Miniature Couplings

Mini Flexible Couplings — Four Designs

The Lovejoy Miniature flexible couplings have proven to be particularly suitable in all light duty and precision applications. The design objective of a Miniature flexible coupling is to transmit torque loads without permanent distortion or damage and without imposing undue bending or radial loads upon the driver or driven components. The specific characteristics of each application determine the proper flexible coupling to use.

Typical operational requirements for Miniature flexible couplings include light duty, torque ratings less than 50 in-lbs., torsional rigidity, low inertia, constant velocity, low radial stiffness, zero backlash, corrosion resistance and the capability of cyclic (repeated start/stop/reverse) activity. Applications that normally use Miniature flexible couplings have a fractional electrical motor driver, such as shaft encoders, resolvers, all forms of servo devices, linear and ball screw actuators, robots, stepmotors, light duty pumps and metering devices, plotters, positioning tables, computers and radar.

BEAM COUPLING

OLDHAM COUPLING

MINI SOFT COUPLING

JAW TYPE COUPLING

Beam Coupling

The Lovejoy Beam Miniature coupling is formed from one piece of aluminum rod, resulting in a truly flexible coupling that transmits torque through the flexure while accommodating angular, parallel and axial misalignment.

- High temperature applications
- Zero backlash
- Low reactionary loads on bearings
- No wear parts
- Good chemical resistance
- Constant velocity
- Lightweight

Oldham Coupling

The Lovejoy Oldham coupling is a precision-engineered, torsionally stiff, three-part coupling suitable for a great many applications ranging from incremental control of fluid valves to highly dynamic drives in a closed loop servo system. It accommodates misalignment mechanically through a floating disc that engages tenons machined out of the hubs.

- Positive engagement
- Good torque overload capacity
- Good parallel misalignment capacity
- Vibration damping ability
- Easy to install
- Raised dots on the spacer sets the gap between the hubs

Mini Soft Coupling

The Mini Soft Miniature coupling from Lovejoy provides protection from misalignment, vibration and shock loads. The simple design of the coupling ensures ease of assembly, installation and reliable performance. No special tools are needed for installation or removal. No lubrication is needed and once installed and aligned correctly, no maintenance is required.

- Multiple tooth contact, low load per tooth
- Good axial freedom
- Good damping capacity
- Good torsional stiffness
- Electrical isolation
- High speed capability

Jaw Type Coupling

The interlocking jaws of the three part Lovejoy Miniature Jaw coupling provide positive engagement resulting in great strength because of the large area of contact of the elastomer with the jaws. This Miniature coupling provides “fail safe” operations and is the only coupling that will continue to run even if the elastomer center fails, through the metal to metal jaw contact that will continue to transmit torque.

⚠ WARNING

You must refer to page iv for Important Safety Instructions and Precautions for the selection and use of these products. Failure to follow the instructions and precautions can result in severe injury or death.

Miniature Coupling Selection Process

The selection process for determining the proper Miniature coupling starts with selecting the coupling design that best addresses the application requirements. The Coupling Comparison chart (M-4) provides a method of weighing performance characteristics of the **Beam, Oldham, Mini Soft, and Jaw** couplings and determining the coupling design with the best potential for fulfilling the requirements. Once a design is selected, the proper size must be determined based on the capabilities of the particular design.

In the Beam coupling, one part is selected since the Beam design is of a single piece construction. In the Oldham, Mini Soft, and Jaw coupling designs, three parts are selected; two hubs and a center member. When the shaft size of the driver and driven are the same diameter, the hubs selected will be the same. When the shaft diameters differ, hubs selected will differ accordingly.

Information necessary before a coupling can be selected:

- HP and RPM of driver
- Shaft size of driver and driven
- Application requirements
- Environmental conditions (i.e. extreme temperature, corrosive conditions, space limitations)

Formulas:

$$\text{Nominal Torque} = \text{in-lbs} = \frac{(HP \times 63025)}{RPM}$$

$$Nm = \frac{(KW \times 9550)}{RPM}$$

Design Torque = Nominal Torque x Application Service Factor

(In the case of the Beam coupling only, Design Torque = Nominal Torque)

M

Steps In Selecting A Coupling.

Step 1: Determine the Nominal Torque of your application by using the following formula:

$$\text{Nominal Torque} = \text{in-lbs} = \frac{(HP \times 63025)}{RPM}$$

$$Nm = \frac{(KW \times 9550)}{RPM}$$

Step 2: If you are selecting an Oldham, Mini Soft or Jaw coupling please skip to Step 4.

Beam Coupling Selection

Step 3: For the Beam coupling determine if the coupling should be mounted with set screws or by the split hub/clamp method. The split hub/clamp method is recommended for accurate positioning.

In the case of the Beam coupling, Design Torque = Nominal Torque. Using the Beam Coupling Performance Data chart (pg. M-7), select the coupling size by first matching the application Design Torque requirements to the Beam Coupling Rated Torque shown in the chart. If the application is continuous operation in one direction, use the column titled Rated Torque Nominal. If the application is back/forth or start/stop/reverse, use the column titled Rated Torque Reversing.

Scan down the appropriate column to the first entry where the Rated Torque value in the column is greater than or equal to the Nominal Torque calculated in Step 1. Note that windup will be less with a Beam coupling that is oversized. This can be useful in applications that require close positioning in start/stop/reverse drives.

Continue with selection by going to Step 6.

Oldham, Mini Soft, and Jaw Coupling Selection

Step 4: For the Oldham coupling determine if the coupling should be mounted with set screws or by the split hub/clamp method. The split hub/clamp method is recommended for accurate positioning. For the Oldham, Mini Soft and Jaw coupling, refer to the Application Service Factors chart (pg. M-4). Review the Application Service Factor and select the factor that is best related to the application operating environment.

Step 5: Calculate the Design Torque of your application by multiplying the Nominal Torque calculated in Step 1 by the Application Service Factor. Design Torque = Nominal Torque x Application Service Factor. Refer to the appropriate coupling Performance Data Chart (pg. M-8) and scan down the Rated Torque column. The first entry to accommodate the calculated Design Torque is then sufficiently rated for the application.

General selection process

Step 6: Compare the application driver/driven shaft sizes to the Maximum Bore size available for the coupling selected. If the coupling bore size is not large enough for the shaft diameter, select the next largest coupling that will accommodate the driver/driven shaft diameters.

Step 7: Using the Product Number Selection charts (pg. M-5 and M-6) locate the appropriate bore size for the model coupling you have selected. Keyways are only available in the Jaw coupling design of the Miniature coupling series. Find the associated Lovejoy Item (UPC) number. Use of the Lovejoy Item (UPC) will ensure accuracy when placing your order. If the available bore sizes for the coupling you have selected are not shown in sizes to match your application requirements, please contact Lovejoy Engineering for further advice.

Note: When specifying the coupling order, the **Beam** coupling only requires one UPC number since it is a single piece construction coupling. The **Oldham, Mini Soft, and Jaw** couplings require three UPC numbers, one to specify the center member and two to specify each of the hubs.

Mini Coupling Selection Process

The Coupling Comparison chart compares the four types of Lovejoy Miniature couplings on the basis of several performance characteristics. It is to be used to determine the type of coupling that is best suited for the application. The performance characteristic values are used to weigh each characteristic on the following scale:

3 ***Excellent***
2 ***Good***
1 ***Fair***

Note: No one coupling is suited to all types of requirements. The purpose of this chart is to assist in determining the coupling most likely to fulfill the requirements.

Coupling Comparison

Characteristics	Beam	Oldham	Mini Soft	Jaw
Hub Material	Aluminum	Aluminum	Zinc Alloy/Sintered Iron	Sintered Iron
Center Material	(None)	Polyacetal	Polyurethane	See Note[1]
Attachment	Set Screw and Clamp	Set Screw and Clamp	Set Screw	Set Screw
Torsional Stiffness [2]	2	3	2	2
Zero Backlash	Yes	No	No	No
Reactionary Loading [3]	3	2	2	2
Ease of Installation	3	2	2	2
Damping Ability	1	2	3	2
Angular Misalignment Capacity	3	3	2	2
Parallel Misalignment Capacity	2	3	1	2
End Float Restrictions	1	1	3	3
Chemical Resistance	3	2	2	2
Temperature Resistance	3	1	1	1
Constant Velocity	3	2	1	2
Start Stop/Reverse Cycle	3	2	1	2
Fail Safe	No	No	No	Yes

Notes: **1.** Jaw elastomer material available: NBR (SOX) Rubber, Urethane, Hytrel, Bronze.
2. Amount of windup of the coupling at rated torque. Jaw coupling torsional stiffness can be increased by using an elastomer with harder material characteristics. An example is Hytrel, which has harder material properties than NBR (SOX) Rubber, and provides nominal torque ratings approximately twice the NBR (SOX) torque ratings.
3. Tendency to put a radial load on the support bearings.

Application Service Factors

	Constant Torque 0 -10 Hrs./Day	Varying Torque[1] 0 -10 Hrs./Day	Constant Torque 11 - 24 Hrs./Day	Varying Torque[1] 11 - 24 Hrs./Day
Start/Stop = 0 -120/Hr. Temperature = 50º - 85º F	1.2	1.7	1.7	2.2
Start/Stop = 0 -120/Hr. Temperature = 86º - 104º F	1.4	2.0	2.0	2.6
Start/Stop = 0 -120/Hr. Temperature = 105º - 140º F	1.7	2.5	2.5	3.2
Start/Stop = 121 - 240/Hr. Temperature = 50º - 85º F	1.5	2.2	2.2	2.8
Start/Stop = 121 - 240/Hr. Temperature - 86º - 104º F	1.8	2.5	2.5	3.3
Start/Stop = 121 - 240/Hr. Temperature = 105º - 140º F	2.2	3.1	3.1	4.1

Note: **1.** Varying Torque is defined as any load that varies in magnitude or direction.

Product Number Selection Charts

When referencing the Lovejoy Item (UPC) number, include 685144 as a prefix to the number shown in the table below.

Beam

Bore	ES050	EC050	ES075	EC075	ES100	EC100	ES112	EC112
1/8 x 1/8	56618	56620	.....	.....	.....	.....	.....	.....
3/16 x 3/16	.....	.....	56622	56628	.....	.....	.....	.....
3/16 x 1/8	58286	58284	.....	.....	.....	.....	.....	.....
3/16 x 1/4	.....	.....	56624	56630	.....	.....	.....	.....
1/4 x 1/4	.....	.....	56626	56632	56634	56640	.....	.....
1/4 x 3/8	.....	.....	.....	.....	56636	56642	.....	.....
3/8 x 3/8	.....	.....	.....	.....	56638	56644	56646	56652
3/8 x 1/2	.....	.....	.....	.....	.....	.....	56648	56654
5/16 x 5/16	.....	.....	.....	.....	58294	58292	58302	58298
1/2 x 1/2	.....	.....	.....	.....	.....	.....	56650	56656
3mm x 3mm	56666	56668	.....	.....	.....	.....	.....	.....
4mm x 4mm	.....	.....	56670	56676	.....	.....	.....	.....
5mm x 5mm	.....	.....	56672	56678	.....	.....	.....	.....
6mm x 6mm	.....	.....	56674	56680	56682	56688	.....	.....
8mm x 8mm	.....	.....	.....	.....	56684	56690	.....	.....
10mm x 10mm	.....	.....	.....	.....	56686	56692	56694	56698
12mm x 12mm	.....	.....	.....	.....	.....	.....	56696	56700

Oldham

For Oldham couplings order two hubs and one center member.

Bore	MOL16	MOL16C	MOL20	MOL20C	MOL25	MOL25C	MOL32	MOL32C
Center Member	58075	58075	58087	58087	58099	58099	58110	58110
1/8	58076	58603	58605	58609	58611	58615	.....	.....
3/16	58077	58083	58088	58610	58612	58616	.....	.....
1/4	58078	.....	58089	58095	58100	58617	.....	.....
5/16	.....	.....	58090	58096	58101	58618	.....	.....
3/8	.....	.....	.....	.....	58102	58107	58111	58119
7/16	.....	.....	.....	.....	.....	.....	58112	58120
1/2	.....	.....	.....	.....	.....	.....	58113	58121
3mm	58079	58601	58604	58606	.....	.....	.....	.....
4mm	58080	58602	58091	58607	.....	.....	.....	.....
5mm	58081	58084	58092	58608	58103	58613	.....	.....
6mm	58082	58085	58093	58097	58104	58614	.....	.....
8mm	.....	.....	58094	58098	58105	58108	58114	58619
10mm	.....	.....	.....	.....	58106	58109	58115	58122
11mm	.....	.....	.....	.....	.....	.....	58116	58123
12mm	.....	.....	.....	.....	.....	.....	58117	58124
14mm	.....	.....	.....	.....	.....	.....	58118	58980

Product Number Selection (cont.)

When referencing the Lovejoy Item (UPC) number, include 685144 as a prefix to the number shown in the table below.

Mini Soft

For Mini Soft couplings order two hubs and one center member.

Bore	MSF16	MSF20	MSF25	MSF32
Center Member	58037	58047	58056	58066
1/8	58038	.....	.....	.....
3/16	58039	58048	.....	.....
1/4	58040	58049	58057	.....
5/16	58041	58050	58058	59457
3/8	.....	58051	58059	58067
7/16	.....	.....	58060	58068
1/2	.....	.....	.....	58069
3mm	58042	.....	.....	.....
4mm	58043	.....	.....	.....
5mm	58044	58052	.....	.....
6mm	58045	58053	58061	.....
8mm	58046	58054	58062	58070
10mm	.....	58055	58063	58071
11mm	.....	.....	58064	58072
12mm	.....	.....	58065	58073
14mm	.....	.....	.....	58074

Jaw

For Jaw couplings order two hubs and one center member.

Center Member	L035	L050
NBR (SOX) (solid)	10118	10194
Urethane (solid)	.....	37786
Hytrel (solid)	.....	25307
Bronze (open center)	.....	10198

Hub Bore	Keyway	L035	L050
1/8	no keyway	10124	.....
3/16	no keyway	10126	.....
1/4	no keyway	10127	10206
5/16	no keyway	10128	10207
3/8	no keyway	24687	10208
7/16	no keyway	.....	10209
1/2	no keyway	.....	10210
1/2	1/8 x 1/16	.....	10211
9/16	no keyway	.....	10212
9/16	1/8 x 1/16	.....	10213
5/8	no keyway	.....	10214
4mm	no keyway	41850	.....
5mm	no keyway	47419	46214
6mm	no keyway	45872	50351
7mm	no keyway	60679	10215
8mm	no keyway	55169	41460
9mm	3 x 1.4mm	.....	41313
10mm	no keyway	.....	10216
10mm	3 x 1.4mm	.....	41450
11mm	4 x 1.8mm	.....	41314
12mm	4 x 1.8mm	.....	41315
14mm	5 x 2.3mm	.....	41316
15mm	5 x 2.3mm	.....	41451
16mm	5 x 2.3mm	.....	56176

Beam Coupling Performance Data—Inch Bores

Size	Attachment	Bore +.001 A1	Bore +.001 A2	Rated Torque Nominal in-lb	Rated Torque Nominal Nm	Rated Torque Reversing in-lb	Rated Torque Reversing Nm	Torsional Stiffness in-lb /rad	Torsional Stiffness Nm /rad	Inertia, J[1] x10E-7 in-lb-sec²	Inertia, J[1] x10E-7 Nm-sec²	Misalignment Parallel in	Misalignment Parallel mm	Misalignment Angular degrees	Weight[1] oz.	Weight[1] g	Screw Size	Screw Torque in-lb	Screw Torque Nm	Max. RPM x1000
ES050	Set Screw	.125	.125	1.75	0.2	.88	0.1	42.8	4.8	6.9	0.8	0.01	.25	5	0.1	3.6	4-40	5	0.6	10
		.188	.125	1.35	0.2	.68	0.1	21.3	2.4											
EC050	Clamp	.125	.125	1.75	0.2	.88	0.1	42.8	4.8	10.9	1.2	0.01	.25	5	0.2	5.8	1-72	4	0.5	10
		.188	.125	1.35	0.2	.68	0.1	21.3	2.4											
ES075	Set Screw	.188	.188	4.55	0.5	2.28	0.3	119.4	13.5	52.3	5.9	0.01	.25	5	0.4	12.0	8-32	20	2.3	10
		.250	.188	4.00	0.5	2.00	0.2	119.4	13.5											
		.250	.250	4.00	0.5	2.00	0.2	77.4	8.7											
EC075	Clamp	.188	.188	4.55	0.5	2.28	0.3	119.4	13.5	64.5	7.3	0.01	.25	5	0.5	15.0	4-40	13	1.5	10
		.250	.188	4.00	0.5	2.00	0.2	119.4	13.5											
		.250	.250	4.00	0.5	2.00	0.2	77.4	8.7											
ES100	Set Screw	.250	.250	10.50	1.2	5.25	0.6	286.5	32.4	225.0	25.4	0.01	.25	5	1.1	30.0	10-24	35	4.0	10
		.313	.313	9.50	1.1	4.75	0.5	204.6	23.1											
		.375	.250	8.50	1.0	4.25	0.5	146.9	16.6											
		.375	.375	8.50	1.0	4.25	0.5	146.9	16.6											
EC100	Clamp	.250	.250	10.50	1.2	5.25	0.6	286.5	32.4	289.0	32.7	0.01	.25	5	1.3	38.0	6-32	25	2.8	10
		.313	.313	9.50	1.1	4.75	0.5	204.6	23.1											
		.375	.250	8.50	1.0	4.25	0.5	146.9	16.6											
		.375	.375	8.50	1.0	4.25	0.5	146.9	16.6											
ES112	Set Screw	.313	.313	16.50	1.9	8.25	0.9	409.3	46.2	386.0	43.6	0.01	.25	5	1.4	39.0	1/4-20	80	9.0	10
		.375	.375	15.00	1.7	7.50	0.8	301.6	34.1											
		.500	.375	11.50	1.3	5.75	0.6	163.7	18.5											
		.500	.500	11.50	1.3	5.75	0.6	163.7	18.5											
EC112	Clamp	.313	.313	16.50	1.9	8.25	0.9	409.3	46.2	536.0	60.6	0.01	.25	5	1.9	54.0	6-32	25	2.8	10
		.375	.375	15.00	1.7	7.50	0.8	301.6	34.1											
		.500	.375	11.50	1.3	5.75	0.6	163.7	18.5											
		.500	.500	11.50	1.3	5.75	0.6	163.7	18.5											

Beam Coupling Performance Data—Metric Bores

Size	Attachment	Bore H8 A1	Bore H8 A2	Rated Torque Nominal in-lb	Rated Torque Nominal Nm	Rated Torque Reversing in-lb	Rated Torque Reversing Nm	Torsional Stiffness in-lb /rad	Torsional Stiffness Nm /rad	Inertia, J[1] x10E-7 in-lb-sec²	Inertia, J[1] x10E-7 Nm-sec²	Misalignment Parallel in	Misalignment Parallel mm	Misalignment Angular degrees	Weight[1] oz.	Weight[1] g	Screw Size	Screw Torque in-lb	Screw Torque Nm	Max RPM x1000
ES050	Set Screw	3mm	3mm	1.77	0.20	.89	0.10	46.1	5.2	7.1	0.8	0.01	.25	5	0.1	3.7	M2.5	5	0.6	10
EC050	Clamp	3mm	3mm	1.77	0.20	.89	0.10	46.1	5.2	10.6	1.2	0.01	.25	5	0.2	5.8	M1.6	5	0.6	10
ES075	Set Screw	4mm	4mm	4.87	0.55	2.48	0.28	144.9	16.4	52.2	5.9	0.01	.25	5	0.5	13.0	M4	19	2.1	10
		5mm	5mm	4.43	0.50	2.21	0.25	112.7	12.7											
		6mm	6mm	4.16	0.47	2.12	0.24	73.5	8.3											
EC075	Clamp	4mm	4mm	4.87	0.55	2.48	0.28	144.9	16.4	64.6	7.3	0.01	.25	5	0.5	15.0	M2.5	10	1.1	10
		5mm	5mm	4.43	0.50	2.21	0.25	112.7	12.7											
		6mm	6mm	4.16	0.47	2.12	0.24	73.5	8.3											
ES100	Set Screw	6mm	6mm	10.62	1.20	5.31	0.60	298.3	33.7	224.8	25.4	0.01	.25	5	1.1	30.0	M5	42	4.7	10
		8mm	8mm	9.74	1.10	4.87	0.55	202.8	22.9											
		10mm	10mm	7.97	.90	3.98	0.45	130.0	14.7											
EC100	Clamp	6mm	6mm	10.62	1.20	5.31	0.60	298.3	33.7	289.4	32.7	0.01	.25	5	1.3	38.0	M3	18	2.0	10
		8mm	8mm	9.74	1.10	4.87	0.55	202.8	22.9											
		10mm	10mm	7.97	.90	3.98	0.45	130.0	14.7											
ES112	Set Screw	10mm	10mm	15.05	1.70	7.34	0.83	281.7	31.8	392.1	44.3	0.01	.25	5	1.4	39.0	M6	68	7.7	10
		12mm	12mm	12.39	1.40	6.20	0.70	187.8	21.2											
EC112	Clamp	10mm	10mm	15.05	1.70	7.34	0.83	281.7	31.8	543.4	61.4	0.01	.25	5	1.9	54.0	M3	18	2.0	10
		12mm	12mm	12.39	1.40	6.20	0.70	187.8	21.2											

Notes: **1.** Inertia and Weight are based on smallest bore.

2. Maximum recommended temperature is 200ºF (141ºC). Maximum RPM all sizes 10,000 RPM.
Manufacturing dimensional tolerances unless otherwise specified x.x = +/- .25mm.

Oldham Coupling Performance Data

Size	Attachment	Bore Maximum +.001 H8 in	mm	Rated Torque Nominal in-lb	Nm	Torsional Stiffness in-lb /rad	Nm /rad	Inertia, J² x10E-7 in-lb-sec²	x10E-7 Nm-sec²	Misalignment Parallel in	mm	Angular degrees	Weight² oz.	g	Screw Size	Screw Torque in-lb	Nm	Max RPM x1000
MOL-16	Set Screw	.250	6	6.2	0.7	620	70	22.1	2.5	.04	1.00	3	0.2	7	M3	6	0.7	24.0
MOL-16C	Clamp	.188	6	6.2	0.7	620	70	35.4	4.0	.04	1.00	3	0.4	11	M2.5	9	1.0	9.5
MOL-20	Set Screw	.313	8	10.6	1.2	974	110	69.0	7.8	.06	1.50	3	0.5	15	M4	16	1.8	19.0
MOL-20C	Clamp	.313	8	10.6	1.2	974	110	97.4	11.0	.06	1.50	3	0.8	22	M2.5	9	1.0	7.6
MOL-25	Set Screw	.375	10	17.7	2.0	1770	200	204	23.0	.08	2.00	3	1.0	28	M5	35	4.0	15.0
MOL-25C	Clamp	.375	10	17.7	2.0	1770	200	292	33.0	.08	2.00	3	1.4	40	M3	13	1.5	6.1
MOL-32	Set Screw	.500	14	39.8	4.5	7877	890	646	73.0	.10	2.50	3	1.9	55	M6	62	7.0	12.0
MOL-32C	Clamp	.500	14	39.8	4.5	7877	890	885	100.0	.10	2.50	3	2.6	75	M4	22	2.5	4.8

M

Mini Soft Coupling Performance Data

Size	Attachment	Bore Maximum +.001 H8 in	mm	Rated Torque Nominal in-lb	Nm	Torsional Stiffness in-lb /rad	Nm /rad	Inertia, J² x10E-7 in-lb-sec²	x10E-7 Nm-sec²	Misalignment Parallel in	mm	Angular degrees	Weight² oz.	g	Screw Size	Screw Torque in-lb	Nm	Max RPM x1000
MSF-16	Set Screw	.313	8	4.4	0.5	27	3	81.4	9.2	.01	.20	2	0.8	22	M3	6	0.7	24
MSF-20	Set Screw	.375	10	8.9	1.0	80	9	248.0	28.0	.01	.20	2	1.5	43	M3	6	0.7	19
MSF-25	Set Screw	.438	12	13.3	1.5	106	12	735.0	83.0	.01	.20	2	3.0	84	M4	16	1.8	15
MSF-32	Set Screw	.500	14	26.6	3.0	266	30	2390.0	270.0	.01	.20	2	5.6	160	M4	16	1.8	12

Jaw Coupling Performance Data

(also see pages JW-7 and JW-20)

Size	Attachment	Bore Maximum +.001 H8 in	mm	Rated Torque Nominal in-lb	Nm	Inertia, J² x10E-7 in-lb-sec²	x10E-7 Nm-sec²	Misalignment Parallel in	mm	Angular degrees	Weight² oz.	g	Set Screw Size in	mm	Set Screw Torque in-lb	Nm	Max RPM x1000
L-035	NBR (SOX)	.375	9	3.5	0.4	77.6	8.8	.015	.381	1	1.6	45.4	6-32	M3	8	0.9	31
L-050	NBR(SOX)	.625	16	26.3	3.0	1397.5	158.0	.015	.381	1	3.2	90.8	$^1/_4$-20	M6	83	9.4	18
	Urethane	.625	16	39.5	4.5	1397.5	158.0	.015	.381	1	3.2	90.8	$^1/_4$-20	M6	83	9.4	18
	Hytrel	.625	16	50.0	5.6	1397.5	158.0	.015	.381	0.5	3.2	90.8	$^1/_4$-20	M6	83	9.4	18
	Bronze	.625	16	50.0	5.6	1816.0	205.4	.010	.254	0.5	4.2	119.2	$^1/_4$-20	M6	83	9.4	.25

Notes: **1.** Shaft attachment for jaw couplings is via set screw.
2. Inertia and weight are based on smallest bore.
3. See page M-4 for Performance Data.

Beam Couplings

The Beam flexible coupling is formed from one piece of aluminum rod. A spiral slot is cut through the length of the aluminum tube forming a "spring" center section referred to as a helical coil or beam. The flexure allowed by the beam portion of the coupling is capable of accommodating angular, parallel and axial misalignment while continuing to convey power between the attached shafts. This results in a single piece, true flexible coupling.

The Miniature Beam coupling is designed for very light power transmission applications where accurate positioning of shafts is an essential requirement. It also has a very high tolerance to heat, chemicals, and corrosion that would be harmful to conventional elastomeric flexible couplings. The Miniature Beam coupling design is very well suited for small shaft applications and the inherent requirements of start/stop/reverse applications where zero backlash and extreme positioning accuracy are important. This coupling operates either clockwise or counter clockwise without sacrificing windup or torque capabilities.

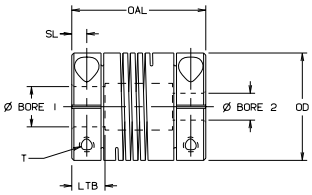
The Lovejoy Beam coupling is offered with either one set screw or with a split clamping hub for attachment to shafts. The clamping hub is highly recommended for instrumentation type applications due to the reliability of the attachment method to inhibit any movement on the shaft.

The Lovejoy Beam coupling is made of Aluminum Alloy 7075-T6 and has a Sulphuric Acid Anodized (Type 2) finish.

Hub Material: *Aluminum*
Finish: *Anodized*
Attachment: *Set Screw or Clamping*

CLAMPING TYPE

SET SCREW TYPE



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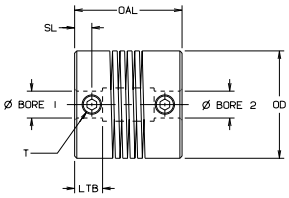


SET SCREW TYPE

Features

- All-metal coupling.
- Easy to install...one piece.
- High angular misalignment capability to 5º.
- Parallel .010 shaft centerline offset (.020 TIR). (Note that the maximum angular and parallel offsets cannot both occur at the same time.)
- Axial motion +/- .010. (Care must be taken at the time of installation not to compress or expand the coupling axially, the springs should be relaxed.)
- Temperature allowable up to 200º F (93.3º C) maximum continuous duty.
- Speed Limit: 10,000 RPM at full misalignment with standard coupling.

M

Dimensional Data

Size	Bore Sizes Available +.001 in	Bore Sizes Available H8 mm	Attachment	OD in	OD mm	LTB in	LTB mm	OAL in	OAL mm	SL in	SL mm	T in	T mm
ES050	.125	3	Set Screw	.50	13	.13	3	.50	13	.07	2	4-40	M2.5
EC050	.188		Clamp			.19	5	.75	19	.10	3	1-72	M1.6
ES075	.188 .250	4 5	Set Screw	.75	19	.18	5	.75	19	.10	3	8-32	M4
EC075	.250	6	Clamp			.25	6	.90	23	.13	3	4-40	M2.5
ES100	.250 .313	6 8	Set Screw	1.00	25	.26	7	1.00	25	.16	4	10-24	M5
EC100	.375	10	Clamp			.31	8	1.25	32	.15	4	6-32	M3
ES112	.313 .375	10	Set Screw	1.12	28	.28	7	1.12	28	.14	4	$^1/_4$-20	M6
EC112	.500 .500	12	Clamp			.45	11	1.50	38	.15	4	6-32	M3

Note: See page M-7 for Performance Data.

Oldham Couplings

The Lovejoy Oldham coupling is a precision engineered, torsionally stiff, three-piece coupling suitable for a great many applications ranging from incremental control of fluid valves to highly dynamic drives in closed loop servo systems. It accommodates misalignment mechanically through a floating disc that engages tenons machined out of the hubs. As the coupling rotates, the floating disc aligns with each hub alternately to an extent demanded by the alignment error. The principle of operation should not be confused with that of the Jaw coupling which accommodates misalignment through compression of an elastomer.

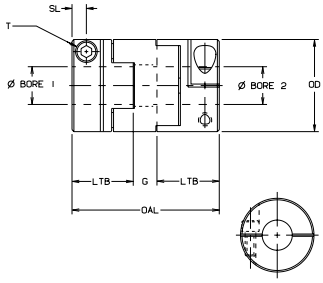
The Oldham coupling is the sacrificial element in the drive train. Under severe overload it will break cleanly, and act as a mechanical fuse to protect equipment. The floating disc is replaceable and a new floating disc fitted to undamaged hubs restores the coupling to its original specification.

Because parallel misalignment is accommodated by lateral displacement, the Lovejoy Oldham coupling can handle severe alignment errors within a short space envelope. This is a valuable feature in densely packaged and blind assemblies, or where misalignment can accelerate the erosion of shaft bearings.

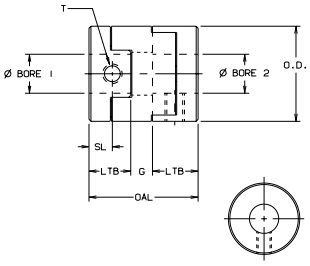
The Lovejoy Oldham coupling features raised dots on both sides of the floating disc which act as an effective spacer. The dots keep the face of the tenon from contacting the bottom of the floating disc and allows the coupling greater angular misalignment capability. A very important effect is that the spacer dots will greatly reduce the bending load on the shafts because of the freedom of the floating disc.

CLAMPING TYPE

SET SCREW TYPE



CLAMPING TYPE



SET SCREW TYPE

Features

- High torsional stiffness.
- Corrosion resistant.
- Angular misalignment 3º.
- Maximum temperature 176º F (80º C).

Hub Material: *Aluminum*
Finish: *Polyaccetal*
Attachment: *Set Screw or Clamping*

Dimensional Data

Size	Bore Sizes Available +.001 in	Bore Sizes Available H8 mm	Attachment	OD in	OD mm	LTB in	LTB mm	OAL in	OAL mm	G in	G mm	SL in	SL mm	T mm
MOL-16	.250	6	Set Screw	.630	16	.276	7.0	.709	18	.157	4	.138	3.5	M3
MOL-16C	.180	6	Clamp	.630	16	.492	12.5	1.142	29	.157	4	.118	3.0	M2.5
MOL-20	.312	8	Set Screw	.789	20	.354	9.0	.906	23	.197	5	.177	4.5	M4
MOL-20C	.312	8	Clamp	.789	20	.551	14.0	1.300	33	.197	5	.118	3.0	M2.5
MOL-25	.375	10	Set Screw	.984	25	.433	11.0	1.102	28	.236	6	.217	5.5	M5
MOL-25C	.375	10	Clamp	.984	25	.650	16.5	1.535	39	.236	6	.150	3.8	M3
MOL-32	.500	14	Set Screw	1.260	32	.512	13.0	1.300	33	.276	7	.256	6.5	M6
MOL-32C	.500	14	Clamp	1.260	32	.748	19.0	1.772	45	.276	7	.177	4.5	M4

Note: See page M-8 for Performance Data.

Mini Soft Couplings

The Lovejoy Mini Soft coupling provides protection from misalignment, vibration and shock loads. The simple design of the coupling ensures ease of assembly, installation and reliable performance. No special tools are needed for installation or removal. No lubrication is needed, and once installed and aligned correctly, no maintenance is required.

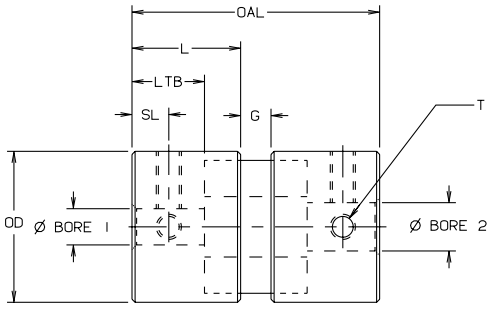
The Mini Soft coupling design is comprised of three parts. Two hubs with internal teeth engage an elastomeric flexible center, or sleeve, with external teeth. Each hub is attached to the respective shaft of the driver and driven, and torque is transmitted across the hubs through the center member sleeve. Misalignment and torsional shock loads are absorbed by shear deflection in the center sleeve element.

The shear characteristic of the coupling is very well suited to absorb impact. The Lovejoy Mini Soft coupling is designed with tooth contact which provides more surfaces carrying the load resulting in less wear at any one point, and torque that flows more smoothly. Additionally, the coupling allows for axial freedom which results in easier assembly and spacing of shafts. This feature is particularly useful in reducing thrust loads on bearings.

When operating within its rating, the coupling is torsionally stiff and will not react with twist during operation. The Polyurethane center member sleeve is known for its toughness and resistance to abrasion, and also provides for good damping and shock load capabilities. High speed performance is available with speeds up to 3,600 RPM when alignment not exceeding .01 parallel and 2 degrees angular is maintained. Electrical isolation is provided due to the center member sleeve forcing separation of the two hubs inhibiting transmission of electrical charges. The simple design of the coupling allows for "blind" installation.

Hub Material: *Cast Zinc alloy*
Sintered metal MSF-32 only
Center material: *Polyurethane*
Attachment: *Set Screw*

MINI SOFT



Features

- Easy blind assembly.
- Good shock load absorption.
- Good abrasion resistance.
- Maximum temperature 140º F (60º C).
- Angular misalignment 2º.

Dimensional Data

Size	Maximum Bore +.001 in	Maximum Bore H8 mm	OD in	OD mm	LTB in	LTB mm	OAL in	OAL mm	G in	G mm	SL in	SL mm	T mm	Center Member Inside Diameter in	Center Member Inside Diameter mm
MSF-16	.3125	8	.630	16	.315	8	1.063	27	.118	3	.157	4	M3	.250	6
MSF-20	.3750	10	.787	20	.394	10	1.339	34	.157	4	.197	5	M3	.300	8
MSF-25	.4375	12	.984	25	.472	12	1.614	41	.197	5	.236	5	M4	.400	10
MSF-32	.5000	14	1.260	32	.551	14	1.890	48	.236	6	.280	7	M4	.455	12

Note: See page M-8 for Performance Data.

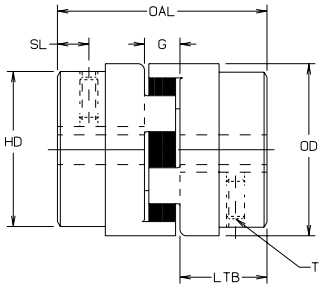
Miniature Jaw

The Lovejoy Miniature Jaw coupling provides positive engagement resulting in great strength because of the large area of contact of the elastomer or "spider" center member with the interlocking jaws. This Miniature coupling provides "fail safe" operations and is the only coupling that will continue to run, even if the elastomer "spider" fails. Torque will continue to be transmitted through the metal jaw contact.

Good torsional stiffness is provided due to high compression loading. Vibration control is provided though the elastomer center member "spider" and its excellent damping ability. Raised "dots", a Lovejoy feature, designed into the elastomer center member "spider", separate the jaw of one hub from the face of the other hub, and automatically set the spacing between the hubs.

The Jaw type coupling design provides rubber in compression which accommodates much more load without failure than rubber in shear or tension.

The Miniature Jaw coupling is radially stiff when misaligned beyond its limits of .015″ offset and 1 degree angular. Radial stiffness results in radial loads on the bearings, called reactionary loads. As the elastomer "set" takes place, the radial loads are eased.



Elastomer Materials

NBR (SOX) Rubber – Nitrile Butadiene Rubber NBR (SOX) is a flexible insert material that is oil resistant, resembles natural rubber in resilience and elasticity and operates effectively in a temperature range of -40º to +212ºF (-40º to +100ºC). NBR (SOX) also provides good resistance to oil and is the standard Jaw coupling elastomer.

Urethane – Urethane has greater torque capability *(1.5 times)* than NBR (SOX), provides less damping effect, and operates at a temperature range of -30º to 160ºF (-34º to +71ºC) and has good resistance to oil and chemicals.

Hytrel – Hytrel is a flexible elastomer designed for high torque and high temperature operations. Hytrel can operate in temperatures of -60º to +250ºF (-51º to +121ºC) and has an excellent resistance to oil and chemicals.

Bronze – Bronze is a rigid, porous, oil-impregnated metal insert exclusively for slow speed (maximum 250 RPM) applications requiring high torque capabilities. Bronze operations are not affected by extreme temperatures, water, oil or dirt.

- **Hub Material:** *Sintered iron*
- **Center Material:** *NBR (SOX) Rubber* *L035 &L050*
  Urethane *L050 only*
  Hytrel *L050 only*
  Bronze *L050 only*

Features

- Positive engagement with jaw interlocking
- Fail safe
- Good torsional stiffness
- Vibration damping ability
- Easy to install
- Center elastomer dits keep hubs form touching
- Exceptional overload capacity
- Spider arms are in compression
- Widely distributed
- Choice in center elastomer hardness

Dimensional Data

Model Number	Maximum Bore		Outer Diameter OD		Overall Length OAL		Distance Between Flanges G		Length Thru Bore LTB		Screw Location SL		Screw Size T		Approx Wt. (lbs.)		Moment of Inertia WR^2
	+.001 in	H8 mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	Solid	Max. Bore	lb-in² (Solid)
L-035	.375	10	.625	16	.81	21	.28	7	.27	7	.13	3.3	6-32	M3	.1	.083	.003
L-050	.625	16	1.075	27	1.71	44	.48	16	.62	16	.31	8	1/4-20	M6	.3	.240	.054

Note: See page M-8 for Performance Data.