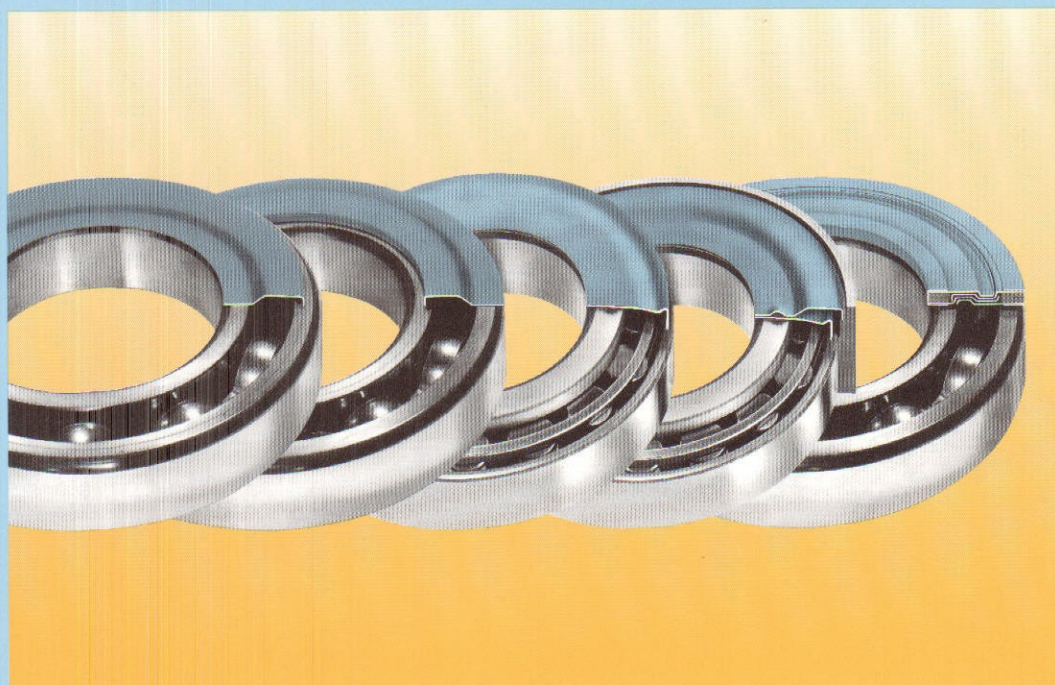


METALLIC SEALS FOR BEARINGS

NILOS RINGS



NILOS RINGS THROUGHOUT THE WORLD

950-710

STANDARD STYLES

NILOS Rings are available in two standard styles. The type with the sealing lip situated to bear on the outer ring of the bearing is indicated by the suffix "AV" in the NILOS part number.

Example: NILOS part number 6310 AV indicates an "outer ring sealing" NILOS Ring for a single row deep groove ball bearing. This bearing would commonly be identified as a "310" size.

The NILOS Ring design with the sealing lip situated to bear against the inner ring of the bearing is specified by the suffix "JV" in the NILOS part number.

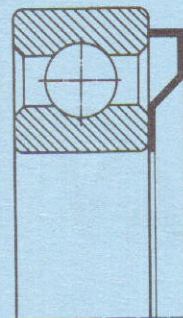
Example: NILOS part number 6310 JV indicates an "inner ring sealing" NILOS Ring for a single row deep groove ball bearing of the "310" size.

Both of the above described NILOS ring types may be employed for circumferential speeds up to 1000 surface feet per minute (see page 9). If higher speeds are anticipated, please so indicate when ordering so that the proper alterations in the NILOS design may be incorporated. As a general rule, it is more desirable to use the "JV" type of NILOS Ring as the sealing lip would be subjected to a smaller area of contact with the bearing ring.

BEARINGS WITH INTEGRAL SHIELDS OR SEALS

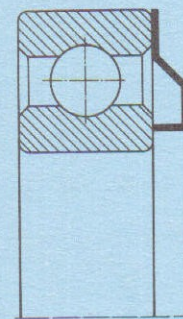
NILOS Rings are also available for bearings that are already equipped with integral shields or seals. For those bearings we supply a modified NILOS Ring with altered dimensions so that the shield or seal already in the bearing is not contacted by the sealing lip of our NILOS Ring. When dirt or condensation water can penetrate to a bearing, NILOS Rings are particularly indispensable. The all-metal NILOS Ring seal is often used to protect the integral seal already in the bearing. When NILOS Rings are used with bearings that have integral shields or seals the letter "Z" should be added to the part number. NILOS part number 6205 ZAV specifies an "outer ring sealing" NILOS Ring for a single row deep groove ball bearing of the "205" size with shields or seals. By the same token, NILOS part number 6205 ZJV specifies a similar NILOS Ring design with the sealing lip bearing on the inner ring of the same size bearing.

AV



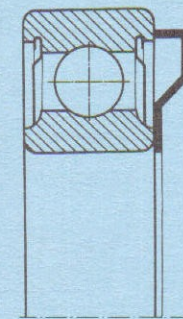
Dia. 1 NILOS Ring AV (outer ring sealing) fitted to a ball bearing

JV



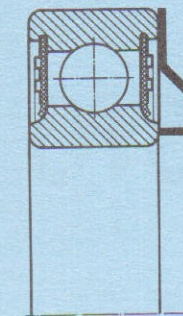
Dia. 2 NILOS Ring JV (inner ring sealing) fitted to a ball bearing

ZAV



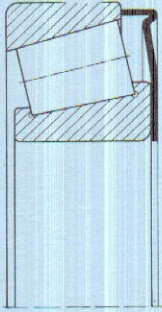
Dia. 3 NILOS Ring ZAV (outer ring sealing) fitted to a ball bearing with shields on both sides

ZJV



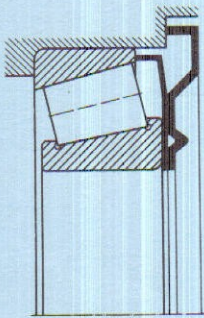
Dia. 4 NILOS Ring ZJV (inner ring sealing) fitted to a ball bearing with integral seals on both sides

AV



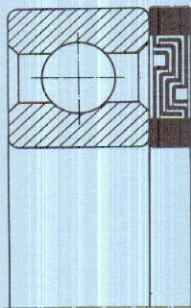
Dia. 5 NILOS Ring AV (cup sealing) fitted to a taper roller bearing

AK



Dia. 6 NILOS Ring AK (double outer sealing lips) fitted to a taper roller bearing

LSTO



Dia. 7 NILOS Ring LSTO (labyrinth sealing) fitted to a ball bearing

TAPER ROLLER BEARINGS

For taper roller bearings there is a type "AV" NILOS Ring that may be mounted on one side of the bearing. Because of the offset nature of the cone and cup on a taper roller bearing, the design of this NILOS Ring differs from those that would be used for ball or straight roller bearings. However, the ring is dimensioned and styled in such a manner that the sealing edge is always reliably in contact with the cup and, therefore, guarantees efficient sealing.

NILOS Rings, the sealing lip of which bears on the cup of a taper roller bearing, are specified by the suffix "AV" in the part number.

Example: NILOS part number 525/522 AV specifies a "cup sealing" NILOS Ring for an inch size taper roller bearing 525/522.

A second type of NILOS Ring design for taper roller bearings is specified by the suffix "AK". This style of ring is comprised of two closely connected sealing disks. The two disks are spot welded together. The outer piece has two locking dimples on the clamping surface.

Example: NILOS part number 418/414 AK specifies a NILOS seal with two sealing lips for taper roller bearing 418/414; one bears on the cup and the other on the housing (see sketch page 34).

NILOS LABYRINTH SEAL

NILOS Labyrinth Seal Ring Type LSTO consists of packings of laminated steel disks. This is not a contact type seal as the types previously described. It is provided with steel cores and is resistant to axial pressure. Thus, any axial movement of the bearing itself will not have a squeezing effect on the labyrinth section.

The NILOS seal LSTO is particularly desirable for applications which are exposed to extremely contaminated conditions. See detailed explanations pages 39 to 42).

Example: NILOS part number 30 x 55 LSTO specifies a labyrinth sealing for either ball or roller bearings with 30 mm I. D. and 55 mm O. D.

For trouble free service life of the equipment that you are producing, the right bearing, lubricant and seal are of the greatest importance. We have had thousands of individual experiences with the successful sealing of bearings with NILOS Rings. Do not hesitate to let us help you with your seal problems.

What they will do:

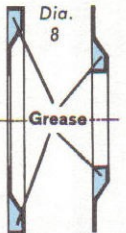
The NILOS Ring is a bearing seal that protects efficiently against the entry of all kinds of foreign matter into the bearing. Being entirely made of galvanized steel it is a particularly effective protection against tough abrasive particles. It will retain grease in a bearing but will not work with oil lubricated bearings.

Sealing Effect

The sealing is attained by the sealing edge rotating under slight pressure against either the inner or outer bearing ring. This results in a shallow groove worn in the hardened bearing ring and so producing a miniature labyrinth. This small labyrinth prevents loss of the bearing grease and keeps out foreign matter. In order to prevent the sealing edge from sticking during its running-in period the recessed area of the NILOS Ring must be filled with grease when installed. Once run-in the NILOS Ring needs no further attendance.

If the bearing application permits, it is better to use an inner ring sealing NILOS Ring type "JV" because it has a smaller sealing edge and the position of the sealing edge with regard to the centrifugal force of the lubricant is much more effective.

In the running-in and groove-forming process minute metal particles (approx. the consistency of fine powder) are formed. Normally these tiny particles are deposited on the outside of the sealing lip. Any of these particles that are directed inside the sealing are trapped in the grease, located in the recessed area of the NILOS Ring and do not affect the performance of the bearing.



Scope of the List

This catalog is arranged to specify the appropriate NILOS Rings for ball and roller bearings most commonly in use. Please inquire for NILOS Ring sizes which are not indicated as many are now available.

Bearing Speed may be a Factor

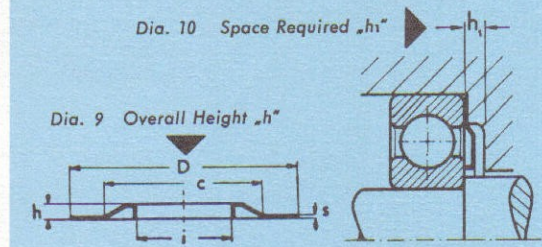
NILOS Rings are available for all bearing speeds. The standard catalog NILOS Ring is suitable for a maximum of 1000 surface feet per minute. In case of higher speed please check with us for engineering advise.

Basic Rule: Concentric Location

The sealing edge of the NILOS Ring must run perfectly concentric in order to form a miniature labyrinth groove. With an "AV" NILOS Ring the bore of the ring itself must fit closely to the shaft. In case of the "JV" NILOS Ring the outside edge of the ring itself is located by the housing. In either case the locating diameter must not be located in keyways or grooves etc.

**Overall Height "h"
Space Required "h₁"**

The space required to mount a NILOS Ring is very small and the method of fitting is very simple. These two advantages in many cases allow NILOS Rings to be fitted without alteration to existing design. The dimension "h₁" = h + 1 mm must be strictly observed. This will ensure that there is no possibility of distorting the NILOS Ring.



Lubrication of Bearings

Ball and roller bearings should be filled from 30 per cent to 50 per cent generally with bearing grease. Overgreasing involves excessive heating of bearing, the lubricant will break down and lose effectiveness.

Slip-Proof Clamping Required

The NILOS Ring must not turn when fixed to its clamping surface. Normally the snug fit of the bearing against the shaft collar for the outside sealing ring (type AV) and the usual clamping elements for the inside sealing ring (type JV) will suffice.

Identification Marking on Bearing Ring

The NILOS Ring should, when possible, be mounted on the side of the bearing, that does not contain the bearing identification number or name. If this cannot be avoided (as with double sealed bearings), the bearing should be installed in such a way that the marked ring side is towards the inside of the housing, or to the side least exposed to dirt etc.

Self-aligning and Spherical Roller Bearings

NILOS Rings cannot be used on bearings making self-aligning movements. Self-aligning and spherical roller bearings are, however, used for their greater load carrying capacity on many applications where misaligning is not involved. In these cases NILOS Rings are perfectly safe.

Cylindrical Roller Bearings without Flange

For these and for a number of similar bearings we suggest the use of the NILOS seal LSTO which is better equipped to follow the axial movements.

Taper Roller Bearings

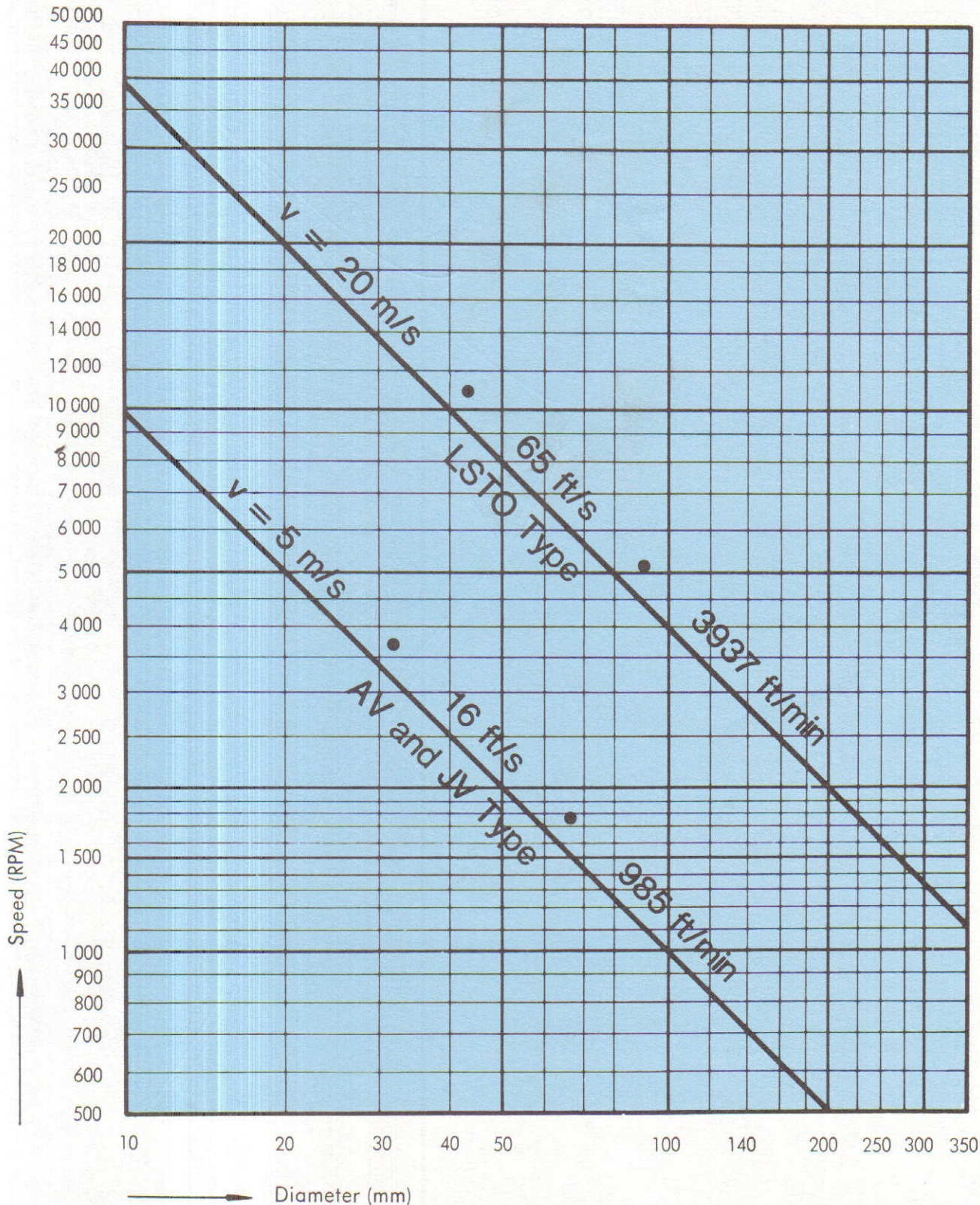
Taper roller bearings can be sealed by NILOS Rings type AV and AK. The mounting of the taper roller bearing and of the NILOS Ring should be made with special care to avoid damaging of the sealing edge.

Please note the suggestions on fitting of taper roller bearings on page 11.

Special Types

In addition to the types listed, we also manufacture many special types of NILOS Rings. If you have application requiring special rings please let us have drawings giving details concerning conditions, number of revolutions, etc.

SPEED DIAGRAM



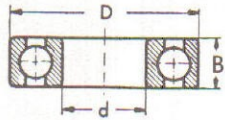
NILOS STANDARD STYLES

Velocity $v = 5 \text{ m/s}$ for NILOS Rings AV (diameter a) and JV (diameter i)

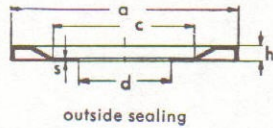
NILOS LABYRINTH SEAL

Velocity $v = 20 \text{ m/s}$ for NILOS Rings LSTO (diameter $\frac{D + d}{2}$)

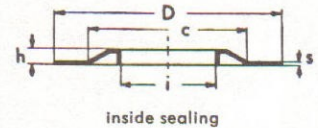
In case of higher velocity please check with us for engineering advise.



AV



JV



Bearing part number	d	D	B
62 00	10	30	9
62 01	12	32	10
62 02	15	35	11
62 03	17	40	12
62 04	20	47	14
62 05	25	52	15
62 06	30	62	16
62 07	35	72	17
62 08	40	80	18
62 09	45	85	19
62 10	50	90	20
62 11	55	100	21
62 12	60	110	22
62 13	65	120	23
62 14	70	125	24
62 15	75	130	25
62 16	80	140	26
62 17	85	150	28
62 18	90	160	30
62 19	95	170	32
62 20	100	180	34
62 21	105	190	36
62 22	110	200	38
62 24	120	215	40
62 26	130	230	40
62 28	140	250	42
62 30	150	270	45
62 32	160	290	48
62 34	170	310	52
62 36	180	320	52
62 38	190	340	55
62 40	200	360	58
62 44	220	400	65
62 48	240	440	72
62 52	260	480	80
62 60	300	540	85

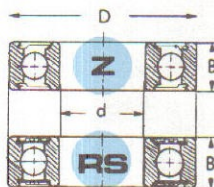
NILOS Ring part number	a	d	c	s	h
62 00 AV	27,5	10	18	0,3	1,8
62 01 AV	28,1	12	20	0,3	1,8
62 02 AV	31,8	15	22	0,3	2
62 03 AV	35,7	17	25	0,3	2
62 04 AV	41,2	20	29	0,3	2
62 05 AV	47	25	36	0,3	2,5
62 06 AV	56,2	30	44	0,3	2,5
62 07 AV	64,8	35	48	0,3	2,5
62 08 AV	72,7	40	57	0,3	3
62 09 AV	77,8	45	61	0,3	3
62 10 AV	82,8	50	67	0,3	3
62 11 AV	90,8	55	75	0,3	3
62 12 AV	100,8	60	85	0,3	3
62 13 AV	110,5	65	90	0,3	3
62 14 AV	115,8	70	95	0,3	3,5
62 15 AV	120,5	75	100	0,5	3,5
62 16 AV	129	80	106	0,5	3,5
62 17 AV	138,5	85	115	0,5	3,5
62 18 AV	148	90	124	0,5	3,5
62 19 AV	157,5	95	130	0,5	3,5
62 20 AV	167	100	135	0,5	4
62 21 AV	174	105	140	0,5	4
62 22 AV	184	110	150	0,5	4
62 24 AV	199	120	165	0,5	4
62 26 AV	214	130	173	0,5	4
62 28 AV	229	140	183	0,5	4
62 30 AV	248	150	200	0,5	4
62 32 AV	267	160	220	0,5	5
62 34 AV	286	170	235	0,5	5
62 36 AV	295	180	237	0,5	5
62 38 AV	314	190	260	0,5	5
62 40 AV	335	200	280	0,5	5
62 44 AV	369	220	285	0,7	5,8
62 48 AV	390	240	345	0,7	5,3
62 52 AV	440	260	388	0,7	8

NILOS Ring part number	i	D	c	s	h
62 00 JV	14,4	30	24	0,3	1,8
62 01 JV	16,4	32	26	0,3	1,8
62 02 JV	18,6	35	27	0,3	2
62 03 JV	21,5	40	31	0,3	2
62 04 JV	25,7	47	37	0,3	2
62 05 JV	31,5	52	42	0,3	2,5
62 06 JV	36,3	62	47	0,3	2,5
62 07 JV	43	72	56	0,3	2,5
62 08 JV	48	80	62	0,3	3
62 09 JV	53	85	68	0,3	3
62 10 JV	57,5	90	73	0,3	3
62 11 JV	64,5	100	80	0,3	3
62 12 JV	70	110	85	0,3	3
62 13 JV	74,5	120	95	0,3	3
62 14 JV	79,5	125	102	0,3	3,5
62 15 JV	85	130	105	0,5	3,5
62 16 JV	92	140	112	0,5	3,5
62 17 JV	98	150	125	0,5	3,5
62 18 JV	103	160	125	0,5	3,5
62 19 JV	110	170	137	0,5	3,5
62 20 JV	115	180	145	0,5	4
62 21 JV	119,5	190	158	0,5	4
62 22 JV	125,5	200	165	0,5	4
62 24 JV	134	215	175	0,5	4
62 26 JV	147	230	190	0,5	4
62 28 JV	160	250	200	0,5	4
62 30 JV	172	270	220	0,5	4
62 32 JV	184	290	240	0,5	5
62 34 JV	200	310	261	0,5	5
62 36 JV	205	320	265	0,5	5
62 38 JV	212	340	285	0,5	5
62 40 JV	220	360	305	0,5	5
62 44 JV	260	400	380	0,7	7
62 48 JV	260	440	380	0,7	7
62 60 JV	350	540	470	0,7	8

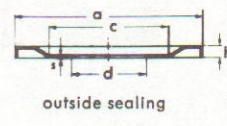
NILOS Rings for single row deep groove ball bearings with shields or seals

metric sized

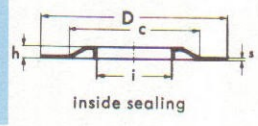
62 Series



ZAV



ZJV



BEARING part number		d	D	B
6200 Z	6200 RS	10	30	9
6201 Z	6201 RS	12	32	10
6202 Z	6202 RS	15	35	11
6203 Z	6203 RS	17	40	12
6204 Z	6204 RS	20	47	14
6205 Z	6205 RS	25	52	15
6206 Z	6206 RS	30	62	16
6207 Z	6207 RS	35	72	17
6208 Z	6208 RS	40	80	18
6209 Z	6209 RS	45	85	19
6210 Z	6210 RS	50	90	20
6211 Z	6211 RS	55	100	21
6212 Z	6212 RS	60	110	22
6213 Z	6213 RS	65	120	23
6214 Z	6214 RS	70	125	24

NILOS Ring part number	a	d	c	s	h
6200 Z AV	27,5	10	18	0,3	1,8
6201 Z AV	28,9	12	20	0,3	1,8
6202 Z AV	31,8	15	22	0,3	2
6203 Z AV	36,5	17	26	0,3	2
6204 Z AV	41,9	20	29	0,3	2
6205 Z AV	47,8	25	35	0,3	2,5
6206 Z AV	56,2	30	44	0,3	2,5
6207 Z AV	64,8	35	48	0,3	2,5
6208 Z AV	72,7	40	57	0,3	3
6209 Z AV	77,8	45	61	0,3	3
6210 Z AV	82,8	50	67	0,3	3
6211 Z AV	92,5	55	75	0,3	3
6212 Z AV	103	60	83	0,3	3
6213 Z AV	110,5	65	90	0,3	3
6214 Z AV	117,5	70	95	0,3	3

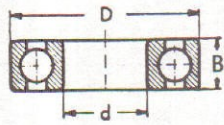
NILOS Ring part number	i	D	c	s	h
6200 Z JV	13,5	30	24	0,3	1,8
6201 Z JV	14,4	32	26	0,3	1,8
6202 Z JV	18,6	35	27	0,3	2
6203 Z JV	20,2	40	31	0,3	2
6204 Z JV	24,7	47	37	0,3	2
6205 Z JV	30	52	42	0,3	2,5
6206 Z JV	36,3	62	47	0,3	2,5
6207 Z JV	42,7	72	56	0,3	2,5
6208 Z JV	48	80	62	0,3	3
6209 Z JV	53	85	68	0,3	3
6210 Z JV	56,6	90	73	0,3	3
6211 Z JV	63	100	80	0,3	3
6212 Z JV	69,5	110	85	0,3	3
6213 Z JV	74,5	120	95	0,3	3
6214 Z JV	79,5	125	102	0,3	3,5



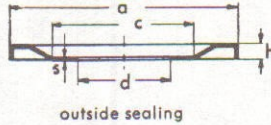
63 Series

NILOS Rings for single row deep groove ball bearings with shields or seals

metric sized

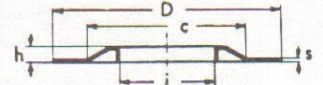


AV



outside sealing

JV



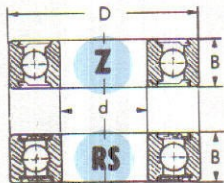
inside sealing

Bearing part number	d	D	B	AV						JV					
				NILOS Ring part number	a	d	c	s	h	NILOS Ring part number	i	D	c	s	h
63 00	10	35	11	63 00 AV	30,6	10	20	0,3	2	63 00 JV	15,5	35	27	0,3	2
63 01	12	37	12	63 01 AV	32,7	12	23	0,3	2	63 01 JV	17,5	37	29	0,3	2
63 02	15	42	13	63 02 AV	36,5	15	26	0,3	2	63 02 JV	20,8	42	33	0,3	2
63 03	17	47	14	63 03 AV	41,2	17	29	0,3	2	63 03 JV	23	47	36	0,3	2
63 04	20	52	15	63 04 AV	44,8	20	33	0,3	2	63 04 JV	27,2	52	40	0,3	2
63 05	25	62	17	63 05 AV	54,8	25	40	0,3	2,5	63 05 JV	32,2	62	47	0,3	2,5
63 06	30	72	19	63 06 AV	64,8	30	48	0,3	2,5	63 06 JV	37,2	72	56	0,3	2,5
63 07	35	80	21	63 07 AV	70,7	35	54	0,3	2,5	63 07 JV	45	80	65	0,3	2,5
63 08	40	90	23	63 08 AV	80,5	40	60	0,3	3	63 08 JV	51	90	70	0,3	3
63 09	45	100	25	63 09 AV	90,8	45	75	0,3	3	63 09 JV	56	100	80	0,3	3
63 10	50	110	27	63 10 AV	98,9	50	80	0,3	3	63 10 JV	62	110	86	0,3	3
63 11	55	120	29	63 11 AV	108	55	89	0,3	3	63 11 JV	67	120	93	0,3	3
63 12	60	130	31	63 12 AV	117,5	60	95	0,3	3	63 12 JV	73	130	102	0,5	3
63 13	65	140	33	63 13 AV	127,5	65	100	0,5	3,5	63 13 JV	77,5	140	110	0,5	3,5
63 14	70	150	35	63 14 AV	137	70	110	0,5	3,5	63 14 JV	82,6	150	120	0,5	3,5
63 15	75	160	37	63 15 AV	147	75	110	0,5	3,5	63 15 JV	87,2	160	125	0,5	3,5
63 16	80	170	39	63 16 AV	157,5	80	130	0,5	3,5	63 16 JV	95	170	138	0,5	3,5
63 17	85	180	41	63 17 AV	164	85	135	0,5	4	63 17 JV	100	180	140	0,5	4
63 18	90	190	43	63 18 AV	174	90	140	0,5	4	63 18 JV	106	190	150	0,5	4
63 19	95	200	45	63 19 AV	184	95	150	0,5	4	63 19 JV	115	200	160	0,5	4
63 20	100	215	47	63 20 AV	199	100	165	0,5	4	63 20 JV	118	215	170	0,5	4
63 21	105	225	49	63 21 AV	208	105	174	0,5	4	63 21 JV	127	225	180	0,5	4
63 22	110	240	50	63 22 AV	219	110	179	0,5	4	63 22 JV	133	240	197	0,5	4
63 24	120	260	55	63 24 AV	239	120	190	0,5	4	63 24 JV	142	260	205	0,5	4
63 26	130	280	58	63 26 AV	251	130	200	0,5	5	63 26 JV	148	280	225	0,5	5
63 28	140	300	62	63 28 AV	267	140	220	0,5	5	63 28 JV	165	300	235	0,5	5
63 30	150	320	65	63 30 AV	286	150	235	0,5	5	63 30 JV	172	320	255	0,5	5
63 32	160	340	68	63 32 AV	314	160	260	0,5	5	63 32 JV	185	340	276	0,5	5
63 34	170	360	72	63 34 AV	320	170	268	0,5	5	63 34 JV	200	360	295	0,5	5
63 36	180	380	75	63 36 AV	335	180	280	0,5	5	63 36 JV	222	380	330	0,7	6,5
63 38	190	400	78	63 38 AV	369	190	285	0,7	5,8	63 38 JV	222	400	330	0,7	6,5
63 40	200	420	80	63 40 AV	369	200	285	0,7	5,8	63 40 JV	260	420	380	0,7	7
63 44	220	460	88							63 44 JV	260	460	380	0,7	7

63 Series

NILOS Rings for single row deep groove ball bearings with shields or seals

metric sized



ZAV



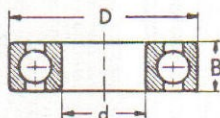
outside sealing

ZJV

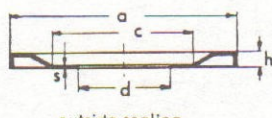


inside sealing

BEARING		d	D	B	ZAV						ZJV					
part number	part number				NILOS Ring part number	a	d	c	s	h	NILOS Ring part number	i	D	c	s	h
6300 Z	6300 RS	10	35	14	6300 Z AV	30,6	10	20	0,3	2	6300 Z JV	14,5	35	27	0,3	2
6301 Z	6301 RS	12	37	12	6301 Z AV	32,7	12	23	0,3	2	6301 Z JV	16,4	37	26	0,3	2
6302 Z	6302 RS	15	42	13	6302 Z AV	37,8	15	28	0,3	2	6302 Z JV	19	42	32	0,3	2
6303 Z	6303 RS	17	47	14	6303 Z AV	41,2	17	29	0,3	2	6303 Z JV	23	47	36	0,3	2
6304 Z	6304 RS	20	52	15	6304 Z AV	46,5	20	37	0,3	2	6304 Z JV	25,7	52	40	0,3	2
6305 Z	6305 RS	25	62	17	6305 Z AV	54,8	25	40	0,3	2,5	6305 Z JV	32,2	62	47	0,3	2,5
6306 Z	6306 RS	30	72	19	6306 Z AV	64,8	30	48	0,3	2,5	6306 Z JV	37,2	72	56	0,3	2,5
6307 Z	6307 RS	35	80	21	6307 Z AV	71,2	35	57	0,3	2,5	6307 Z JV	43,1	80	65	0,3	2,5
6308 Z	6308 RS	40	90	23	6308 Z AV	82,8	40	67	0,3	3	6308 Z JV	49,1	90	70	0,3	3
6309 Z	6309 RS	45	100	25	6309 Z AV	90,8	45	75	0,3	3	6309 Z JV	54	100	81	0,3	3
6310 Z	6310 RS	50	110	27	6310 Z AV	101,5	50	85	0,3	3	6310 Z JV	62	110	86	0,3	3
6311 Z	6311 RS	55	120	29	6311 Z AV	108	55	89	0,3	3	6311 Z JV	67	120	93	0,3	3
6312 Z	6312 RS	60	130	31	6312 Z AV	117,5	60	95	0,3	3	6312 Z JV	73	130	102	0,5	3
6313 Z	6313 RS	65	140	33	6313 Z AV	127,5	65	100	0,5	3,5	6313 Z JV	77,5	140	110	0,5	3,5
6314 Z	6314 RS	70	150	35	6314 Z AV	137	70	110	0,5	3,5	6314 Z JV	82,6	150	120	0,5	3,5

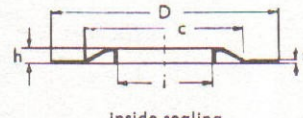


AV



outside sealing

JV



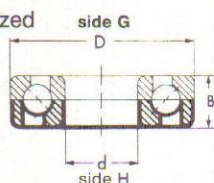
inside sealing

Bearing part number	d	D	B
64 03	17	62	17
64 04	20	72	19
64 05	25	80	21
64 06	30	90	23
64 07	35	100	25
64 08	40	110	27
64 09	45	120	29
64 10	50	130	31
64 11	55	140	33
64 12	60	150	35
64 13	65	160	37
64 14	70	180	42
64 15	75	190	45
64 16	80	200	48
64 17	85	210	52
64 18	90	225	54

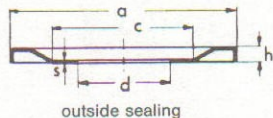
NILOS Ring part number	a	d	c	s	h
64 03 AV	54	17	36	0,3	2,5
64 04 AV	62,2	20	51	0,3	2,5
64 05 AV	69	25	55	0,3	2,5
64 06 AV	77,8	30	61	0,3	3
64 07 AV	88	35	71	0,3	3
64 08 AV	94,8	40	75	0,3	3
64 09 AV	105,8	45	84	0,3	3
64 10 AV	115,8	50	95	0,3	3,5
64 11 AV	125,8	55	95	0,5	3,5
64 12 AV	133,5	60	100	0,5	3,5
64 13 AV	143,5	65	110	0,5	3,5
64 14 AV	162	70	123	0,5	3,5
64 15 AV	169	75	140	0,5	4
64 16 AV	180	80	140	0,5	4
64 17 AV	188	85	155	0,5	4
64 18 AV	199	90	165	0,5	4

NILOS Ring part number	i	D	c	s	h
64 03 JV	28	62	43	0,3	2,5
64 04 JV	31,2	72	55	0,3	2,5
64 05 JV	36,2	80	62	0,3	2,5
64 06 JV	42	90	68	0,3	3
64 07 JV	47	100	77	0,3	3
64 08 JV	54	110	81	0,3	3
64 09 JV	58,2	120	94	0,3	3
64 10 JV	65	130	103	0,5	3,5
64 11 JV	70,5	140	110	0,5	3,5
64 12 JV	75,5	150	115	0,5	3,5
64 13 JV	81	160	125	0,5	3,5
64 14 JV	89	180	131	0,5	3,5
64 15 JV	93	190	141	0,5	4
64 16 JV	100	200	150	0,5	4
64 17 JV	106	210	155	0,5	4
64 18 JV	112,5	225	165	0,5	4

NILOS Rings for single row angular contact ball bearings

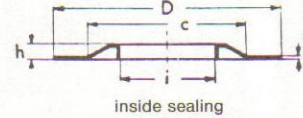


AV



outside sealing

JV



inside sealing

Bearing part number	d	D	B
70 00	10	26	8
70 01	12	28	8
70 02	15	32	9
70 03	17	35	10
70 04	20	42	12
70 05	25	47	12
70 06	30	55	13
70 07	35	62	14
70 08	40	68	15
70 09	45	75	16
70 10	50	80	16
70 11	55	90	18
70 12	60	95	18
70 13	65	100	18
70 14	70	110	20
70 15	75	115	20
70 16	80	125	22
70 17	85	130	22
70 18	90	140	24
70 00	10	26	8
70 01	12	28	8
70 02	15	32	9
70 03	17	35	10
70 04	20	42	12
70 05	25	47	12
70 06	30	55	13
70 07	35	62	14
70 08	40	68	15
70 09	45	75	16
70 10	50	80	16
70 11	55	90	18
70 12	60	95	18
70 13	65	100	18
70 14	70	110	20
70 15	75	115	20
70 16	80	125	22
70 17	85	130	22
70 18	90	140	24

NILOS Ring part number	a	d	c	s	h
70 00 AVG	23,5	10	15	0,3	1,8
70 01 AVG	25,5	12	17	0,3	1,8
70 02 AVG	29,5	15	21	0,3	2
70 03 AVG	32,7	17	24	0,3	2
70 04 AVG	36,8	20	26	0,3	2
70 05 AVG	41,8	25	33,5	0,3	2,5
70 06 AVG	47,8	30	35	0,3	2,5
70 07 AVG	56,2	35	44	0,3	2,5
70 08 AVG	62,2	40	51	0,3	2,5
70 09 AVG	69	45	55	0,3	2,5
70 10 AVG	72,7	50	57	0,3	3
70 11 AVG	82,8	55	67	0,3	3
70 12 AVG	88	60	71	0,3	3
70 13 AVG	90,8	65	75	0,3	3
70 14 AVG	103	70	83	0,3	3
70 15 AVG	108	75	89	0,3	3
70 16 AVG	117,5	80	95	0,3	3
70 17 AVG	123	85	105	0,5	3,5
70 18 AVG	129	90	106	0,5	3,5
70 00 AVH	24,3	10	15	0,3	1,8
70 01 AVH	26,3	12	17	0,3	1,8
70 02 AVH	29,5	15	21	0,3	2
70 03 AVH	32,7	17	24	0,3	2
70 04 AVH	39,5	20	25	0,3	2
70 05 AVH	44,8	25	33	0,3	2
70 06 AVH	51,5	30	40	0,3	2,5
70 07 AVH	58,8	35	44	0,3	2,5
70 08 AVH	64,8	40	48	0,3	2,5
70 09 AVH	70,7	45	54	0,3	2,5
70 10 AVH	77,8	50	61	0,3	3
70 11 AVH	85,8	55	64	0,3	3
70 12 AVH	90,8	60	75	0,3	3
70 13 AVH	95,7	65	86	0,3	3
70 14 AVH	104,8	70	85	0,3	3
70 15 AVH	110,5	75	90	0,3	3
70 16 AVH	120,5	80	100	0,5	3,5
70 17 AVH	124,8	85	94	0,5	3,5
70 18 AVH	137	90	110	0,5	3,5

NILOS Ring part number	i	D	c	s	h
70 00 JVG	12,3	26	22	0,3	1,8
70 01 JVG	15	28	23	0,3	1,8
70 02 JVG	17,5	32	27	0,3	2
70 03 JVG	19,5	35	28	0,3	2
70 04 JVG	24	42	37	0,3	2
70 05 JVG	29	47	38	0,3	2,5
70 06 JVG	35	55	46	0,3	2,5
70 07 JVG	40,2	62	52	0,3	2,5
70 08 JVG	45,3	68	57	0,3	2,5
70 09 JVG	51	75	63	0,3	2,5
70 10 JVG	56	80	67	0,3	2,5
70 11 JVG	61,5	90	74	0,3	3
70 12 JVG	64,5	95	80	0,3	3
70 13 JVG	70	100	88	0,3	3,5
70 14 JVG	77	110	90	0,3	3
70 15 JVG	82	115	95	0,3	3
70 16 JVG	86,5	125	105	0,3	3
70 17 JVG	91,5	130	110	0,5	3,5
70 18 JVG	98	140	118	0,5	3,5
70 00 JVH	12,3	26	22	0,3	1,8
70 01 JVH	15	28	23	0,3	1,8
70 02 JVH	17,5	32	27	0,3	2
70 03 JVH	19,5	35	28	0,3	2
70 04 JVH	25,7	42	37	0,3	2
70 05 JVH	31	47	39	0,3	2,5
70 06 JVH	36,3	55	47	0,3	2,5
70 07 JVH	42	62	52	0,3	2,5
70 08 JVH	46	68	57	0,3	2,5
70 09 JVH	51	75	63	0,3	2,5
70 10 JVH	56	80	67	0,3	2,5
70 11 JVH	64,5	90	80	0,3	3
70 12 JVH	70	95	85	0,3	3
70 13 JVH	72	100	84	0,3	3
70 14 JVH	77	110	90	0,3	3
70 15 JVH	82	115	95	0,3	3
70 16 JVH	86,5	125	105	0,3	3
70 17 JVH	91,5	130	110	0,5	3,5
70 18 JVH	98	140	118	0,5	3,5

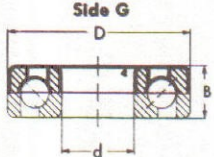
70 Series



72 Series

NILOS Rings for single row angular contact ball bearings

metric sized

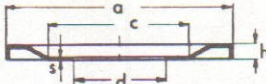


Side G

Side H

Bearing part number	d	D	B
72 00	10	30	9
72 01	12	32	10
72 02	15	35	11
72 03	17	40	12
72 04	20	47	14
72 05	25	52	15
72 06	30	62	16
72 07	35	72	17
72 08	40	80	18
72 09	45	85	19
72 10	50	90	20
72 11	55	100	21
72 12	60	110	22
72 13	65	120	23
72 14	70	125	24
72 15	75	130	25
72 16	80	140	26
72 17	85	150	28
72 18	90	160	30
72 19	95	170	32
72 20	100	180	34
72 21	105	190	36
72 22	110	200	38

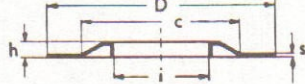
AV



outside sealing

NILOS Ring part number	a	d	c	s	h
72 00 AVG	27,5	10	18	0,3	1,8
72 01 AVG	28,1	12	20	0,3	1,8
72 02 AVG	31,8	15	22	0,3	2
72 03 AVG	35,7	17	25	0,3	2
72 04 AVG	41,2	20	29	0,3	2
72 05 AVG	47	25	36	0,3	2,5
72 06 AVG	56,2	30	44	0,3	2,5
72 07 AVG	64,8	35	48	0,3	2,5
72 08 AVG	72,7	40	57	0,3	3
72 09 AVG	77,8	45	61	0,3	3
72 10 AVG	82,8	50	67	0,3	3
72 11 AVG	90,8	55	75	0,3	3
72 12 AVG	100,8	60	85	0,3	3
72 13 AVG	110,5	65	90	0,3	3
72 14 AVG	115,8	70	95	0,3	3,5
72 15 AVG	120,5	75	100	0,5	3,5
72 16 AVG	129	80	106	0,5	3,5
72 17 AVG	138,5	85	115	0,5	3,5
72 18 AVG	148	90	124	0,5	3,5
72 19 AVG	157,5	95	130	0,5	3,5
72 20 AVG	167	100	135	0,5	4
72 21 AVG	174	105	140	0,5	4
72 22 AVG	184	110	150	0,5	4

JV



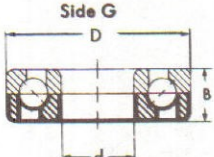
inside sealing

NILOS Ring part number	i	D	c	s	h
72 00 JVG	13,5	30	24	0,3	1,8
72 01 JVG	14,4	32	26	0,3	1,8
72 02 JVG	17,3	35	27	0,3	2
72 03 JVG	20,2	40	31	0,3	2
72 04 JVG	23,2	47	37	0,3	2
72 05 JVG	28	52	42	0,3	2,5
72 06 JVG	33	62	49	0,3	2,5
72 07 JVG	39,2	72	56	0,3	2,5
72 08 JVG	45	80	65	0,3	2,5
72 09 JVG	49,4	85	68	0,3	3
72 10 JVG	54,5	90	72	0,3	3
72 11 JVG	60	100	80	0,3	3
72 12 JVG	67	110	93	0,3	3
72 13 JVG	72,5	120	95	0,3	3
72 14 JVG	76,5	125	100	0,3	3,5
72 15 JVG	81	130	105	0,5	3,5
72 16 JVG	87,2	140	110	0,5	3,5
72 17 JVG	92,3	150	117	0,5	3,5
72 18 JVG	97,8	160	125	0,5	3,5
72 19 JVG	103	170	150	0,5	3,5
72 20 JVG	109,5	180	160	0,5	4
72 21 JVG	115	190	160	0,5	4
72 22 JVG	120	200	170	0,5	4

72 Series

NILOS Rings for single row angular contact ball bearings

metric sized

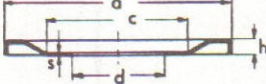


Side G

Side H

Bearing part number	d	D	B
72 00	10	30	9
72 01	12	32	10
72 02	15	35	11
72 03	17	40	12
72 04	20	47	14
72 05	25	52	15
72 06	30	62	16
72 07	35	72	17
72 08	40	80	18
72 09	45	85	19
72 10	50	90	20
72 11	55	100	21
72 12	60	110	22
72 13	65	120	23
72 14	70	125	24
72 15	75	130	25
72 16	80	140	26
72 17	85	150	28
72 18	90	160	30
72 19	95	170	32
72 20	100	180	34
72 21	105	190	36
72 22	110	200	38

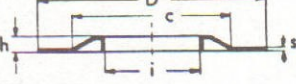
AVH



outside sealing

NILOS Ring part number	a	d	c	s	h
72 00 AVH	27,5	10	18	0,3	1,8
72 01 AVH	30	12	20	0,3	1,8
72 02 AVH	33,8	15	23	0,3	2
72 03 AVH	38	17	28	0,3	2
72 04 AVH	44,8	20	33	0,3	2
72 05 AVH	48,8	25	35	0,3	2,5
72 06 AVH	58,8	30	44	0,3	2,5
72 07 AVH	67,8	35	48	0,3	2,5
72 08 AVH	75,8	40	54	0,3	3
72 09 AVH	80,5	45	60	0,3	3
72 10 AVH	86,5	50	64	0,3	3
72 11 AVH	94,8	55	75	0,3	3
72 12 AVH	105,8	60	84	0,3	3
72 13 AVH	114,8	65	88	0,3	3
72 14 AVH	119,8	70	90	0,3	3,5
72 15 AVH	124,8	75	94	0,5	3,5
72 16 AVH	133,5	80	100	0,5	3,5
72 17 AVH	143,5	85	110	0,5	3,5
72 18 AVH	153,5	90	115	0,5	3,5
72 19 AVH	162	95	123	0,5	3,5
72 20 AVH	172	100	130	0,5	4
72 21 AVH	183	105	135	0,5	4
72 22 AVH	192	110	155	0,5	4

JVH



inside sealing

NILOS Ring part number	i	D	c	s	h
72 00 JVH	14,4	30	24	0,3	1,8
72 01 JVH	16,4	32	26	0,3	1,8
72 02 JVH	18,6	35	27	0,3	2
72 03 JVH	21,5	40	31	0,3	2
72 04 JVH	25,7	47	37	0,3	2
72 05 JVH	31,5	52	42	0,3	2,5
72 06 JVH	36,3	62	47	0,3	2,5
72 07 JVH	43	72	56	0,3	2,5
72 08 JVH	48	80	62	0,3	3
72 09 JVH	53	85	68	0,3	3
72 10 JVH	57,5	90	73	0,3	3
72 11 JVH	64,5	100	80	0,3	3
72 12 JVH	70	110	85	0,3	3
72 13 JVH	74,5	120	95	0,3	3
72 14 JVH	79,5	125	102	0,3	3,5
72 15 JVH	85	130	105	0,5	3,5
72 16 JVH	92	140	112	0,5	3,5
72 17 JVH	98	150	125	0,5	3,5
72 18 JVH	103	160	125	0,5	3,5
72 19 JVH	110	170	137	0,5	3,5
72 20 JVH	115	180	145	0,5	4
72 21 JVH	119,5	190	158	0,5	4
72 22 JVH	125,5	200	165	0,5	4

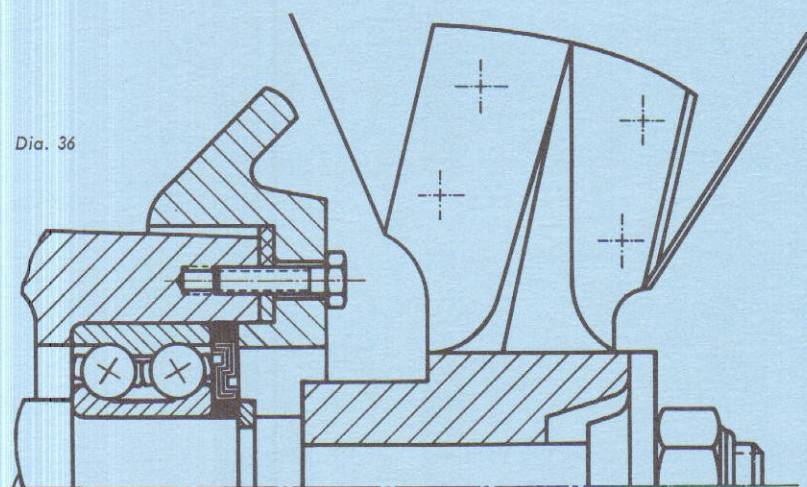
EXPLANATIONS

The NILOS Ring LSTO accomplishes in a nearly ideal manner the requirements expected from a seal for grease-lubricated anti-friction bearings. Its construction includes the following outstanding features:

1. A labyrinth system a most effective sealing device that provides exclusion of foreign matter of any kind and size.
2. The grease within the seal prevents entry of water and liquid splashing.
3. The all-steel construction is inherently durable and capable of withstanding high temperatures.
4. The inner and outer diameter of the LSTO seal correspond to the dimensions of the bearing.
5. LSTO seals have a uniform narrow width of 4 mm (0.1575") and thus require very little space to accomodate them.
6. Coefficient of friction is nearly 0; hence, LSTO seals are suitable for high speeds.
7. As the NILOS ring LSTO produces no friction of its own it does not add any heat to the assembly.
8. Any axial movements of a ball bearing have no influence on the NILOS LSTO seal.

As already outlined in the preceding points the NILOS seal LSTO is a grease-filled labyrinth seal and is delivered as a compact, self-contained, mountable unit. This seal has been developed especially for bearings which are exposed to extreme conditions. The NILOS seal LSTO has proved its efficiency to seal grease-lubricated bearings in agricultural and construction machinery, conveying equipment of all kinds, including those which are used with drying ovens, as well as in many other machines and appliances.

In general, mounting of the NILOS seal LSTO will be made directly adjacent to the bearing. The LSTO seal has to be clamped absolutely slip-tight on the side faces of the inner and outer rings of the seal. The procedure of slip-tight fitting





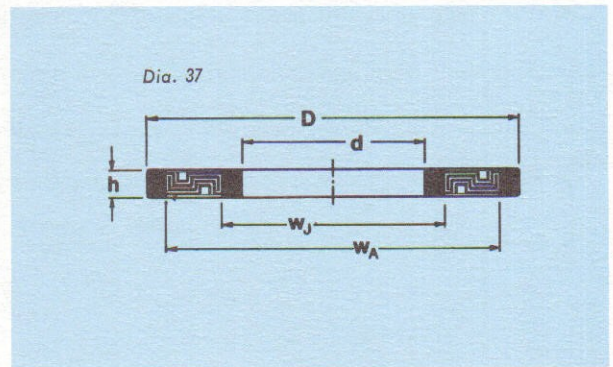
NILOS RINGS LSTO

can be accomplished by an axially threaded bushing or a spacer. In other words the LSTO seal may be positioned by axial clamping (locking rings, for instance) as well as by press-fit on the bore and outer diameter. If the LSTO seal is mounted with a proper press-fit on the bore and outer diameter additional axial clamping is unnecessary.

If axial clamping is used in mounting the NILOS seal LSTO the subsequent pressure is applied to the inner and outer steel core rings only and therefore the clamping pressure will not affect the labyrinth seal area.

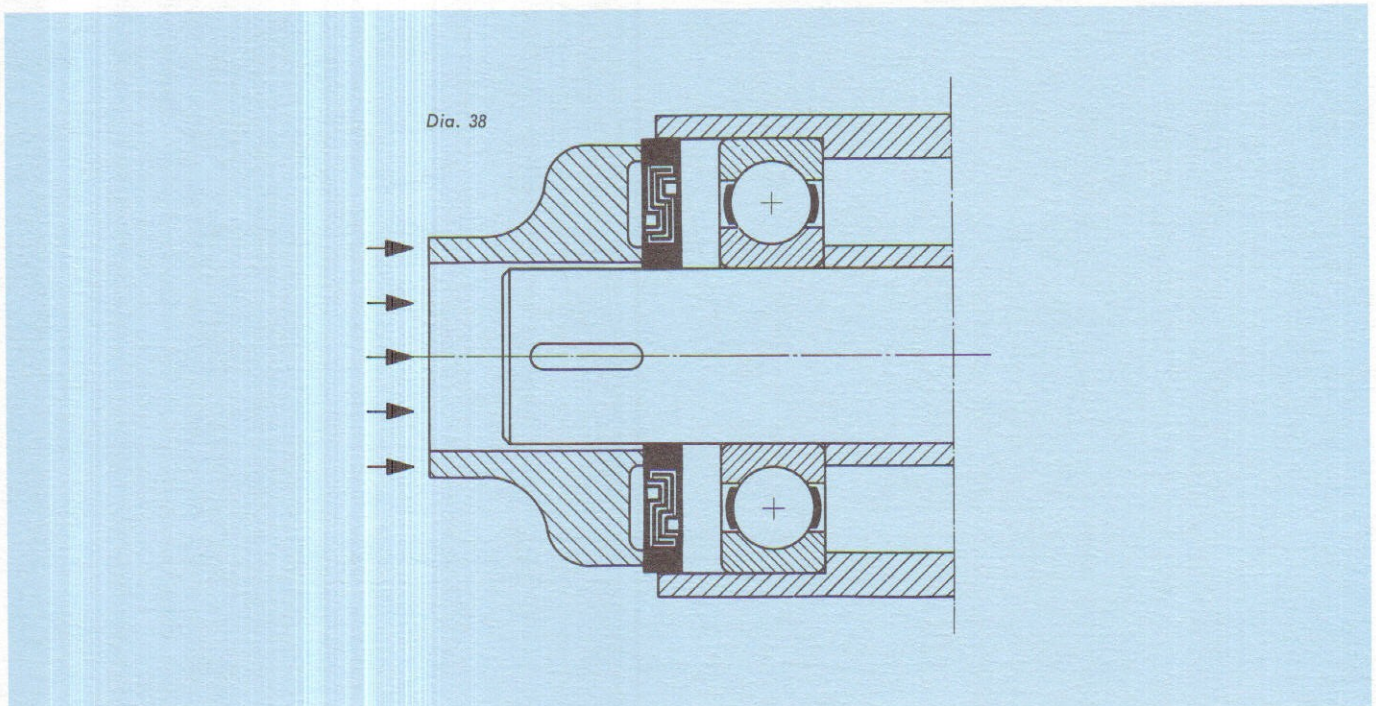
If the LSTO seal is clamped in an axial manner please pay attention to the dimensions W_A and W_J in the table so that the bushings or shoulders cannot interfere with the labyrinth area of the seal.

As further protection a NILOS Ring type AV or JV may be added to the NILOS Ring type LSTO. Should such a combination of a NILOS Ring LSTO with a NILOS Ring AV or JV be used these rings must be ordered together as, in this event, some dimensions have to be adjusted. In the application examples there is one illustration of a combination of a NILOS Ring type LSTO with a NILOS Ring type AV. (see page 13). Please consult us for additional engineering information if you have a similar application.

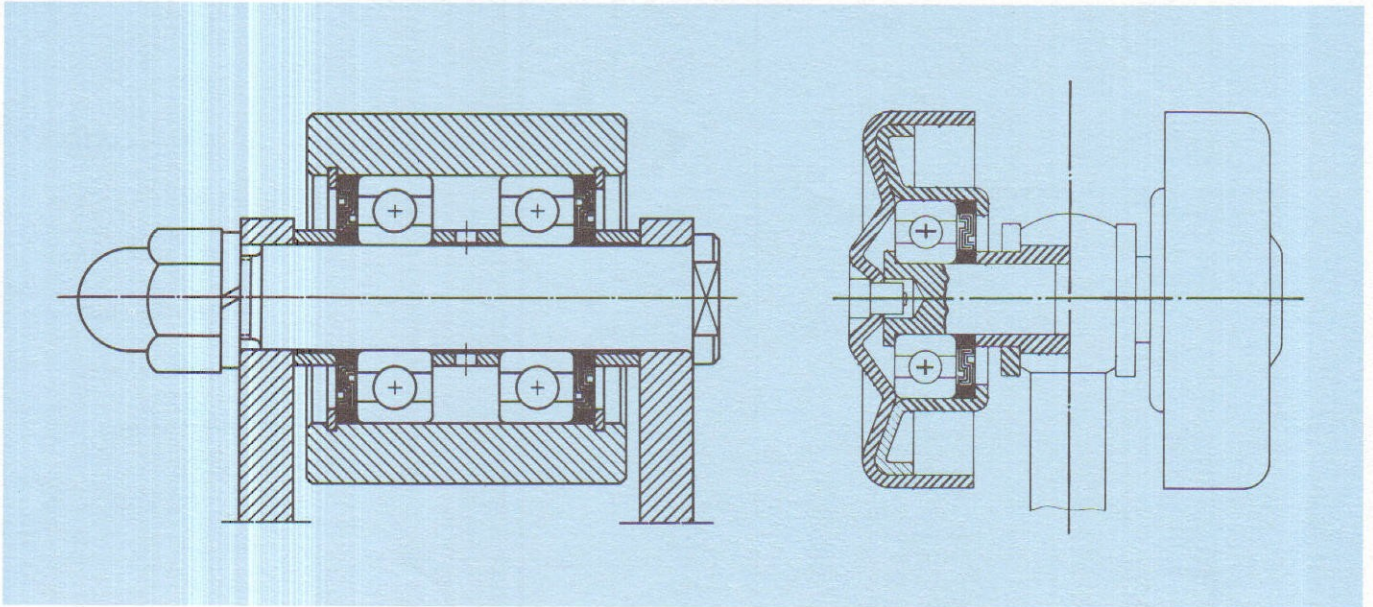


FITTING

The NILOS seal LSTO must always be mounted square to shaft and housing and must not be cocked. It is desirable to use a mounting tool. We suggest that you employ the same tool as might be used to mount the bearing. The following illustration shows the correct fitting of the NILOS seal LSTO.

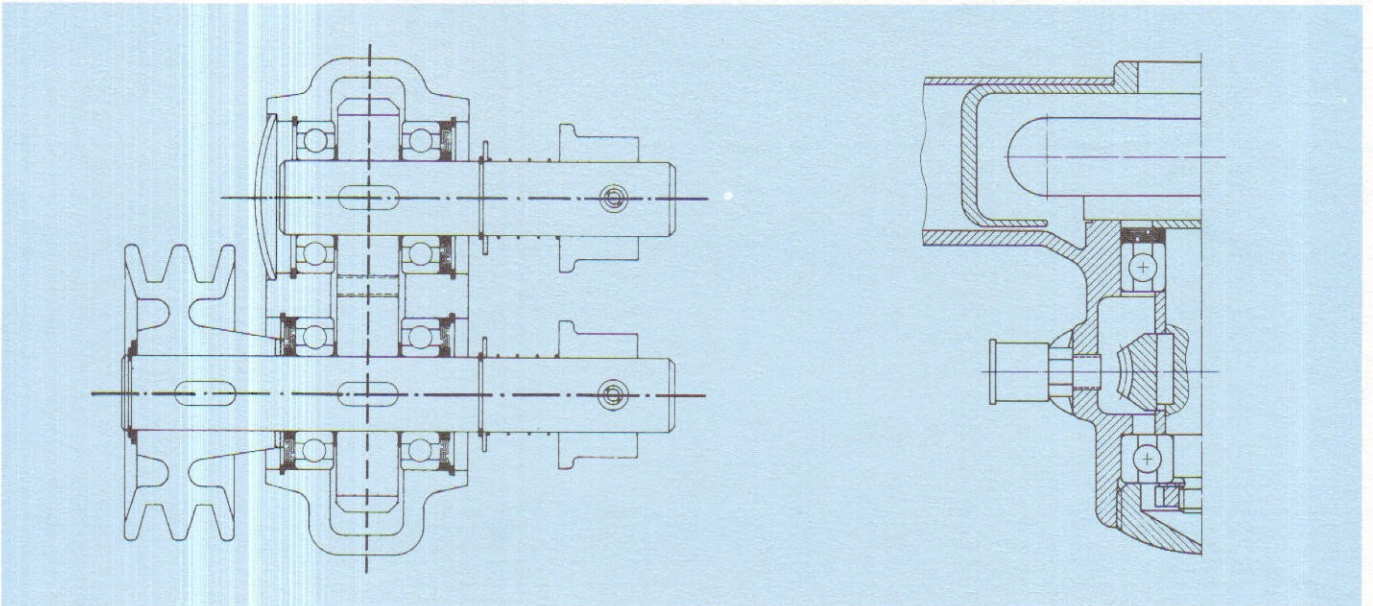


TYPICAL APPLICATIONS FOR NILOS RINGS LSTO



Dia. 39
 NILOS Rings provide a reliable sealing for chain guide rollers of circular conveyors.

Dia. 40
 Even under extreme heat, as can be the case with guide rollers NILOS Rings provide an effective maintenance-free seal.

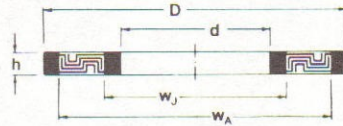


Dia. 41
 NILOS Rings have proved their efficiency in agricultural machinery and offer excellent protection on the gear box bearings of a hay rake.

Dia. 42
 Bearings of rock drilling machines are exposed to very severe conditions of extreme vibration and abrasive particles. NILOS Rings have proved their reliability of protecting the bearings on this kind of equipment.



LSTO



d Tolerance M 8	D Tolerance k 7	NILOS Ring part number	h+0,2	w _A	w _J	Fitting bearing sizes
10	30	10x 30 LSTO	4.0	25	15	NILOS Rings LSTO fit all bearing sizes having correspond- ing inner and outer diameter dimensions.
12	28	12x 28 LSTO	4.0	25	15	
15	35	15x 35 LSTO	4.0	30	20	
17	35	17x 35 LSTO	4.0	33	19	
17	40	17x 40 LSTO	4.0	34	23	
20	42	20x 42 LSTO	4.0	38	24	
20	47	20x 47 LSTO	4.0	41	26	
20	52	20x 52 LSTO	4.0	45	27	
25	47	25x 47 LSTO	4.0	43	29	
25	52	25x 52 LSTO	4.0	46	31	
25	62	25x 62 LSTO	4.0	54	33	
30	55	30x 55 LSTO	4.0	50	35	
30	62	30x 62 LSTO	4.0	56	36	
30	72	30x 72 LSTO	4.0	65	37	
35	62	35x 62 LSTO	4.0	57	40	
35	72	35x 72 LSTO	4.0	65	42	
35	80	35x 80 LSTO	4.0	71	44	
40	68	40x 68 LSTO	4.0	63	45	
40	80	40x 80 LSTO	4.0	73	47	
40	90	40x 90 LSTO	4.0	81	49	
45	75	45x 75 LSTO	4.0	70	50	
45	85	45x 85 LSTO	4.0	78	52	
45	100	45x100 LSTO	4.0	91	54	
50	90	50x 90 LSTO	4.0	83	57	
50	110	50x110 LSTO	4.0	99	61	
55	100	55x100 LSTO	4.0	91	64	
60	110	60x110 LSTO	4.0	101	69	
70	125	70x125 LSTO	4.0	116	79	
75	130	75x130 LSTO	4.0	121	84	
80	140	80x140 LSTO	4.0	129	91	

Tolerances for bore "d" and outer diameter "D"

inch sized

NILOS Ring part number	d Nominal bore	Tolerance M 8		D Nominal diameter	Tolerance k 7	
		Max. bore	Min. bore		Max. diameter	Min. diameter
10x 30 LSTO	.39370	.3937	.3929	1.18110	1.1820	1.1812
12x 28 LSTO	.47244	.4725	.4715	1.10236	1.1033	1.1024
15x 35 LSTO	.59055	.5906	.5896	1.37795	1.3790	1.3780
17x 35 LSTO	.66929	.6694	.6683	1.37795	1.3790	1.3780
17x 40 LSTO	.66929	.6694	.6683	1.57480	1.5759	1.5749
20x 42 LSTO	.78740	.7876	.7863	1.65354	1.6546	1.6536
20x 47 LSTO	.78740	.7876	.7863	1.85039	1.8515	1.8505
20x 52 LSTO	.78740	.7876	.7863	2.04725	2.0485	2.0473
25x 47 LSTO	.98425	.9844	.9831	1.85039	1.8515	1.8505
25x 52 LSTO	.98425	.9844	.9831	2.04724	2.0485	2.0473
25x 62 LSTO	.98425	.9844	.9831	2.44094	2.4422	2.4410
30x 55 LSTO	1.18110	1.1813	1.1800	2.16535	2.1666	2.1654
30x 62 LSTO	1.18110	1.1813	1.1800	2.44094	2.4422	2.4410
30x 72 LSTO	1.18110	1.1813	1.1800	2.83465	2.8359	2.8347
35x 62 LSTO	1.37795	1.3782	1.3766	2.44095	2.4422	2.4410
35x 72 LSTO	1.37795	1.3782	1.3766	2.83465	2.8359	2.8347
35x 80 LSTO	1.37795	1.3782	1.3766	3.14961	3.1509	3.1497
40x 68 LSTO	1.57480	1.5750	1.5735	2.67717	2.6784	2.6773
40x 80 LSTO	1.57480	1.5750	1.5735	3.14961	3.1509	3.1497
40x 90 LSTO	1.57480	1.5750	1.5735	3.54331	3.5448	3.5434
45x 75 LSTO	1.77165	1.7719	1.7703	2.95276	2.9540	2.9528
45x 85 LSTO	1.77165	1.7719	1.7703	3.34646	3.3480	3.3466
45x100 LSTO	1.77165	1.7719	1.7703	3.93701	3.9385	3.9371
50x 90 LSTO	1.96850	1.9687	1.9672	3.54331	3.5448	3.5434
50x110 LSTO	1.96850	1.9687	1.9672	4.33071	4.3322	4.3308
55x100 LSTO	2.16535	2.1656	2.1637	3.93701	3.9385	3.9371
60x110 LSTO	2.36220	2.3624	2.3606	4.33071	4.3322	4.3308
70x125 LSTO	2.75591	2.7561	2.7543	4.92126	4.9230	4.9214
75x130 LSTO	2.95276	2.9530	2.9512	5.11810	5.1198	5.1182
80x140 LSTO	3.14961	3.1498	3.1480	5.51180	5.5135	5.5119