**, is:

$$D = \frac{5}{384} \times \frac{w \times L_{S^3}}{E \times I} \text{ (Formula 7)}$$

Assume L_s is 28 in. From **Table 7, E** is 28,000,000 lb/in² and **I** is 0.42 in.^{4}.

$$\text{Therefore: } D = \frac{5}{384} \times \frac{535 \times 28^3}{28,\ 000,\ 000 \times 0.42}$$

D = 0.013 in.

which is less than the recommended limit of 0.10 in.

DRIVE SHAFT TORQUE, T_o (Formula 9):

$$T_o = ABP \times B \times \frac{P.D.}{2}$$

$$T_o = 260 \times 2 \times \frac{6.5}{2}$$

= 1,690 in-lb

From **Table 8**, a torque of 1,690 in/lb requires a *minimum* journal diameter of about 0.85 in. with 303 Stainless Steel, therefore, a journal diameter of 1.0 in. is recommended.

BELT DRIVE POWER (Formula 10):

$$\text{BELT HORSEPOWER} = \frac{ABP \times B \times V}{33,000}$$

$$\text{BELT HORSEPOWER} = \frac{260 \times 2 \times 75}{33,000}$$

BELT HORSEPOWER = 1.18 HP

DETERMINE DRIVE MOTOR POWER:

Assume it is determined from page 3-4 that the total efficiency losses are expected to be 20%. The **MOTOR HORSEPOWER**, then, is found from:

$$\text{MOTOR HORSEPOWER} = \frac{1082}{100 - 11} \times 100$$

MOTOR HORSEPOWER = 1.48 HP

In this case, a 1.5 HP motor will be a suitable choice.

BIDIRECTIONAL CONVEYOR EXAMPLE

Conditions (in metric units):

A canning plant accumulator table, measuring 6 m in length and 2.4 m wide, is to handle cans weighing 50 kg/m². Belt speed will be 3.0 m/min. Frequent loaded starts are expected. The belt will operate at 21 °C. The wearstrips are to be Stainless Steel. The belt will run dry. **Series 900 Raised Rib** in Acetal is the preferred belt, using 18 tooth, 156 mm pitch diameter sprockets on 60 mm square shafts of 304 Stainless Steel.

STEP 1 DETERMINE THE BACKED-UP PRODUCT LOAD, M_p (Formula 1)

$$M_p = M \times F_p \times \left(\frac{\text{Percentage of Belt Area Backed-Up}}{100}\right)$$

Since there is no product backed-up, ignore M_p.

F_w = 0.19

CALCULATE BELT PULL, BP (Formula 2):

BP = (M + 2W) x L x F + (M x H)
M = 50 kg/m²
W = 8.19 kg/m²
L = 6 m
F_w = 0.19 (above)
H = zero
BP = [50 + 2(8.19)] x 0.19 x 6
BP = 76 kg/m of width

CALCULATE ADJUSTED BELT PULL, ABP (Formula 3):

ABP = BP x SF
SF = 1.2
ABP = 76 x 1.2
ABP = 91 kg/m of width

ALLOWABLE BELT STRENGTH, ABS (Formula 4):

ABS = **BS** x **T** x **S**

BS = RATED BELT STRENGTH (see page 4-10)
T = 0.98 (see page 4-11)
S = 1.0 (see page 4-11)
ABS = 2200 x 0.98 x 1.0
ABS = 2156 kg/m of width

Therefore, since **ABS** exceeds **ABP, Series 900 Raised Rib** in Acetal is a suitable choice.

DETERMINE MAXIMUM SPACING OF DRIVE SHAFT SPROCKETS:

Since both the carryway and returnway sides will be under the tension of the **ABP**, the sprocket spacing must be based on two times the **ABP**. (Refer to page 3-11, **Design Guidelines**.) Also to be noted are that idle shafts are to be treated as drive shafts for sprocket spacing and deflection calculations.

CORRECTED ABP = 2 x ABP
= 2 x 91
CORRECTED ABP = 182 kg/m of width

From the chart on page 2-52, the **MAXIMUM SPROCKET SPACING** is 102 mm.

DETERMINE DRIVE SHAFT DEFLECTION:

Total Shaft Load, w, is: (Formula 6)

w = (Corrected ABP + Q) x B
w = (182 + 29.11) x 2.4
w = 507 kg

A check of the **Maximum Drive and Idler Shaft Span Length, Table 10-C**, page 4-13, reveals that the shaft load of 507 kg applied to a 60 mm square Stainless Steel shaft. This allows a maximum span of about 2600 mm. Since this conveyor is 2.4 m or 2400 mm wide, intermediate bearings should not be required.

CALCULATE DRIVE SHAFT TORQUE, T_o (Formula 9):

$$T_o = ABP \times B \times \frac{P.D.}{2}$$

ABP = 91 kg/m of width
B = 2.4 m of width
P.D. = 156 mm

$$T_o = 91 \times 2.4 \times \frac{156}{2}$$

T_o = 17,035 kg-mm

From the chart of **MAXIMUM RECOMMENDED TORQUE**, page 4-12, the *minimum* journal diameter for a torque of 17,035 kg-mm would be about 20 mm. Since a 60 mm shaft is needed, due to deflection, the journal diameter may be as large as 55 mm, for example.

CALCULATE THE POWER TO DRIVE THE BELT (Formula 10):

$$\text{BELT POWER} = \frac{ABP \times B \times V}{6.12}$$

ABP = 91 kg/m of width (above)
B = 2.4 m width (above)
V = 3.0 m/min (above)

$$\text{BELT POWER} = \frac{91 \times 2.4 \times 3.0}{6.12}$$

BELT POWER = 107 Watts

CALCULATE DRIVE MOTOR POWER:

Refer to page 3-4, **Design Guidelines**, for efficiency losses in mechanical components. Assume the total of the efficiency losses for this conveyor are determined to be about 25%. Therefore, **MOTOR POWER** is:

$$\text{MOTOR POWER} = \frac{107}{100 - 25} \times 100$$

MOTOR POWER = 143 Watts

Therefore a 1/4 kW motor would be a good selection.

TABLES

TABLE 1 — (W) BELT WEIGHT IN lb/ft² (kg/m²)

SERIES	STYLE	STANDARD MATERIALS			SPECIAL APPLICATIONS MATERIALS•
		POLYPROPYLENE	POLYETHYLENE	ACETAL & EC ACETAL	
100	FLUSH GRID	0.54 (2.64)	0.58 (2.83)	0.78 (3.81)	—
	RAISED RIB	0.82 (4.00)	0.88 (4.29)	1.20 (5.86)*	—
200	OPEN GRID	1.24 (6.05)	1.26 (6.15)	—	—
	FLAT TOP	1.18 (5.76)	1.20 (5.86)	—	—
	PERFORATED FLAT TOP	1.12 (5.47)	1.18 (5.76)	—	—
	OPEN HINGE	1.04 (5.08)	1.12 (5.47)	—	—
	FLUSH GRID	1.40 (6.83)	1.44 (7.03)	—	—
400	FLUSH GRID	1.82 (8.89)	1.90 (9.28)	2.77 (13.51)	—
	RAISED RIB	1.95 (9.52)	1.98 (9.67)	—	—
	OPEN HINGE	1.16 (5.66)	1.24 (6.06)	—	—
	FLAT TOP	1.81 (8.82)	1.90 (9.28)	2.74 (13.38)	—
	NON SKID	—	—	2.88 (14.09)	
800	FLAT TOP	1.77 (8.66)	1.87 (9.13)	2.75 (13.43)*	IR NYLON (2-31)
	PERFORATED FLAT TOP	1.54 (7.52)	1.59 (7.76)	2.28 (11.15)*	—
	PERFORATED FLAT TOP 5/32" ROUND	1.54 (7.52)	1.59 (7.76)	—	—
	MINI RIB	1.90 (9.23)	1.98 (9.67)	2.92 (14.26)	—
	NUB TOP	1.90 (9.23)	2.01 (9.80)	2.95 (14.40)	—
	CONE TOP	1.84 (8.97)	1.93 (9.44)	2.84 (13.89)	—
	ROLLER TOP	2.93 (14.34)	2.99 (14.62)	4.11 (20.10)	—
900	OPEN GRID	0.81 (3.95)	0.84 (4.09)	1.26 (6.14)*	—
	FLUSH GRID	0.76 (3.70)	0.81 (3.96)	1.15 (5.62)	FR & HR NYLON (2-40)
	RAISED RIB	1.07 (5.21)	1.14 (5.57)	1.68 (8.19)	HR NYLON (2-41)
	FLAT TOP	0.96 (4.69)	1.01 (4.95)	1.50 (7.30)	HR NYLON (2-42)
	PERFORATED FLAT TOP ∅ 1/8"	—	—	1.48 (7.23)*	—
	PERFORATED FLAT TOP ∅ 5/32"	0.93 (4.54)	0.98 (4.79)	1.46 (7.11)*	FR & HR NYLON (2-43)
	PERFORATED FLAT TOP ∅ 3/16"	—	—	1.43 (6.98)*	FR MATERIAL (2-43)
	DIAMOND FRICTION TOP	1.40 (6.80)	1.50 (7.30)	—	—
	FLAT FRICTION TOP	1.40 (6.80)	—	—	—
	MESH TOP	0.93 (4.55)	0.99 (4.84)	1.39 (6.80)	—
1100	FLUSH GRID	0.81 (3.98)	0.87 (4.25)	1.19 (5.80)	FR & HR NYLON (2-51)
	FLAT TOP	0.90 (4.40)	0.96 (4.69)	1.30 (6.35)	—
	PERFORATED FLAT TOP	—	—	1.30 (6.35)	—
	FLUSH GRID FRICTION TOP	0.81 (3.98)	—	—	—
1400	FLAT TOP	—	—	2.75 (13.43)*	—
	FLAT FRICTION TOP	2.24 (10.94)	—	—	—
1800	FLAT TOP	2.06 (10.06)	2.23 (10.90)	3.36 (16.40)	—
2000	RAISED RIB	1.75 (8.53)	1.83 (8.92)	2.68 (13.08)*	—
2200	FLUSH GRID	1.86 (9.10)	1.96 (9.56)	2.82 (13.80)*	—
2400	FLUSH GRID	1.14 (5.57)	1.21 (5.92)	1.63 (7.97)	
3000	KNUCKLE CHAIN (STAIGHT)	—	—	0.88 lb/ft (1.21 kg/m)*	—
	KNUCKLE CHAIN (TURNING)	—	—	0.90 lb/ft (1.25 kg/m)*	—
4000	4009 FLUSH GRID	—	—	0.97 (1.44)	—
	4009 FLAT TOP	—	—	1.11 (1.65)	—
	4014 FLAT TOP	—	—	0.97 (1.44)	—

To determine weight for flighted belts, multiply the weight from the table by the following factors:

4" (100 mm) Flight Spacing= Factor of 1.20
8" (200 mm) Flight Spacing= Factor of 1.15
12" (300 mm) Flight Spacing= Factor of 1.10
16" (400 mm) Flight Spacing= Factor of 1.08
24" (600 mm) Flight Spacing= Factor of 1.05

* The belts styles are not available in EC Acetal

• Refer to data page listed for specific weights

TABLE 2A — (F_W) COEFFICIENT OF START-UP FRICTION BETWEEN WEARSTRIP & BELT

WEARSTRIP MATERIAL	STANDARD MATERIALS**									
	POLYPROPYLENE				POLYETHYLENE		ACETAL		EC ACETAL	
	SMOOTH SURFACE		ABRASIVE*** SURFACE		SMOOTH SURFACE		SMOOTH SURFACE		SMOOTH SURFACE	
	WET	DRY	WET	DRY	WET	DRY	WET	DRY	WET	DRY
U.H.M.W.	0.11	0.13	NR	NR	0.24	0.32*	0.10	0.10	0.10	0.10
H.D.P.E.	0.09	0.11	NR	NR	NR	NR	0.09	0.08	0.09	0.08
Molybdenum- or Silicon-filled Nylon	0.24	0.25	0.29	0.30	0.14	0.13	0.13	0.15	0.13	0.15
Cold-Rolled Finish Stainless or Carbon Steel	0.26	0.26*	0.31	0.31*	0.14	0.15*	0.18	0.19*	0.18	0.19*

* Increased wear may be experienced at belt speeds above 50 feet per minute (15 metre/min).
** For Special Applications Materials see appropriate data pages.
*** Based on Intralox tests.

TABLE 2B — (F_p) COEFFICIENT OF RUNNING FRICTION BETWEEN CONTAINER & BELT

CONTAINER MATERIAL	STANDARD MATERIALS**									
	POLYPROPYLENE				POLYETHYLENE		ACETAL		EC ACETAL	
	WET	DRY	WET	DRY	WET	DRY	WET	DRY	WET	DRY
Glass	0.18	0.19	0.08	0.09	0.13	0.14	0.13	0.14	0.13	0.14
Steel	0.26	0.32	0.10	0.13	0.19	0.20	0.19	0.20	0.19	0.20
Plastic	0.11	0.17	0.08	0.08	0.13	0.16	0.13	0.16	0.13	0.16
Cardboard	—	0.21	—	0.15	—	0.18	—	0.18	—	0.18
Aluminium	0.40	0.40	0.20	0.24	0.33	0.27	0.33	0.27	0.33	0.27

* For Special Applications Materials see appropriate data pages.
** Polyethylene generally not recommended for container handling.
NOTE: Belts operating dry on a backed-up conveyor may, depending on speed and weight, wear a rough surface on the belting, which may substantially increase the Coefficient of Friction.

TABLE 3 - BELT STRENGTHS IN lb/ft (kg/m)

SERIES	STYLE	STANDARD MATERIALS			
		POLYPROPYLENE	POLYETHYLENE	ACETAL	EC ACETAL
100	FLUSH GRID	300 (450)	200 (300)	600 (890)	400 (595)
	RAISED RIB	300 (450)	200 (300)	600 (890)	—
200	OPEN GRID	1400 (2080)	900 (1340)	—	—
	FLAT TOP	1400 (2080)	900 (1340)	—	—
	PERFORATED FLAT TOP	1400 (2080)	900 (1340)	—	—
	OPEN HINGE	300 (450)	200 (300)	—	—
	FLUSH GRID	1800 (2680)	1200 (1790)	—	—
400	FLUSH GRID	2400 (3570)	1800 (2680)	3200 (4760)	2400 (3570)
	RAISED RIB	2400 (3570)	1800 (2680)	—	—
	OPEN HINGE	1550 (2300)	950 (1400)	—	—
	FLAT TOP	2400 (3570)	1800 (2680)	3200 (4760)	2400 (3570)
	NON SKID	—	—	3200 (4760)	2400 (3570)
800	FLAT TOP	1000 (1490)	500 (750)	900 (1340)	—
	PERFORATED FLAT TOP	1000 (1490)	500 (750)	900 (1340)	—
	PERFORATED FLAT TOP ROUND HOLE	1000 (1490)	500 (750)	—	—
	MINI RIB	1000 (1490)	500 (750)	900 (1340)	—
	NUB TOP	1000 (1490)	500 (750)	900 (1340)	—
	CONE TOP	1000 (1490)	500 (750)	900 (1340)	—
	ROLLER TOP	1000 (1490)	500 (750)	900 (1340)	—
900	OPEN GRID	700 (1040)	350 (520)	1480 (2200)	—
	FLUSH GRID	700 (1040)	350 (520)	1480 (2200)	800 (1190)
	RAISED RIB	700 (1040)	350 (520)	1480 (2200)	800 (1190)
	FLAT TOP	700 (1040)	350 (520)	1480 (2200)	800 (1190)
	PERFORATED FLAT TOP ∅ 1/8"	—	—	1480 (2200)	—
	PERFORATED FLAT TOP ∅ 5/32"	700 (1040)	350 (520)	1480 (2200)	—
	PERFORATED FLAT TOP ∅ 3/16"	—	—	1480 (2200)	—
	DIAMOND FRICTION TOP	1000 (1490)	350 (520)	—	—
	FLAT FRICTION TOP	1000 (1490)	—	—	—
	MESH TOP	700 (1040)	350 (520)	—	—
1100	FLUSH GRID	700 (1040)	450 (670)	1300 (1940)	800 (1190)
	FLAT TOP	500 (750)	300 (450)	1000 (1490)	—
	PERFORATED FLAT TOP	—	—	1000 (1490)	—
	FLUSH GRID FRICTION TOP	700 (1040)	—	—	—
1400	FLAT TOP	—	—	2500 (3720)	—
	FLAT FRICTION TOP	1800 (2678)	—	—	—
1800	FLAT TOP	1400 (2080)	700 (1040)	1200 (1790)	—
2000	RAISED RIB	500 (750)	400 (605)	1130 (1680)	—
2200	FLUSH GRID (STRAIGHT)	1600 (2380)	1000 (1490)	2500 (3720)	—
2400	FLUSH GRID (STRAIGHT)	1200 (1785)	—	1700 (2528)	—
3000	KNUCKLE CHAIN (STAIGHT)	—	—	700 lb (317 kg)	—
	KNUCKLE CHAIN (TURNING)	—	—	560 lb (254 kg)	—
4000	4009 FLUSH GRID	—	—	500 lb (227 kg)	—
	4009 FLAT TOP	—	—	500 lb (227 kg)	—
	4014 FLAT TOP	—	—	500 lb (227 kg)	—

* For Special Applications Materials see appropriate data pages.

TABLE 4 — SPROCKET AND SUPPORT QUANTITY REFERENCE

*Belt Width Range	**Minimum Number of Sprockets Per Shaft			Minimum Number of Supports			
in. (mm)	SERIES 200	SERIES 100, 400, 800, 1400, 2000	SERIES 900, 1100, 2200	SERIES 100, 900, 1100, 1400		SERIES 200, 400, 800, 2000, 2200	
				Carryway	Returnway	Carryway	Returnway
2 (51)	1	1	1	2	2	2	2
4 (102)	1	1	1	2	2	2	2
6 (152)	2	2	2	2	2	2	2
7 (178)	2	2	2	3	2	2	2
8 (203)	2	2	2	3	2	2	2
10 (254)	2	2	3	3	2	3	2
12 (305)	3	3	3	3	2	3	2
14 (356)	3	3	5	4	3	3	3
15 (381)	3	3	5	4	3	3	3
16 (406)	3	3	5	4	3	3	3
18 (457)	3	3	5	4	3	3	3
20 (508)	3	5	5	5	3	4	3
24 (610)	5	5	7	5	3	4	3
30 (762)	5	5	9	6	4	5	4
32 (813)	5	7	9	7	4	5	4
36 (914)	5	7	9	7	4	5	4
42 (1067)	7	7	11	8	5	6	5
48 (1219)	7	9	13	9	5	7	5
54 (1372)	9	9	15	10	6	7	6
60 (1524)	9	11	15	11	6	8	6
72 (1829)	11	13	19	13	7	9	7
84 (2134)	13	15	21	15	8	11	8
96 (2438)	13	17	25	17	9	12	9
120 (3048)	17	21	31	21	11	15	11
144 (3658)	21	25	37	25	13	17	13
For Other Widths	**Use Odd Number of Sprockets at a Maximum 7.5 in. (191 mm) Spacing**	**Use Odd Number of Sprockets at a Maximum 6 in. (152 mm) Spacing**	**Use Odd Number of Sprockets at a Maximum 4 in. (102 mm) Spacing**	**Maximum 6 in. (152 mm) Spacing**	**Maximum 12 in. (305 mm) Spacing**	**Maximum 9 in. (229 mm) Spacing**	**Maximum 12 in. (305 mm) Spacing**

* Actual belt widths will vary from nominal. If actual width is critical, contact Customer Service.
** Fix centre sprocket only. (With two sprockets on shaft, fix right hand sprocket only.):

NOTE
1) If carryways extend into sprocket area, care should be taken to insure sprockets do not interfere with carryways.
2) Series 600 carryway and returnway conditions explained on page 3-16.
3) These are the minimum number of sprockets. Additional sprockets may be required, see Data Pages for specific applications.

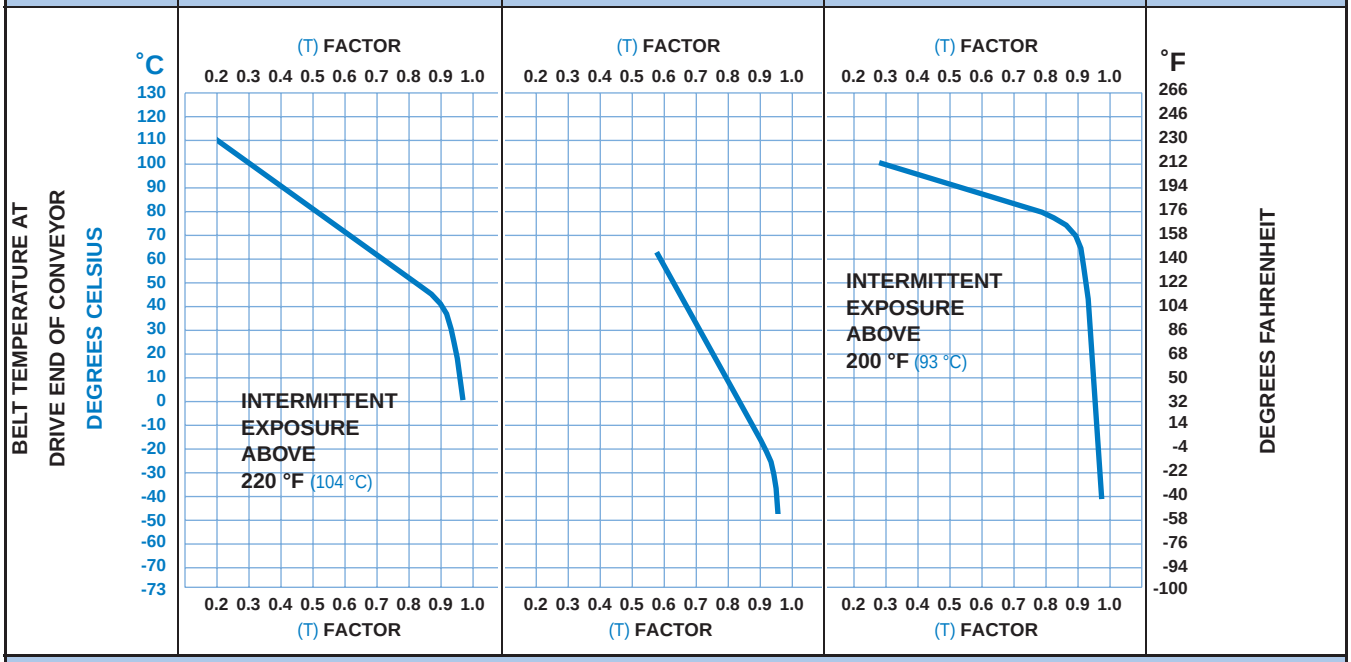
TABLE 5 — (SF) SERVICE FACTOR

Starts under no load, with load applied gradually ..... 1.0 _____
Frequent starts under load (more than once per hour) ..... ADD 0.2 ..... _____
At speeds greater than 100 FPM (Feet Per Minute) (30 meters/min) ..... ADD 0.2 ..... _____
Elevating Conveyors ..... ADD 0.4 ..... _____
Pusher Conveyors ..... ADD 0.2 ..... _____
TOTAL

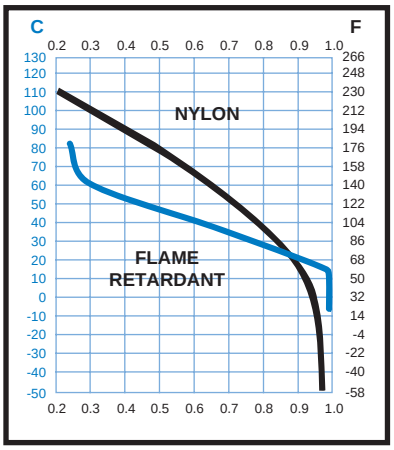
NOTE: At speeds greater than 50 FPM (15 meters/min) on conveyors that are started with backed-up lines, soft start motors should be considered.

TABLE 6 — (T) TEMPERATURE FACTOR

STANDARD MATERIALS**



SPECIAL APPLICATION MATERIALS



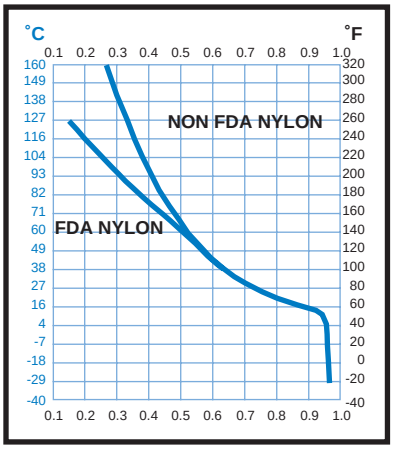


TABLE 7				
B-SHAFT DATA	(Q) SHAFT WEIGHT, lb/ft (kg/m)			I MOMENT OF INERTIA in.^{4} (mm^4)
SIZE	ALUMINIUM	CARBON STEEL	STAINLESS STEEL	
5/8" SQUARE	0.46	1.33*	1.33*	0.013
1" SQUARE	1.17*	3.40*	3.40*	0.083
1.5" SQUARE	2.64*	7.65*	7.65*	0.42
2.5" SQUARE	7.34	21.25*	21.25*	3.25
3.5" SQUARE	14.39	41.60*	41.60	12.50
25 mm SQUARE	(1.699)	(4.920)**	(4.920)**	(32.550)
40 mm SQUARE	(4.335)	(12.55)**	(12.55)**	(213,300)
60 mm SQUARE	(10.05)	(29.11)**	(29.11)**	(1,080,000)
65 mm SQUARE	(11.79)	(34.16)**	(34.16)**	(1,487,600)
E MODULUS OF ELASTICITY lb/ln² (kg/mm²)	10,000,000 (7000)	30,000,000 (21,100)	28,000,000 (19,700)	

** Intralox USA can supply square shafting machined to specifications in these sizes in Carbon Steel (C-1018), Stainless Steel (303 and 316), and Aluminium (6061-T6).
** Intralox Europe offers square shafting in these sizes in Carbon Steel (KG-37) and Stainless Steel (304).

TABLE 8 — MAXIMUM RECOMMENDED TORQUE ON DRIVE SHAFT

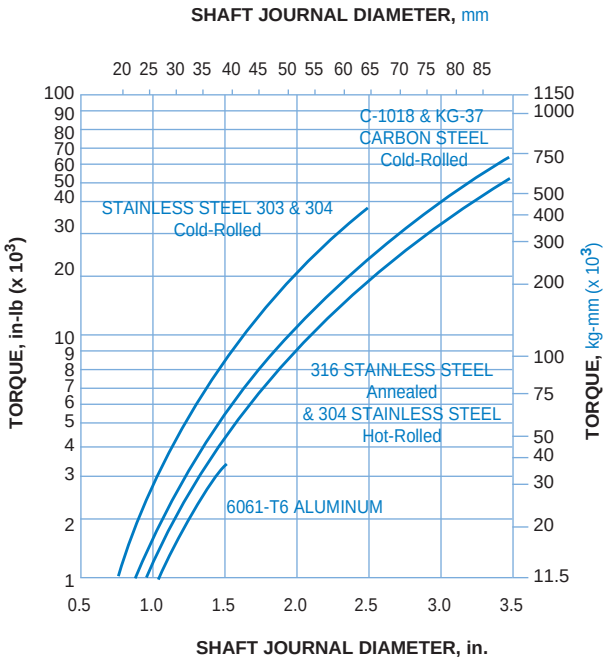
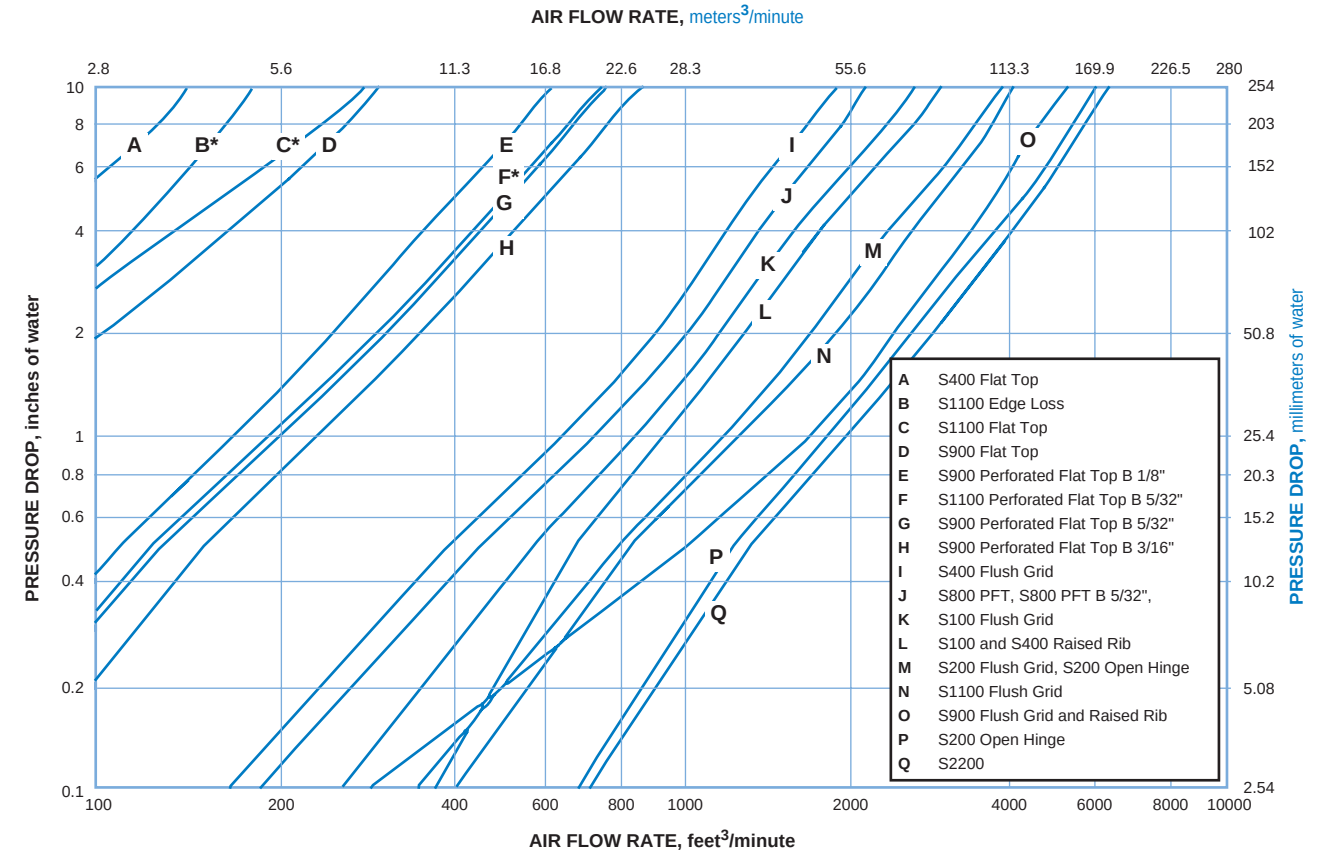


TABLE 9 — AIR FLOW RATE THROUGH BELT, PER SQUARE FOOT OF BELT AREA

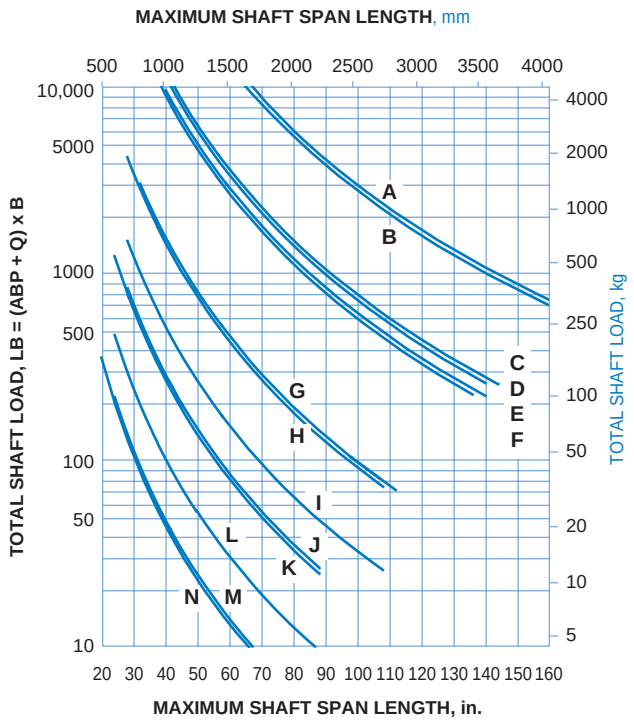


***SERIES 1100 FLAT TOP/PERFORATED FLAT TOP EDGE LOSS**:
In order to go around a 0.75 inch nosebar and achieve self-clearing dead plates, the **Series 1100 Flat Top/Perforated Flat Top belt** does not have a sealed edge. To accurately size the fan, both airflow through the belt and edge loss of airflow must be considered. This example describes how to size the fan flow required for the **Series 1100 Perforated Flat Top belt**.

For a 30 inch wide belt that is 10 feet long, under a vacuum of 4 inches of water, the area under vacuum is 25 square feet. The length under vacuum is 10 feet. As per the Airflow Table, at a vacuum of 4 inches of water, airflow is 450 SCFM per square foot through the belt and 110 SCFM per linear foot for the edge. SCFM = (square feet belt under vacuum x airflow through the belt) + (linear feet belt x edge loss). Therefore, total flow is (25 x 450) + (10 x 110) = 12,350 SCFM.

TABLE 10A — MAXIMUM DRIVE SHAFT SPAN LENGTH (CONVENTIONAL CONVEYORS)

10A **WITH ONLY 2 BEARINGS**
Maximum Allowed Deflection = 0.10 in. (2.5 mm)



10B **WITH 3 OR MORE BEARINGS, EQUALLY SPACED**
Maximum Allowed Deflection = 0.10 in. (2.5 mm)

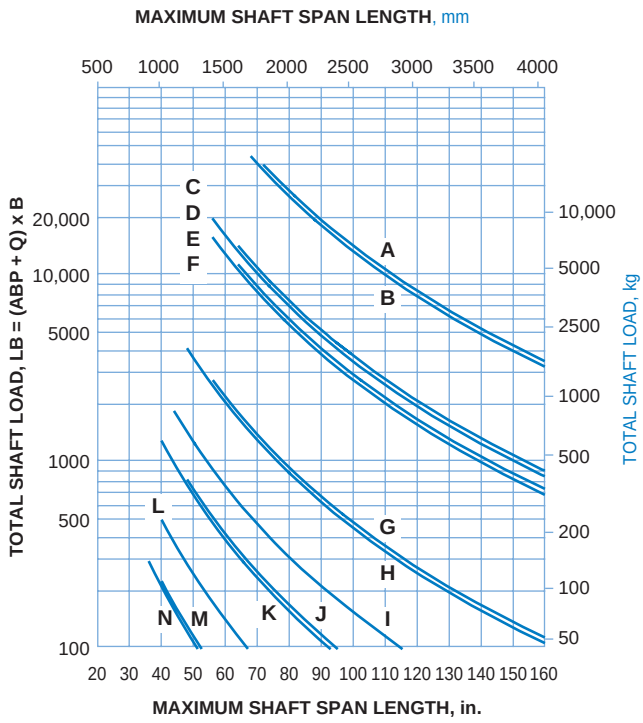
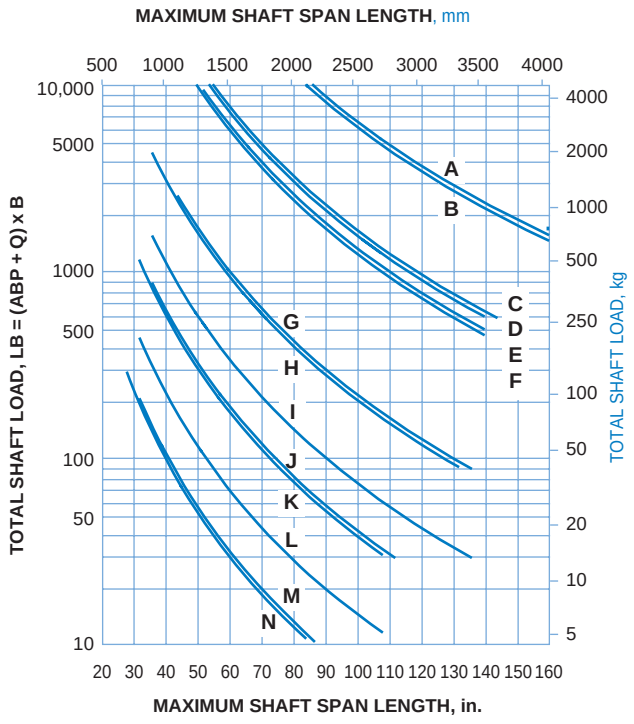
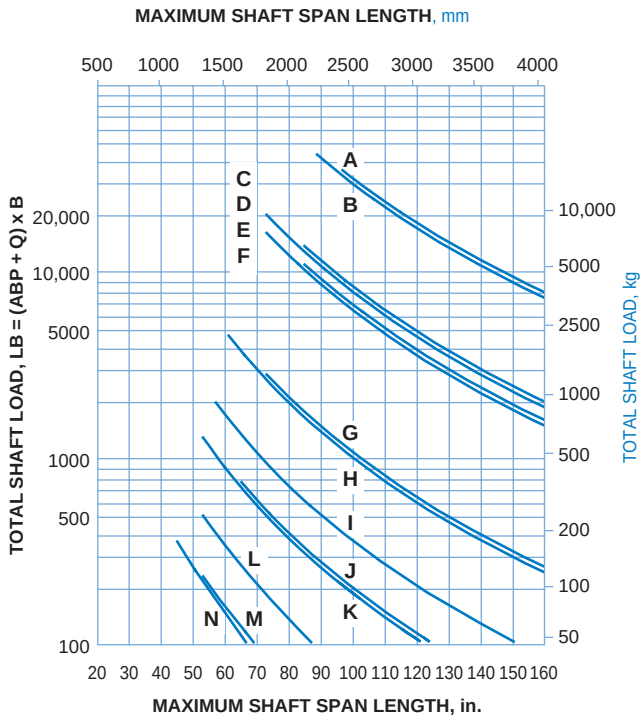


TABLE 10B — MAXIMUM DRIVE & IDLER SHAFT SPAN LENGTH (BIDIRECTIONAL & PUSHER CONVEYORS)

10C **WITH ONLY 2 BEARINGS**
Maximum Allowed Deflection = 0.22 in. (5.6 mm)



10D **WITH 3 OR MORE BEARINGS, EQUALLY SPACED**
Maximum Allowed Deflection = 0.22 in. (5.6 mm)



A	3.5" and 90 mm Square Carbon Steel
B	3.5" and 90 mm Square Stainless Steel
C	2.5" and 65 mm Square Carbon Steel
D	2.5" and 65 mm Square Stainless Steel
E	60 mm Square Carbon Steel
F	60 mm Square Stainless Steel
G	1.5" and 40 mm Square Carbon Steel
H	1.5" and 40 mm Square Stainless Steel
I	1.5" Square Aluminium
J	1.0" and 25.4 mm Square Carbon Steel
K	1.0" and 25.4 mm Square Stainless Steel
L	1.0" Square Aluminium
M	5/8" Square Carbon Steel
N	5/8" Square Stainless Steel

MEASUREMENT CONVERSION FACTORS

ENGLISH (USA) UNIT	MULTIPLY BY →	METRIC (SI) UNIT	MULTIPLY BY →	ENGLISH (USA) UNIT
LENGTH				
inch (in.)	25.40	millimetre (mm)	0.03937	inch (in.)
inch (in.)	0.0254	metre (m)	39.37	inch (in.)
foot (ft.)	304.8	millimetre (mm)	0.0033	foot (ft.)
foot (ft.)	0.3048	metre (m)	3.281	foot (ft.)
AREA				
inch² (in.²)	645.2	millimetre² (mm²)	0.00155	inch² (in.²)
inch² (in.²)	0.000645	metre² (m²)	1550.0	inch² (in.²)
foot² (ft.²)	92,903	millimetre² (mm²)	0.00001	foot² (ft.²)
foot² (ft.²)	0.0929	metre² (m²)	10.764	foot² (ft.²)
VOLUME				
foot³ (ft.³)	0.0283	metre³ (m³)	35.31	foot³ (ft.³)
foot³ (ft.³)	28.32	liter (l)	0.0353	foot³ (ft.³)
VELOCITY and SPEED				
foot/second (ft/s)	18.29	metre/min (m/min)	0.0547	foot/second (ft/s)
foot/minute (ft/min)	0.3048	metre/min (m/min)	3.281	foot/minute (ft/min)
MASS and DENSITY				
pound-avdp. (lb)	0.4536	kilogram (kg)	2205	pound-avdp. (lb)
pound/foot³ (lb/ft³)	16.02	kilogram/meter³ (kg/m³)	0.0624	pound/foot³ (lb/ft³)
FORCE and FORCE/LENGTH				
pound-force (lb)	0.4536	kilogram-force (kg)	2.205	pound-force (lb)
pound-force (lb)	4.448	Newton (N)	0.225	pound-force (lb)
kilogram-force (kg)	9.807	Newton (N)	0.102	kilogram-force (kg)
pound/foot (lb/ft)	1.488	kilogram/metre (kg/m)	0.672	pound/foot (lb/ft)
pound/foot (lb/ft)	14.59	Newton/metre (N/m)	0.0685	pound/foot (lb/ft)
kilogram/metre (kg/m)	9.807	Newton/metre (N/m)	0.102	kilogram/metre (kg/m)
TORQUE				
inch-pound (in-lb)	11.52	kilogram-millimetre (kg-mm)	0.0868	inch-pound (in-lb)
inch-pound (in-lb)	0.113	Newton-metre (N-m)	8.85	inch-pound (in-lb)
kilogram-millimetre (kg-mm)	9.81	Newton/millimetre (N-mm)	0.102	kilogram-millimetre (kg-mm)
MOMENT of INERTIA				
inch⁴ (in.⁴)	416,231	millimetre⁴ (mm⁴)	0.0000024	inch⁴ (in.⁴)
inch⁴ (in.⁴)	41.62	centimetre⁴ (cm⁴)	0.024	inch⁴ (in.⁴)
PRESSURE and STRESS				
pound/inch² (lb/in²)	0.0007	kilogram/millimetre² (kg/mm²)	1422	pound/inch² (lb/in²)
pound/inch² (lb/in²)	0.0703	kilogram/centimetre² (kg/cm²)	14.22	pound/inch² (lb/in²)
pound/inch² (lb/in²)	0.00689	Newton/millimetre² (N/mm²)	145.0	pound/inch² (lb/in²)
pound/inch² (lb/in²)	0.689	Newton/centimetre² (N/cm²)	1.450	pound/inch² (lb/in²)
pound/foot² (lb/ft²)	4.882	kilogram/metre² (kg/m²)	0.205	pound/foot² (lb/ft²)
pound/foot² (lb/ft²)	47.88	Newton/metre² (N/m²)	0.0209	pound/foot² (lb/ft²)
POWER				
Horsepower (hp)	745.7	Watt	0.00134	Horsepower (hp)
foot-pound/minute (ft-lb/min)	0.0226	Watt	44.25	foot-pound/minute (ft-lb/min)

TEMPERATURE

To Convert From	To	Use Formula
Temperature Fahrenheit, °F	Temperature Celsius, °C	°C = (°F - 32) ÷ 1.8
Temperature Celsius, °C	Temperature Fahrenheit, °F	°F = (1.8 x °C) + 32

CHEMICAL RESISTANCE GUIDE

The chemical resistance data presented in this table is based on information from polymer manufacturers and previous Intralox field experience. The data is indicative only for the conditions under which it was collected and should be considered as a recommendation only, not as a guarantee. This data pertains to chemical resistance only, and the temperatures listed are generally the chemical temperatures. Other design and personal safety concerns were not considered in making recommendations. Prudent application engineering dictates that materials and products should be tested under exact intended service conditions to determine their suitability for a particular purpose.

Chemicals listed without a concentration are for the undiluted chemical. Chemicals listed with a concentration are in solution with water. Descriptions in parenthesis are the active ingredient. In general, as the temperature of an application rises, the chemical resistance of a material decreases. Additional information about chemicals and materials of construction not listed may be obtained by contacting Intralox.

MATERIAL SUITABILITY CODE

R = Recommended
NR = Not Recommended
Q = Questionable
— = No Available Information

CHEMICAL NAME	STANDARD MATERIALS								SPECIAL APPLICATIONS MATERIALS					
	Polypropylene		Polyethylene		Acetal		EC Acetal		Heat Resistant Nylon		Impact Resistant Nylon		Flame Retardant Material	
	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)
Acetic Acid	R	R	R	Q	—	—	—	—	NR	NR	NR	NR	R	R
Acetic Acid - 5%	R	R	R	R	R	—	R	—	R	NR	Q	NR	R	R
Acetone	R	R	R	R	Q	Q	Q	Q	R	R	R	R	R	R
Alcohol - All Types	R	R	R	R	—	—	—	—	R	R	R	R	R	R
Alum - All Types	R	R	R	R	—	—	—	—	Q	—	—	—	—	—
Aluminium Compounds	R	R	R	R	—	—	—	—	Q	R	R	R	R	R
Ammonia	R	R	R	R	—	—	—	—	R	R	R	R	—	—
Ammonium Compounds	R	R	R	R	—	—	R	—	Q	R	R	R	R	R
Amyl Acetate	Q	NR	Q	NR	—	—	—	—	R	N	R	N	—	—
Amyl Chloride	NR	NR	Q	NR	—	—	—	—	—	—	—	—	—	—
Aniline	R	R	R	NR	—	Q	—	Q	Q	—	—	—	NR	NR
Aqua Regia	NR	NR	Q	NR	—	—	—	—	—	NR	NR	NR	NR	NR
Arsenic Acid	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Barium Compounds	R	R	R	R	—	—	—	—	R	R	R	R	R	R
Barium Soap Grease	R	Q	—	—	—	—	—	—	—	—	—	—	—	—
Beer	R	R	R	R	—	—	—	—	R	—	—	—	R	R
Benzene	Q	NR	Q	NR	R	Q	R	Q	R	R	R	R	R	R
Benzenesulfonic Acid - 10%	R	R	R	R	—	—	—	—	R	—	—	—	—	—
Benzoic Acid	R	R	R	R	—	—	—	—	R	Q	Q	Q	—	—
Borax	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Boric Acid	R	R	R	R	—	—	—	—	Q	R	R	R	—	—
Brake Fluid	R	R	—	—	R	R	R	R	R	R	R	R	R	R
Brine - 10%	R	R	R	R	R	R	R	R	—	—	—	—	—	—
Bromic Acid	NR	NR	NR	NR	—	—	—	—	—	NR	NR	NR	—	—
Bromine - Liquid or Fumes	NR	NR	NR	NR	—	—	—	—	NR	NR	NR	NR	NR	NR
Bromine Water	NR	NR	—	—	—	—	—	—	NR	NR	NR	NR	—	—
Butyl Acetate	NR	NR	Q	NR	—	—	—	—	R	R	R	R	R	R
Butyl Acrylate	NR	NR	R	Q	—	—	—	—	—	—	—	—	—	—
Butyric Acid	R	—	R	Q	—	—	—	—	Q	R	R	R	—	—
Calcium Compounds	R	R	R	R	—	—	—	—	Q	—	—	—	R	R
Calcium Soap Grease	R	Q	—	—	—	—	—	—	—	—	—	—	—	—
Calgonite - 0.3%	R	R	—	—	R	R	R	R	—	—	—	—	—	—
Carbon Dioxide	R	R	R	R	—	—	—	—	R	R	R	R	R	R
Carbon Disulfide	Q	NR	Q	NR	—	—	—	—	R	R	R	R	—	—
Carbon Tetrachloride	NR	NR	NR	NR	R	Q	R	Q	R	R	R	R	R	R
Cellosolve - TM	R	R	—	—	—	—	—	—	—	—	—	—	—	—

MATERIAL SUITABILITY CODE

R = Recommended
NR = Not Recommended
Q = Questionable
— = No Available Information

(Continued)

CHEMICAL NAME	STANDARD MATERIALS								SPECIAL APPLICATIONS MATERIALS					
	Polypropylene		Polyethylene		Acetal		EC Acetal		Heat Resistant Nylon		Impact Resistant Nylon		Flame Retardant Material	
	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)
Chloracetic Acid	R	R	—	—	—	—	—	—	—	NR	NR	NR	—	—
Chlorine - Gas	NR	NR	Q	NR	NR	NR	NR	NR	—	NR	NR	NR	NR	NR
Chlorine - Liquid	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Chlorine Water (0.4% Cl)	R	Q	R	Q	NR	NR	NR	NR	—	NR	NR	NR	—	—
Chlorobenzene	NR	NR	Q	NR	—	—	—	—	R	R	R	R	NR	NR
Chloroform	NR	NR	NR	NR	—	—	—	—	Q	—	Q	—	R	R
Chlorosulfonic Acid	NR	NR	NR	NR	—	—	—	—	NR	NR	NR	NR	NR	NR
Chromic Acid - 50%	R	R	R	Q	—	—	—	—	NR	—	Q	—	—	—
Citric Acid	R	R	R	R	—	—	—	—	—	R	R	R	R	R
Citric Acid - 10%	R	R	R	R	R	—	R	—	R	R	R	R	R	R
Citrus Juices	R	R	R	R	—	—	—	—	R	R	R	R	R	R
Clorox - TM	R	Q	—	—	NR	NR	NR	NR	—	NR	NR	NR	—	—
Coconut Oil	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Copper Compounds	R	R	R	R	—	—	—	—	Q	—	Q	—	R	R
Corn Oil	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Cottonseed Oil	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Cresol	R	R	R	Q	—	—	—	—	NR	NR	NR	NR	—	—
Cyclohexane	R	Q	NR	NR	—	—	—	—	—	—	R	—	R	R
Cyclohexanol	R	Q	Q	NR	—	—	—	—	R	—	R	—	—	—
Cyclohexanone	R	Q	NR	NR	—	—	—	—	R	—	R	—	—	—
Detergents	R	R	R	R	R	R	R	R	R	—	—	—	—	—
Dextrin	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Dibutyl Phthalate	R	Q	—	—	—	—	—	—	R	R	R	R	R	R
Diethyl Ether	NR	NR	NR	NR	Q	Q	Q	Q	R	R	R	R	—	—
Diethylamine	R	R	—	NR	—	—	—	—	R	—	—	—	—	—
Diglycolic Acid - 30%	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Diisooctyl Phthalate	R	R	—	—	—	—	—	—	—	—	—	—	—	—
Dimethyl Phthalate	R	R	—	—	—	—	—	—	—	—	—	—	—	—
Dimethylamine	R	—	—	—	—	—	—	—	R	R	R	R	—	—
Dioctyl Phthalate	R	Q	—	—	—	—	—	—	R	R	R	R	R	R
Ethyl Acetate	R	R	Q	Q	Q	NR	Q	NR	R	R	R	R	R	R
Ethyl Ether	Q	Q	—	—	—	—	—	—	—	—	—	—	R	R
Ethylamine	R	R	—	—	—	—	—	—	—	—	—	—	—	—
Ethylene Chloride	NR	NR	—	—	—	—	—	—	—	—	—	—	Q	Q
Ethylene Glycol - 50%	R	R	R	R	R	Q	R	Q	R	Q	R	Q	R	R
Ferric / Ferrous Compounds	R	R	R	R	—	—	—	—	Q	—	—	—	—	—
Formaldehyde - 37%	R	R	R	Q	—	—	—	—	—	—	—	—	R	R
Formic Acid - 85%	R	Q	R	R	—	—	—	—	NR	NR	Q	NR	Q	Q
Freon	—	—	R	R	Q	Q	Q	Q	—	—	—	—	R	R
Fuel Oil #2	R	Q	R	NR	Q	Q	Q	Q	R	R	R	R	—	—
Furfural	NR	NR	Q	NR	—	—	—	—	R	—	R	—	—	—
Gasoline	Q	NR	R	NR	R	R	R	R	R	R	R	R	R	R
Glucose	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Glycerol	R	R	—	—	—	—	—	—	R	R	R	R	—	—
Heptane	NR	NR	Q	NR	R	R	R	R	R	R	R	R	R	R
Hexane	R	Q	NR	NR	—	—	—	—	R	R	R	R	R	R
Hydrobromic Acid - 50%	R	R	R	R	—	—	—	—	NR	NR	NR	NR	—	—
Hydrochloric Acid	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	NR	Q	Q
Hydrochloric Acid - 10%	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	NR	Q	Q
Hydrofluoric Acid - 35%	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	NR	—	—
Hydrogen Peroxide - 3%	R	R	R	R	R	R	R	R	Q	Q	Q	Q	R	R
Hydrogen Peroxide - 90%	Q	Q	R	Q	—	—	—	—	NR	NR	NR	NR	R	R
Hydrogen Sulfide	R	R	R	R	—	—	—	—	R	R	R	R	—	—
Hydroiodic Acid	NR	NR	—	—	—	—	—	—	—	—	—	—	—	—

MATERIAL SUITABILITY CODE

R = Recommended
NR = Not Recommended
Q = Questionable
— = No Available Information

(Continued)

CHEMICAL NAME	STANDARD MATERIALS								SPECIAL APPLICATIONS MATERIALS					
	Polypropylene		Polyethylene		Acetal		EC Acetal		Heat Resistant Nylon		Impact Resistant Nylon		Flame Retardant Material	
	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)
Igepal - 50%	R	R	—	—	R	Q	R	Q	—	—	—	—	—	—
Iodine - Crystals	R	R	Q	Q	—	—	—	—	—	NR	NR	NR	—	—
Isooctane	NR	NR	R	—	—	—	—	—	R	R	R	R	—	—
Jet Fuel	Q	NR	Q	Q	R	R	R	R	R	R	R	R	R	R
Kerosene	Q	NR	Q	Q	R	R	R	R	R	—	—	—	R	R
Lactic Acid	R	R	R	R	—	—	—	—	NR	NR	Q	NR	—	—
Lanolin	R	Q	R	R	—	—	—	—	—	—	—	—	—	—
Lard	—	—	R	R	—	—	—	—	—	R	R	R	—	—
Lauric Acid	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Lead Acetate	R	R	R	R	—	—	—	—	R	R	R	R	—	—
Lemon Oil	Q	NR	Q	NR	—	—	—	—	—	—	—	—	—	—
Ligroin	Q	NR	—	—	—	—	—	—	—	—	—	—	—	—
Lime Sulfur	R	—	—	—	—	—	—	—	—	—	—	—	—	—
Linseed Oil	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Lubricating Oil	R	Q	—	—	R	R	R	R	R	Q	R	Q	R	R
Magnesium Compounds	R	R	R	R	—	—	—	—	Q	—	R	—	—	—
Malic Acid - 50%	R	R	R	R	—	—	—	—	R	R	R	R	—	—
Manganese Sulfate	R	—	R	R	—	—	—	—	Q	Q	Q	Q	—	—
Margarine	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Mercuric Compounds	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Mercury	R	R	R	R	—	—	—	—	R	—	R	—	—	—
Methyl Cellosolve	R	—	—	—	—	—	—	—	—	—	—	—	—	—
Methyl Chloride	NR	NR	—	—	—	—	—	—	—	R	R	R	—	—
Methyl Ethyl Ketone	R	Q	NR	NR	—	—	—	—	R	—	R	—	R	R
Methyl Isobutyl Ketone	R	Q	—	—	—	—	—	—	—	—	—	—	—	—
Methylene Chloride	Q	NR	NR	NR	—	—	—	—	Q	Q	Q	Q	NR	NR
Methylsulfuric Acid	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Mineral Oil	Q	NR	R	NR	R	R	R	R	—	—	—	—	R	R
Mineral Spirits	Q	NR	—	—	—	—	—	—	R	—	—	—	—	—
Molasses	R	R	R	R	—	—	—	—	R	R	R	R	—	—
Motor Oil	R	Q	—	—	R	R	R	R	R	R	R	R	R	R
Naphtha	R	Q	Q	NR	—	—	—	—	R	R	R	R	R	R
Nickel Compounds	R	R	R	R	—	—	—	—	Q	—	Q	—	—	—
Nitric Acid - 30%	R	Q	R	R	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Nitric Acid - 50%	Q	NR	R	Q	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Nitric Acid - Fuming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Nitrobenzene	R	Q	NR	NR	—	—	—	—	Q	—	Q	—	NR	NR
Nitrous Acid	Q	NR	—	—	—	—	—	—	—	—	—	—	—	—
Nitrous Oxide	R	—	—	—	—	—	—	—	—	—	—	—	—	—
Oleic Acid	R	NR	—	—	R	R	R	R	R	R	R	R	R	R
Olive Oil	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Oxalic Acid	R	R	R	R	—	—	—	—	Q	—	—	—	—	—
Oxygen	NR	NR	—	—	—	—	—	—	R	R	R	R	—	—
Ozone	NR	NR	Q	NR	—	—	—	—	Q	Q	Q	Q	—	—
Palmitic Acid - 70%	R	R	R	R	—	—	—	—	R	—	R	—	R	R
Peanut Oil	R	R	—	—	—	—	—	—	—	—	R	—	—	—
Perchloric Acid - 20%	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Perchlorothylene	NR	NR	NR	NR	—	—	—	—	Q	NR	Q	NR	—	—
Phathalic Acid - 50%	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Phenol	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Phenol - 5%	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Phosphoric Acid - 30%	R	R	R	R	—	—	—	—	NR	NR	NR	NR	Q	Q
Phosphoric Acid - 85%	R	R	R	R	—	—	—	—	NR	NR	NR	NR	Q	Q
Photographic Solutions	R	R	R	R	—	—	—	—	R	—	R	—	—	—

MATERIAL SUITABILITY CODE

R = Recommended
NR = Not Recommended
Q = Questionable
— = No Available Information

(Continued)

CHEMICAL NAME	STANDARD MATERIALS								SPECIAL APPLICATIONS MATERIALS					
	Polypropylene		Polyethylene		Acetal		EC Acetal		Heat Resistant Nylon		Impact Resistant Nylon		Flame Retardant Material	
	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)	70 °F (21 °C)	140 °F (60 °C)
Plating Solutions	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Potassium Compounds	R	R	R	R	—	—	—	—	R	—	—	—	R	R
Potassium Hydroxide	R	R	R	R	—	—	—	—	R	—	Q	—	R	R
Potassium Iodide (3% Iodine)	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Potassium Permanganate	R	Q	R	R	—	—	—	—	NR	NR	NR	NR	—	—
Silver Cyanide	R	R	—	—	—	—	—	—	—	—	—	—	—	—
Silver Nitrate	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Sodium Compounds	R	R	R	R	—	—	R	R	Q	—	—	—	R	R
Sodium Chlorite	R	Q	R	R	—	—	R	R	Q	NR	NR	NR	R	R
Sodium Hydroxide	R	R	R	R	—	—	R	R	R	NR	NR	NR	Q	Q
Sodium Hydroxide - 60%	R	R	R	R	R	R	R	R	R	NR	NR	NR	Q	Q
Sodium Hypochlorite - (5% Cl)	R	Q	—	—	NR	NR	NR	NR	NR	—	Q	—	R	R
Stannic Chloride	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Stannous Chloride	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Stearic Acid	R	Q	R	R	—	—	—	—	R	R	R	R	—	—
Succinic Acid	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Sugar	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Sulfamic Acid - 20%	R	R	—	—	NR	NR	NR	NR	—	—	—	—	—	—
Sulfate Liquors	R	R	—	—	—	—	—	—	—	—	—	—	—	—
Sulfur	R	R	R	R	—	—	—	—	R	R	R	R	—	—
Sulfur Chloride	R	—	—	—	—	—	—	—	—	—	—	—	—	—
Sulfur Dioxide	R	R	R	R	—	—	—	—	R	Q	Q	Q	R	R
Sulfuric Acid - 3%	R	R	R	R	R	R	R	R	NR	NR	NR	NR	Q	Q
Sulfuric Acid - 50%	R	R	R	R	NR	NR	NR	NR	NR	NR	NR	NR	Q	Q
Sulfuric Acid - 70%	R	Q	R	Q	NR	NR	NR	NR	NR	NR	NR	NR	Q	Q
Sulfuric Acid - Fuming	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	Q	Q
Sulfurous Acid	R	—	R	R	—	—	—	—	Q	Q	Q	Q	—	—
Tallow	R	R	R	Q	—	—	—	—	R	R	R	R	—	—
Tannic Acid - 10%	R	R	R	R	—	—	—	—	—	—	—	—	R	R
Tartaric Acid	R	R	R	R	—	—	—	—	Q	Q	R	Q	—	—
Tetrahydrofuran	Q	NR	—	—	—	—	—	—	R	—	R	—	R	R
Toluene	NR	NR	NR	NR	Q	NR	Q	NR	R	R	R	R	R	R
Tomato Juice	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Transformer Oil	R	Q	R	Q	—	—	—	—	R	R	R	R	—	—
Tributyl Phosphate	R	Q	—	—	—	—	—	—	—	—	—	—	—	—
Trichloroacetic Acid	R	R	—	—	—	—	—	—	R	NR	NR	NR	—	—
Trichloroethylene	NR	NR	NR	NR	—	—	—	—	R	NR	Q	NR	—	—
Tricresyl Phosphate	R	Q	—	—	—	—	—	—	—	—	—	—	—	—
Trisodium Phosphate	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Turpentine	Q	NR	Q	NR	—	—	—	—	R	R	R	R	—	—
Urea	R	R	R	R	—	—	—	—	R	R	R	R	—	—
Vinegar	R	R	R	R	—	—	—	—	—	—	—	—	—	—
Wine	R	R	R	R	—	—	—	—	R	R	R	R	—	—
Xylene	NR	NR	NR	NR	—	—	—	—	R	R	R	R	R	R
Zinc Compounds	R	R	R	R	—	—	—	—	Q	—	Q	—	R	R

MATERIAL SUITABILITY CODE

R = **Recommended**
NR = **Not Recommended**
Q = **Questionable**
— = **No Available Information**

STRAIGHT RUNNING BELT DATA SHEET

Company Name:_____ Phone: _____

Mailing Address:_____ Fax: _____

Shipping Address:_____ Dist. Mgr: _____

City & State: _____ Zip:_____ New Installation: _____

Contact: _____ Title:_____ Retrofit Existing: _____

I. PRODUCT CHARACTERISTICS: Product Being Conveyed

❑	Plastic	❑	Cooked	❑	Frozen	❑	Cardboard	❑	Seasoning	❑	Marinade
❑	Wet	❑	Aluminium	❑	Steel	❑	Sticky	❑	Raw	❑	Sauce
❑	Dry	❑	Slippery	❑	Glass	❑	USDA Req'd	❑	Crumbly		
❑	Fresh	❑	Abrasive	❑	Sharp	❑	FDA Req'd	❑	Other: _____		

❑ Corrosive: Compound _____ Concentration _____ Temperature _____

II. SANITATION:

Method of Cleaning: _____ Frequency: _____

Cleaning Chemicals:_____ Concentration (%): _____

Temperature of Cleaning Media:_____ Time Belt Exposed (Temp):_____

Belt Scrapers:_____ Finger Transfer Plates: _____ Brushes: _____

III. APPLICATION DATA:

Width (in.) _____ Length CL-CL (ft) _____

Product Load (lb/ft^2) _____ Belt Speed (fpm)_____

Sprocket PD 9in)_____ Bore Size (in) _____

Temp @ Drive (deg F)_____ ShaftMaterial_____

Drive Journal Diameter (in)_____

Carryway Conditions:

❑ Wet ❑ Dry ❑ Abrasive

❑ UHMW ❑ HDPE ❑ Nylon

❑ Steel ❑ Other

% of belt backed up with product_____

Push Conveyor?_____

Centre Drive? _____

Frequent Starts? _____

Elevation Change (ft)_____

IV. BELT STYLE: SERIES (Check One)

	100	200	400	600	800	900	1100	1400	1800	2000	2200	2400	3000	4000
Flush Grid	❑	❑	❑			❑	❑				❑	❑		❑
Open Grid		❑				❑								
Raised Rib	❑		❑			❑				❑				
Open Hinge		❑	❑											
Flat Top		❑	❑		❑	❑	❑	❑	❑					❑
Perforated Flat Top		❑			❑	❑	❑							
Multi-Lane				❑										
Diamond Friction Top						❑								
Flat Friction Top						❑		❑						
Frictions Inserts (all Rubber)											❑			
Flush Grid Friction Top							❑					❑		
Mini-Rib					❑									
Non-Skid			❑											
Nub Top					❑									
Cone Top					❑									
Roller Top					❑									
ONEPIECE™ Live Transfer						❑								
Mold-To-Width						❑								
Mesh Top						❑								
Knuckle Chain													❑	

V. BELT MATERIAL

(Check One)

Polypropylene	❑
Polyethylene	❑
Polyacetal	❑
Electrically	❑
FDA Nylon	❑
Non-FDA Nylon	❑
Impact Resistant	❑
Flame Retardant	❑

VI. ADDITIONAL INFORMATION:

Flights (Y/N) _____ Height (in.) _____ Spacing (in) _____

In bulk conveyance, product size: Max _____ Min _____ Average _____

Method of loading: Mechanical _____ Chute _____ Hand _____ Other _____

Other Belt Service Factors (please elaborate) Belt Impact _____ Cutting on Belt _____ Abrasive Environment _____

_____

Product Output Required: Unit _____ /Time _____ /Density _____ lbs/ft^3 _____ /Max. Height (in.) _____

Specification of Current Belt:_____

Other Comments: _____

Fax this page to Intralox Customer Service (+31-206910615) for a free analysis of your design.
Use the back of this page to include a sketch or additional notes.

RADIUS BELT DATA SHEET

Company Name: _____ Phone: _____
Mailing Address: _____ Fax: _____
Shipping Address: _____ Dist. Mgr: _____
City & State: _____ Zip: _____ New Installation: _____
Contact: _____ Title: _____ Retrofit Existing: _____

I. APPLICATION DATA: Product Being Conveyed: _____

Number of Turns? (4 max) _____

Length of Straight Run #1 (m) _____
Inside Radius of Turn #1 (mm) _____
What is the Turn Angle in Degrees of Turn #1 _____
Turn Direction of Turn #1 (right or left) _____

Length of Straight Run #2 (m) _____
Inside Radius of Turn #2 (mm) _____
What is the Turn Angle in Degrees of Turn #2 _____
Turn Direction of Turn #2 (right or left) _____

Length of Straight Run #3 (m) _____
Inside Radius of Turn #3 (mm) _____
What is the Turn Angle in Degrees of Turn #3 _____
Turn Direction of Turn #3 (right or left) _____

Length of Straight Run #4 (m) _____
Inside Radius of Turn #4 (mm) _____
What is the Turn Angle in Degrees of Turn #4 _____
Turn Direction of Turn #4 (right or left) _____

Length of Final Straight Run (m) _____

Belt Width (mm) _____ Belt Material: _____
Carryway Material (UHMW or Steel) _____
Turn Rail Material (UHMW, steel or roller) _____
Does Product Back Up On Belt? _____ % of Belt Backed Up _____
Belt Speed (m/min) _____ Belt Loading (kg/m²) on Conveyor _____
Elevation Change (m) _____ Incline _____ Decline _____
Where: _____
Operating Temp _____ Product Temp (at infeed) _____
Product Size _____ Product Wt/Piece _____ _____ Pcs/m² _____

Sketch/Notes

(Indicate Drive Location)

PRODUCT CHARACTERISTICS

❑	Plastic	❑	Cardboard	❑	Wet
❑	Aluminum	❑	Glass	❑	Fresh
❑	Steel	❑	Sauce	❑	Slippery
		❑	Frozen	❑	Abrasive
		❑	Marinade	❑	Seasoning
		❑	Cooked	❑	Raw
		❑	Dry	❑	Crumbly
		❑	Corrosive	❑	Sticky
		❑	USDA Req'd	❑	Sharp

II. SANITATION:

Method of Cleaning: _____ Frequency: _____
Cleaning Chemicals: _____ Concentration (%): _____
Temperature of Cleaning Media: _____ Time Belt Exposed (Temp): _____
Belt Scrapers: _____ Finger Transfer Plates: _____ Brushes: _____

Fax this page to Intralox Customer Service (+31-206910615) for a free analysis of your design using ***Series 2200 Radius Belt, Series 2400, Series 3000 Turning, Series 4009 or Series 4014 belts****.*

SPIRAL BELT DATA SHEET

Company Name: _____ Phone: _____
Mailing Address: _____ Fax: _____
Shipping Address: _____ Dist. Mgr: _____
City & State: _____ Zip: _____ New Installation: _____
Contact: _____ Title: _____ Retrofit Existing: _____

I. APPLICATION DATA: Product Being Conveyed:

Purpose of Spiral: _____
Product: _____
Spiral Temperature: _____
Belt Width (in.): _____
Actual Cage Radius (in.) from Spiral to Inside of Belt Edge: _____
Tier Spacing (in.): _____
Number of Tiers: _____
Additional Belt Length (including all belt not driven by spiral cage, i.e., infeed length, discharge length, and length through the overdrive and take up systems) (ft):
_____
Belt Speed (ft./min.): _____
Product Weight (# / ft^2 on belt): _____

PRODUCT CHARACTERISTICS

❑	Dry	❑	Wet
❑	Frozen	❑	Fresh
❑	Sauce	❑	Slippery
❑	Breaded	❑	Abrasive
❑	Battered		
❑	Marinade	❑	Seasoning
❑	Cooked	❑	Raw
		❑	Crumbly
❑	Corrosive	❑	Sticky
❑	USDA Req'd	❑	Sharp

II. SPIRAL DATA:

Spiral System Manufacturer: _____
Is Spiral Up or Down: _____ Current Belt Employed: _____ _____
Wearstrip Material: _____ Method of Loading Belt: _____
Spacing of Carryway Wearstrips: _____
Number of Wearstrips: _____
Cage Bar Surface Material (U.H.M.W., Steel, etc.): _____ Cage Bar Width: _____ Spacing: _____
Clearance Between Wearstrip Surface and the Bottom of the Next Tier Wearstrip Support: _____
Does Belt Turn Right or Left onto Spiral Cage: _____
Gravity Take-up Weight: _____ Gravity Take-up Movement/Stroke: _____
Overdrive Speed Control Type (Mechanical, Electrical): _____
Overdrive Shaft Size: _____ Journal Diameter: _____
Idler Roller Diameters: _____ _____ Size: _____
Overdrive Type (Drives on Top or Bottom of Belt): _____
Type of Return Rail for Spiral Radius Belt Return (bull wheel, UHMW guide, rollers, etc.): _____

III. SANITATION:

Method of Cleaning: _____ Frequency: _____
Cleaning Chemicals: _____ Concentration (%): _____
Temperature of Cleaning Media: _____ Time Belt Exposed (Temp): _____
Belt Scrapers: _____ Finger Transfer Plates: _____ Brushes: _____

Fax this page to Intralox Customer Service (+31-206910615) for a free analysis of your design.

A

ACCUMULATION TABLES: Conveyors that absorb temporary product overflows due to fluctuations in downstream operations. They may be uni-directional or bi-directional.

ACETAL: A thermoplastic that is strong, has a good balance of mechanical and chemical properties, and has good fatigue endurance and resilience. It has a low coefficient of friction. Temperature range is from -50 °F (-45 °C) to +200 °F (93 °C). Its specific gravity is approximately 1.40.

ADJUSTED BELT PULL: The belt pull adjusted for Service Factors.

ALLOWABLE BELT STRENGTH: The rated belt strength adjusted for Temperature and Strength Factors.

B

BELT PITCH: Centre distance between hinge rods in an assembled belt.

BELT PULL: The tensile load on a belt after the product loading, belt weight, conveyor length, total friction factor and elevation change is applied.

BRICKLAYED: Belt construction where plastic modules are staggered with those in adjacent rows.

C

CATENARY SAG: A belt or chain hanging under the influence of gravity between two (2) supports will assume the shape of a curve called a “catenary”.

CENTER-DRIVEN BELTS: Belts driven by the sprocket at a point midway between the hinge rods.

CHEVRON CARRYWAYS: Support rails which are placed in an overlapping “V” pattern. This array supports the conveyor belt across the full width while distributing the wear more evenly. This pattern is very effective when moderate abrasion is present, providing a self cleaning method.

CHORDAL ACTION: The pivoting action of the belt’s modules about their hinge rods as the modules engage and disengage the sprocket. This results in a pulsation in the belt’s speed, and a rise and fall in the belt’s surface.

COEFFICIENTS OF FRICTION: A ratio of frictional force to contact force, which is determined experimentally. Coefficients of friction are usually stated for both dry and lubricated surfaces, and for start-up and running conditions.

D

DEAD PLATE GAP: Gap or clearance between the surface of a conveyor belt and any other surface onto which products or containers being conveyed are to be transferred.

DEFLECTION: Displacement or deformation due to loading.

E

ELEVATING CONVEYORS: These conveyors have several types of variations and are employed when product elevation is necessary. Elevators almost always employ flights and sideguards, which present special consideration in the design.

EXTRA-WIDE SPROCKETS: Available only in a **Series 200**, hinge-driven, 6.4 in. (163 mm) diameter sprocket. Provides an extra-wide (double) driving area.

F

F.D.A. Food and Drug Administration. Federal agency which regulates materials that may come in contact with food products.

FINGER TRANSFER PLATES: Comb-like plates that are employed with Intralox Raised Rib belts to minimize problems with product transfer and tipping.

FLAT PLATE CARRYWAYS: These are continuous sheets, usually of metal, over which the belt slides.

FLAT TOP STYLE: Modular plastic belt with a smooth, closed surface.

FLIGHTS: A vertical surface across the width of the belt. An integral part of the Intralox belt, employed where elevation of product is required (*e.g., Incline Conveyors, Elevator Conveyors*).

FLUID COUPLINGS: A device which allows the driven conveyor to accelerate gradually to operating speeds. Fluid couplings are recommended when frequent starts and stops of high speed or heavily loaded conveyors occur, and they also serve as an overload safety.

FLUSH GRID STYLE: Modular plastic belt with a smooth, open grid.

FRICTION: The force which acts between two bodies at their surface of contact, so as to resist their sliding on each other (*see Coefficients of Friction*).

G

GRAVITY TAKE-UP: Usually consists of a roller resting on the belt in the returnway, its weight providing the tension needed to maintain proper sprocket engagement. It is most effective when placed near the drive shaft end of the returnway.

H

H.D.P.E. High Density Polyethylene resin used in the manufacture of wearstrip. Employed, where abrasion is not a problem, to reduce friction between belt and the carryway surface.

HINGE-DRIVEN BELTS: Belts driven at the hinges by the sprocket.

HINGE RODS: Plastic rods that are used in the assembly of modular plastic belts. They also serve as the hinges around which the belt modules rotate.

HORSEPOWER:

English (USA) Units — The power delivered by a machine while doing work at the rate of 550 foot pounds per second (ft-lb/sec), or 33,000 foot pounds per minute (ft-lb/min). The watt and kilowatt are power units used in rating electrical equipment. One kilowatt is equal to 1,000 watts. One horsepower equals 746 watts or 0.746 kilowatts. One kilowatt (kW) is equal to 1.341 horsepower.

Metric Units — The power delivered by a machine while doing work at the rate of 75 kilogram-meters per second (kg-m/sec), or 4500 kilogram-meters per minute (kg-m/min). One kilowatt (kW) is equal to 1.359 metric horsepower. One metric horsepower equals 736 watts or 0.736 kilowatts and closely approximates one English (USA) Horsepower, 746 watts.

Where calculations in this manual are done in metric units, power calculations are computed in Watts. Wherever Horsepower (HP) is used, it refers to the English (USA) value.

I-K

IDLER ROLLERS: Steel or plastic pipes that are supported by stub shafts used in place of idle shafts and sprockets. These pipe rollers may be considerably stiffer than a length of solid square shaft of comparable weight.

INERTIA: The tendency of a body to remain at rest or to stay in motion, unless acted upon by an outside force.

INTERMEDIATE BEARINGS: An additional bearing (or bearings) located near the centre of a shaft to reduce shaft deflection to an acceptable level.

KNUCKLE CHAIN: Narrow chain with relatively high strength that is commonly used in multiple strand applications. Knuckle Chain typically handles boxes, totes, pans or other large products.

L

LOAD-BEARING ROLLERS: Steel or plastic pipes supported by stub shafts which provide stiffness. Employed on centre-drive Accumulation Conveyors on either side of the drive shaft.

M

MODULAR CONSTRUCTION: Injection-moulded plastic modules assembled into an interlocked unit and joined together by hinge rods.

MODULE PITCH: The distance between the rod hole centrelines on a module.

MODULES: Injection-moulded plastic parts used in the assembly of an Intralox belt.

MOLYBDENUM-FILLED NYLON (NYLATRON): A type of wearstrip plastic.

MOMENT OF INERTIA: A characteristic of the shape of an object which describes its resistance to bending or twisting.

N

NYLATRON: *(see Molybdenum-filled Nylon)*.

O

ONEPIECE™ LIVE TRANSFER BELT: Modular plastic belt with an integral transfer edge for smooth, self-clearing, right angle transfers onto takeaway belts.

OPEN AREA: The percentage of area in the plane of the plastic belt that is unobstructed by plastic.

OPEN GRID STYLE: Modular plastic belt with low profile, transverse ribs.

OPEN HINGE STYLE: Modular plastic belt with exposed hinge rods and a flush surface.

OUTSIDE DIAMETER: The distance from the top of a sprocket tooth to the top of the opposite tooth, measured through the centerline of the sprocket.

P-Q

PARALLEL CARRYWAYS: Belt support rails that may be either metal or plastic, placed on the conveyor frame parallel to the belt's travel.

PERFORATED FLAT TOP STYLE: Modular plastic belt with a smooth, perforated top.

PITCH: *(see Belt Pitch or Module Pitch)*.

PITCH DIAMETER: Diameter of a circle, which passes through the centrelines of hinge rods, when the belt is wrapped around a sprocket.

POLYACETAL: *(see Acetal)*.

POLYETHYLENE: A lightweight thermoplastic, buoyant in water, with a specific gravity of 0.95. It is characterized by superior fatigue resistance, flexibility and high-impact strength. Exhibits excellent performance at low temperatures, -100 °F (-73 °C). Upper continuous temperature limit is +150 °F (+66 °C).

POLYPROPYLENE: A thermoplastic material that provides good chemical resistance characteristics. Polypropylene is buoyant in water, with a specific gravity of approximately 0.90. It is suitable for continuous service in temperatures from +34 °F (+1 °C) to +220 °F (+104 °C).

PULL-PULL BI-DIRECTIONAL CONVEYORS: There are three common variations of the Pull-pull type of reversing (bi-directional) conveyors: the Centre-Drive method, the Two-Motor drive method, and the Single-Motor/Slave-Drive method.

PUSH-PULL BI-DIRECTIONAL CONVEYORS: A conveyor employing one motor that will be reversing (bi-directional). In one direction the belt is being pulled and in the reversing direction the belt is being pushed.

PUSHER BAR: A device used on bi-directional accumulation tables *(i.e., in the bottling and canning industries)* which allows the table to be filled to its capacity and assists in an orderly and complete discharge from the table back onto the conveying line.

R

RAISED RIB STYLE: Modular plastic belt with a high profile, longitudinally ribbed surface.

RETAINER RINGS: A shaft and sprocket accessory which restricts the lateral movement of the sprocket with respect to the shaft.

RETURNWAYS: The path the belt follows toward the idler shaft and sprockets.

RODS: *(see Hinge Rods)*.

ROLLER CARRYWAYS: Carryway surface that does not provide a continuous running surface. The chordal action, as the modules pass over the rollers, may cause problems if product tippage is critical.

S

SCREW TAKE-UP: These types of take-ups shift the position of one of the shafts, usually the idler, through the use of adjustable machine screws.

SCROLL: Device used in place of the idle shaft and sprockets to prevent debris from accumulating on the inside of the conveyor belt. Scrolls are fabricated by welding steel left hand pitch and right hand pitch helical ribs to a common round shaft.

SERVICE FACTORS: Driven machines and power sources may be classified by severity factors, which reflect the type of service placed upon the power transmission components. High service factors are assigned to more severe applications, thereby providing sufficient component strength to render an acceptable life expectancy for that component. Additional service factors may be required for continuous service applications requiring braking *(e.g., starts/stops)* or reversing action *(e.g., bidirectional accumulation tables)*. Service factors help to insure optimal service life of the components.

SIDEGUARDS: Intralox belt accessory which forms a vertical wall near the belt edge and is an integral part of the belt.

SINGLE-MOTOR/SLAVE-DRIVE: Employing one motor (reversible) using a roller chain, alternately driving either of two chain sprockets on the conveyor shaft. This drive system is usually limited to short conveyors because of the length of roller chain involved.

SOFT START MOTORS: When rapid starts and stops of high speed and loaded conveyors occur, these devices are recommended. They allow the driven conveyor to accelerate gradually to operating speeds, which is beneficial for all conveyor components.

SPECIFIC GRAVITY: A dimensionless ratio of the density of a substance to the density of water.

STATIC ELECTRICITY: An electrical charge build-up on a surface as a result of rolling or sliding contact with another surface.

T

TAKE-UP UNITS: *(see Gravity or Screw Take-Up)*.

THERMAL EXPANSION/CONTRACTION: With few exceptions, the dimensions of all substances increase as their temperature is increased and contract as their temperature is decreased. Plastics expand and contract rather significantly.

TORQUE: The capability or tendency of a force for producing torsion or rotation about an axis. For example, the twisting action on a turning shaft.

TWO-MOTOR DRIVE DESIGN: In this design, the belt is alternately pulled in either direction *(e.g., bi-directional accumulation tables)*. Returnway belt tension is relatively low, requires rather expensive additional hardware *(e.g., an additional motor)*, slip clutches and electrical control components.

U-V

U.H.M.W. Ultra High Molecular Weight, polyethylene resin used in the manufacture of wearstrip. It has very good wear characteristics, impact resistance and has an excellent combination of physical and mechanical.

U.S.D.A. United States Department of Agriculture. Federal agency which regulates equipment that may be employed in Meat, Dairy and Poultry facilities.

W-Z

WEARSTRIP: Plastic strips that are added to a conveyor frame to increase the useful life of the frame and the conveyor belting. Also helpful in reducing sliding friction forces.

A

Abrasion Resistance Hinge Rods 2-103
Abrasion Resistance System 2-102
Abrasion Resistant (Ar) Sprockets 2-26, 2-102
Accessories 2-4, 2-79, 2-83, 2-87
Accumulation Tables 4-27
Acetal 1-5, 2-2, 2-5, 4-27
  electrically Conductive (Ec) 1-5, 2-2
Adjusted Belt Pull 4-3, 4-27
Agency Acceptability 2-4
Agency Compliance By Material 2-5
Allowable Belt Strength 2-8, 4-27
Ambient Conditions 3-8
Analysis for sideflexing belts 1-9
Angle and clip-on wearstrips 3-6
Anti-Sag Carryway Wearstrip Configuration 3-7

B

Back Tension 3-8
Basic Conveyor Frame Requirements 3-2
Bearing Journals *(see Shaft)* 2-95
  Intermediate Bearings 3-6
Belt
  Accessories 2-13, 2-21, 2-30, 2-42, 2-59, 2-67, 2-76, 2-79, 2-83, 2-87, 2-90, 2-94
  Carryways 3-6
  Construction 1-4
  Length, Accommodating Changes 2-97, 2-100
  Selection 2-7
  Style
    Cone Top 1-7
    Flat Top 1-6, 2-101
    Flush Grid 1-6, 2-101
    Knuckle Chain 1-5, 1-8
    Mini Rib 1-7
    Mould To Width 1-8
    Nub Top 1-7
    Onepiece™ Live Transfer 1-8
    Open Grid 2-101
    Perforated Flat Top 1-6, 2-101
    Raised Rib 1-6, 2-100
    Roller Top 1-7
    Textured Flat Top 1-7
  Weight 2-100
Belt Accessories 2-1
Belt Carryways 3-6
Belt Data 2-1
Belt Material Properties 2-3
Belt Pitch 4-27
Belt Pull 4-27
Belt Selection Instructions 2-7
Belt Selection Process 1-5
Belt specifications 2-4
Belt Speed 1-9
Belt Strength 4-3
Belt Style And Material Availability 2-4
Belt Surface Wear 1-9
Bi-Directional Conveyors 3-11
Bricklayed 4-27

C

Calculating Belt Pull or Tension Load 4-2
Carryway *(see Wearstrip)*
  Anti-Sag Carryway Wearstrip Configurations 3-7
  Roller 2-101, 3-5
  Solid Plate 3-6
  Wearstrip ..... 2-99 to 2-100, 3-6 to 3-7
Catenary 3-13
Catenary Sag 3-8, 4-5, 4-27
Center-driven Belts 4-27
Chain Products 1-8
Chemical Resistance 2-2, 3-7
Chemical Resistance Guide 4-16
Chevron Array 3-7
Chevron Carryways 4-27
Chordal Action 1-9, 4-27
Coefficient of Friction 4-2, 4-27
  Running 3-6
Cone Top 1-7, 2-38
Confirmation of Shaft Strength 4-3
90° Container Transfers 3-19
Control of Belt Length 3-8
Conveyor Frame Dimensions 3-3
Conveyors, Special 2-5, 3-11
  Bi-directional ..... 3-8, 3-11 to 3-12
    Pull-Pull 3-11
    Pull-Pull, Centre-Drive 3-11
    Pull-Pull, Single-Motor and Slave-Drive 3-11
    Pull-Pull, Two-Motor Drive 3-11
    Push-Pull ..... 3-11 to 3-12
  Elevating ..... 2-101, 3-13 to 3-15
Corner tracks 2-94
Custom Wearstrips 2-99

D

Dead Plate ..... 2-100, 3-18 to 3-19
Dead Plate Gap 3-18, 4-27
Deflection 4-3, 4-27
Design Guidelines 3-1
Design Requirements 1-4
DFT and FFT 1-7
Diamond Friction Top 2-55
Diamond Friction Top Ultra 2-55
Dimension Definitions 3-2
Drive Guidelines 3-4
Drive Method ..... 1-4 to 1-5
Drive Shaft *(see Shaft)*
  Span 2-8
  Torque Loading 3-4
Drive Shaft Torque 4-4
Dynamic Effects Of High Speed Operation 1-9

E

Electrically Conductive (EC) Acetal 1-5, 2-2
Elevating Conveyors 3-13, 4-27
Elongation (strain) under load 3-8
Elongation due to break-in and wear 3-8
End-off/End-on Transfers 3-17
Expansion Due to Water Absorption .. 2-2, 2-103, 3-20
Extended Flights 2-100
Extended Pins 2-90
Extended Tabs 2-90
Extra-wide Sprockets 4-27
EZ Clean Sprocket 2-99

F

FDA 2-2, 2-4, 4-27
Finger Transfer Plates 2-13, 2-31, 2-59, 2-79, 4-27
Flame Retardant Thermoplastic Polyester (FR-TPES) 1-5, 2-2
Flat Finger-Joint Wearstrips 2-98, 3-6
Flat Friction Top 2-56, 2-72
Flat Friction Top Ultra 2-56
FLAT PLATE CARRYWAYS 4-27
Flat Top 2-101
  0% Open Area 2-18, 2-26, 2-33, 2-50, 2-62, 2-69, 2-75
Flat Top Style 4-27
Flat Top Surface 1-6
Flat Wearstrips 2-98
Flight Material 2-97
Flights . 2-13, 2-21, 2-30, 2-42, 2-59, 2-67, 2-76, 2-83, 4-27
  Bucket 2-42
  Impact Resistant 2-42, 2-76
  No-Cling 2-21, 2-42
  Nub Top™ 2-42
  Ribbed 2-21
  Scoop 2-42
  Streamline 2-21, 2-30, 2-42, 2-59, 2-83
  Streamline/No-cling 2-13, 2-30, 2-59
Fluid Couplings 4-27
Flush Grid 1-6, 2-26, 2-101
  17% Open Area 2-23
  2.2 RADIUS 2-85
  28% Open Area 2-61
  31% Open Area 2-9
  33% Open Area 2-16
  38% Open Area 2-46
  50% Open Area 2-81
  friction top
    28% Open Area 2-64
Flush Grid Style 4-27
Formulas 4-2
Friction 4-27
Friction Factors 2-3
Friction Modules 2-83, 2-87, 3-15
FR-TPES 1-5, 2-2

G

General Application Sprocket Material 2-5
General Purpose Materials 2-6
Glass Filled Nylon 2-6
Glossary 4-27
Gravity Take-Up 4-27

H

HDPE 1-9, 4-27
Heat Resistant (HR) Nylon 1-5, 2-3
Hinge Rods 4-27
Hinge-Driven Belts 4-27
Hold Down Guides 2-87
Hold Down Rail 2-101
Hold Down Roller 2-101, 3-15
Horsepower 4-28

I

Idler Rollers 4-28
Impact Resistant (IR) Nylon 1-5, 2-2
Inertia 4-28
Injection-Moulded Plastic 1-4
Intermediate Bearings 3-5, 4-28
Intraflex™ 2000 ..... 1-5, 2-78
Intraflex™ 2000 Raised Rib 1-5

J

Journal Bearing, Split 2-102

K

Keyway 2-95
Knuckle Chain 2-89, 4-28
  Series 3000 2-89

L

Load-Bearing Rollers 4-28
Low Coefficient of Friction 2-2

M

Materials
  Aluminum 1-9
  Carbon Steel 1-9, 2-100
  Electrically Conductive (EC) 1-5, 2-2
  Flame Retardant 1-5, 2-2
  Nylon 2-2
    Heat Resistant (HR) 1-5, 2-3

Impact Resistant (IR) 1-5, 2-2
Polyethylene 1-5, 2-2
Polypropylene 1-5, 2-2, 2-5, 2-101
Polysulfone 2-96
Stainless Steel 1-9, 2-6, 2-100
UHMW ..... 2-99 to 2-100
Maximum Shaft Span Length 4-14
Measurement Conversion Factors 4-15
Mechanical Efficiency 3-4
Mesh Top
24% Open Area 2-54
Mini Rib 1-7, 2-36
Modular Construction 1-4, 4-28
Module Pitch 4-28
Modules 4-28
Modulus of Elasticity 4-3
Molybdenum-filled Nylon (Nylatron) 4-28
Moment of Inertia 2-8, 4-3, 4-28
Mould To Width 1-8, 2-47, 2-51, 2-70

N

Nylatron 4-28
Nylon 1-5, 2-2
Heat Resistant (HR) 1-5, 2-3
Impact Resistant (IR) 1-5, 2-2

O

Onepiece™ Live Transfer 1-8, 2-48, 2-52, 2-71
Onepiece™ Live Transfer Belt 4-28
Open Area 4-28
Open Grid
33% Open Area 2-15
38% Open Area 2-45
Open Grid Style 4-28
Open Grid Surface 1-7, 2-101
Open Hinge 2-25, 2-101
45% Open Area 2-17
Open Hinge Style 4-28
Open Hinge Surface 1-7
Operating Temperature 2-3
Outside Diameter 4-28

P

Parallel Carryways 4-28
Perforated Flat Top 2-19, 2-35, 2-53
12% Open Area 2-19
18% Open Area 2-34
3.2% Open Area 2-63
Perforated Flat Top Style 4-28
Perforated Flat Top Surface 1-6
Pitch 1-5, 4-28
Pitch Diameter 4-28
Polyacetal 4-28
Polyethylene 1-5, 2-2, 2-6, 4-28
Polypropylene 1-5, 2-2, 2-5, 2-101, 4-28
Polysulfone 2-96
Polyurethane 2-5
Power Requirements 3-5
Product Line 2-1
Product Transfer
90° Container Transfers 3-19
Dead Plate ..... 2-100, 3-18 to 3-19
Onepiece™ Live Transfer 1-8, 3-19
Pull-Pull 3-11
Pull-Pull Bi-directional Conveyors 4-28
Pull-Pull designs 3-11
Pusher Bar 2-100, 4-28
Push-Pull 3-11
Push-Pull Bi-directional Conveyors 4-28

R

Radius Belt Data Sheet 23
2.2 Radius Flush Grid 2-85
Raised Rib 2-24, 2-49, 2-77
Raised Rib Style 4-29
Raised Rib Surface 1-6, 2-100
Rated Belt Strength 4-3
Requirements
Basic Conveyor Frame 3-2
Retainer Rings 2-96, 4-29
Heavy Duty 2-96
Self-Set 2-96
Steel 2-96, 2-100
Retaining Sprockets 3-5
Returnway
Required Tension 3-8
Returnways 4-29
Returnways and Take-Ups 3-8
RODS 4-29
Roller Carryways 4-29
Roller returnways 3-9
Roller Top
3% Open Area 2-39
Rollers 2-101
Hold Down 2-99, 2-101, 3-13, 3-15
Nosebar 3-16
Rollers as Carryways 3-7
Rollers as Idle Shafts and Sprocket Replacements 3-6
Running Surface 3-6

S

Sample Problems 4-5
Screw Take-up 3-10, 4-29
Scroll 4-29
Scroll Idlers 2-97
Series 100 ..... 1-6, 2-2, 2-9, 2-11, 2-13, 2-100
Series 200 1-6 to 1-7, 2-15 to 2-16, 2-20 to 2-21, 2-101
Series 400 ..... 1-6 to 1-7, 2-2, 2-23, 2-26, 2-28, 2-100 to 2-101
Series 800 ..... 1-6 to 1-7, 2-2, 2-33, 2-35, 2-40, 2-101
Series 900 ..... 1-6 to 1-8, 2-2 to 2-4, 2-45, 2-57, 2-59, 2-100

Series 1100 ..... 1-6 to 1-7, 2-2, 2-61, 2-65 to 2-66
Flush Grid ..... 2-2 to 2-3
Series 1400 ..... 1-6 to 1-8, 2-69, 2-71 to 2-73
Flat Top 1-8
Series 1800 ..... 1-6, 2-75 to 2-76
Series 2000, Intraflex™ 1-6, 2-77, 2-80
Wearstrip 2-99
Series 2200 ..... 1-6 to 1-7, 2-81 to 2-84
Flush Grid 1-5
Series 2400 ..... 2-85, 2-87 to 2-88
Friction 1-7
Series 2400 2.2 1-6
Series 3000 ..... 1-8, 2-6, 2-89 to 2-90
Knuckle Chain 2-89
Turning Knuckle Chain 1-5
Series 4000 2-91
Flat Top 1-8
Flush Grid 1-8
Service Duty 1-9
Service Factor 2-8, 4-11, 4-29
Shaft ..... 2-8, 2-100 to 2-101
Deflection 2-8
Dimensions and Tolerances 2-95
Maximum Allowable Torque 1-10
Sizes and Materials 3-4
Tolerances 2-95
Shaft Data 2-8
Shaft Deflection 2-8, 4-3
Shaft Strength 1-10
Shoes ..... 2-100 to 2-101, 3-13
Sideflexing Conveyors 3-16
Sideguards 2-13, 2-21, 2-31, 2-43, 2-59, 2-67, 4-29
Single-motor/slave-drive 4-29
Slide Bed 3-9
Sliderbed returnways 3-9
“Slip-Stick” Effect 3-20
Soft Start Motors 4-29
Soft Starting Motors and Fluid Couplings 3-6
Solid Plate Carryways 3-6
span-to-sag ratio 3-8
Special Application Belt Materials 2-2
Special Application Materials 2-4, 2-6
Special Application Sprocket Material 2-5
Special Conveyors 3-11
Special Design Guidelines 3-20
Special Take-Up Arrangements 3-10
Specific Added Belt Pull 3-19
Specific Gravity 2-3, 4-29
Spiral Belt Data Sheet 25
Split Sprockets 2-102
Sprocket ..... 2-101 to 2-102
Bore 2-6
EZ Clean 2-99
Float 1-4
Retaining 2-103, 3-5
Spacing 2-101, 3-15
Sprocket & Shaft Data ... 2-11, 2-20, 2-28, 2-40, 2-57, 2-65, 2-73, 2-76, 2-78, 2-82, 2-86, 2-90, 2-94
Sprocket and Support Quantity Reference 2-28, 2-40, 2-57, 2-65, 2-73, 2-76, 2-78, 2-82, 2-86, 4-11
Sprocket Material Availability 2-6
Square Shaft *(see also Shaft)* 2-95, 2-101
Stainless Steel 2-6
Stainless Steel Retaining Rings 2-96
Standard Belt Materials 2-2
Standard Flat Wearstrips 2-98, 3-6
Standard Materials 2-4
Standard Retainer Rings 2-96
Standard Returnways 3-9
Static Electricity 1-10, 4-29
Steel, Stainless 1-9, 2-6, 2-100
Straight Running Belt Data Sheet 21
Straight, parallel runners 3-6
Surface Finishes 2-95
Symbols Used 4-1

T

Tables 4-9
Take-Up
Gravity Style 3-10
Screw Style 3-10
Take-Up Units 4-29
Temperature 2-3
Effects 3-17
Factor 2-3
Limits 3-7
Variations 3-8
Temperature and Strength Factors 4-3
Temperature Factor 4-12
Temperature Factor Tables 2-3
Textured Flat Top 1-7
Thermal Expansion and Contraction 3-7, 3-20, 4-29
Thermoplastic 1-5, 2-2
Tolerances 2-95
Torque 2-8, 4-29
Total Shaft Load 4-4
Transfer Design Guidelines 3-17
Two-Motor Drive Design 4-29
Typical Shaft Features 3-4

U

UHMW ..... 1-9, 2-99 to 2-100, 4-29
USDA 2-4, 4-29
USDA Dairy 2-4
Use of Round Shaft 3-5

V

Vacuum Transfer Applications 3-19

W

Wearstrips 1-10, 2-98, 4-29
Angle 2-99, 3-6, 3-16
Carryways 3-6
Chevron Array 3-7
Clip-On 2-100, 3-6
Design Considerations 3-7
Flat Finger-Joint 2-98, 3-6
Installation 3-7
Parallel Runners 3-6
Snap-On 3-6
Standard Flat 3-6
Types and Sizes 3-6