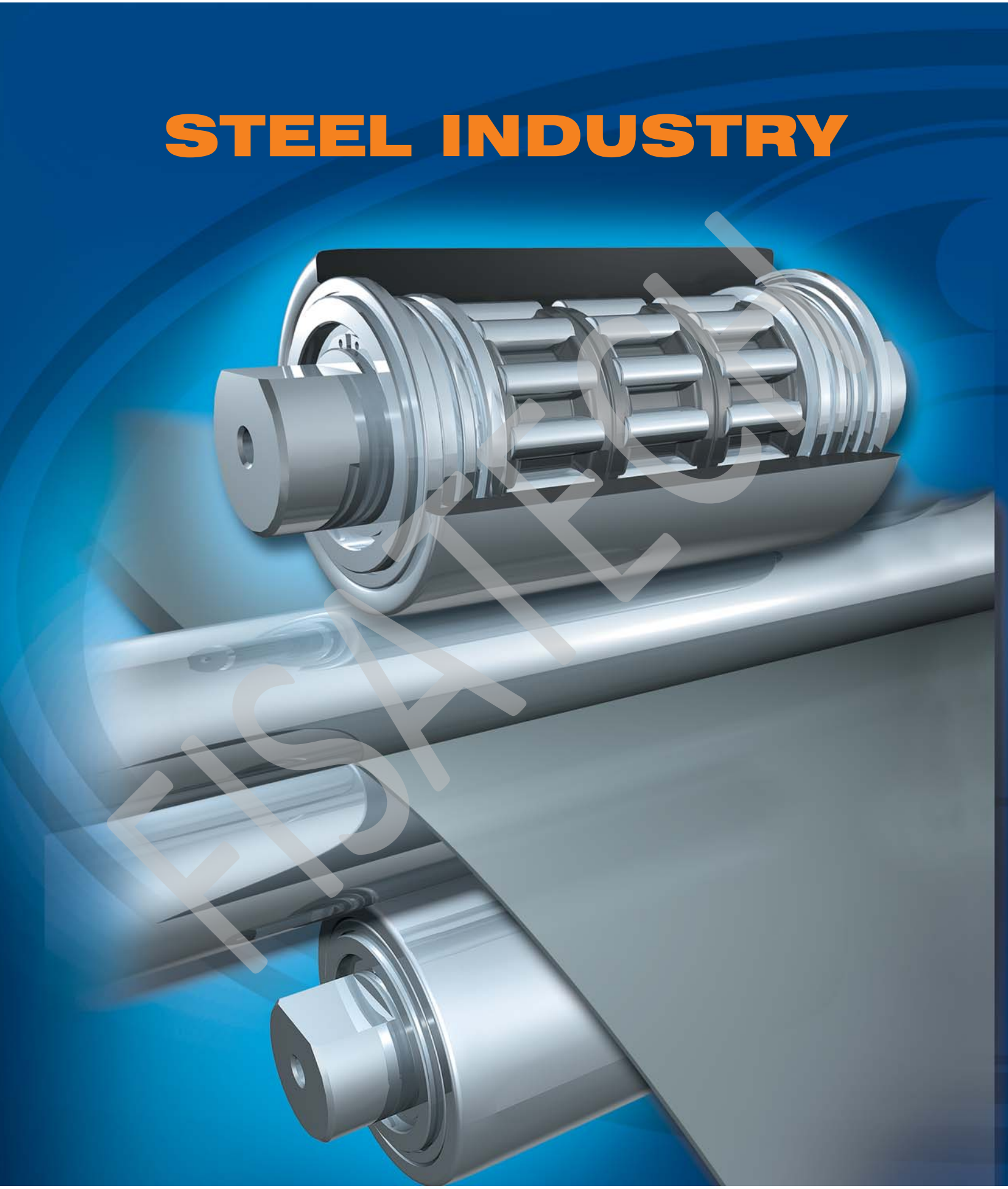
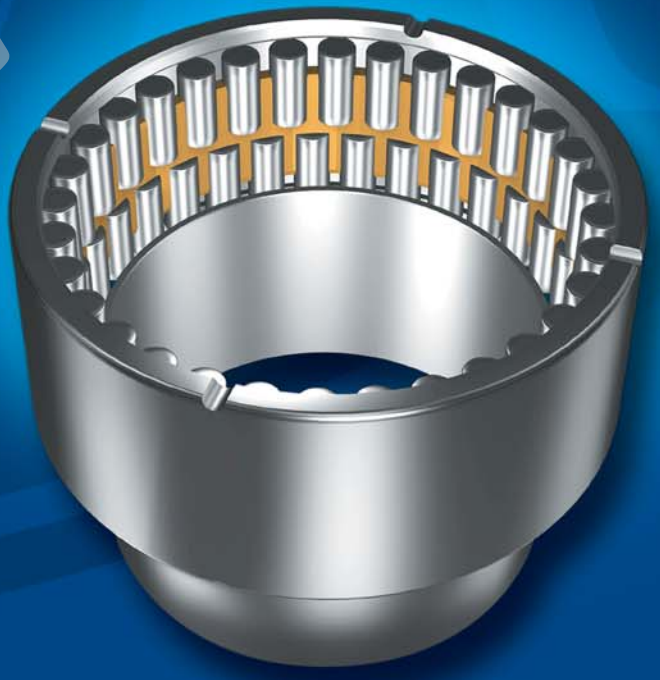
STEEL INDUSTRY

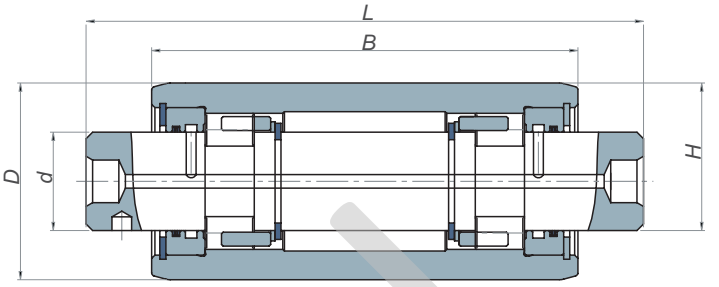




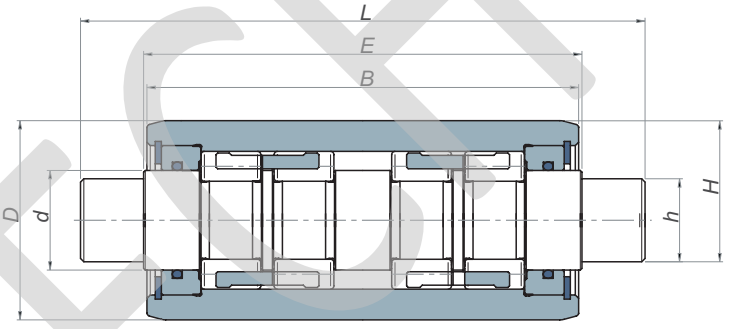
BACK-UP ROLLERS WITH PIVOT
FOR METAL FLATTENING MACHINES

Back-up rollers for metal flattening machines are made in two different executions:
- full complement of cylindrical rollers
- with roller cages in mould steel or bronze.

The full complement execution allows the bearing to reach a high load capacity both dynamic and static.
The wide working surface, along with the rolling system, made of two or more cages, allow the plant to reach very high flattening performance and high speed.
The distance rings, which are obtained entirely on the outer ring and on the pivot, and the circle clearance, which is calculated at the minimum, allow a good support of axial loads.
The execution with roller cages represent the most advanced series of back-up rolls.
This series of back-up rollers is usually manufactured with two lateral thrust bearings in the inner body, either with balls or rollers, which guarantee a very strong support of axial loads.



Execution with 2 rows of rollers



Execution with 4 rows of rollers

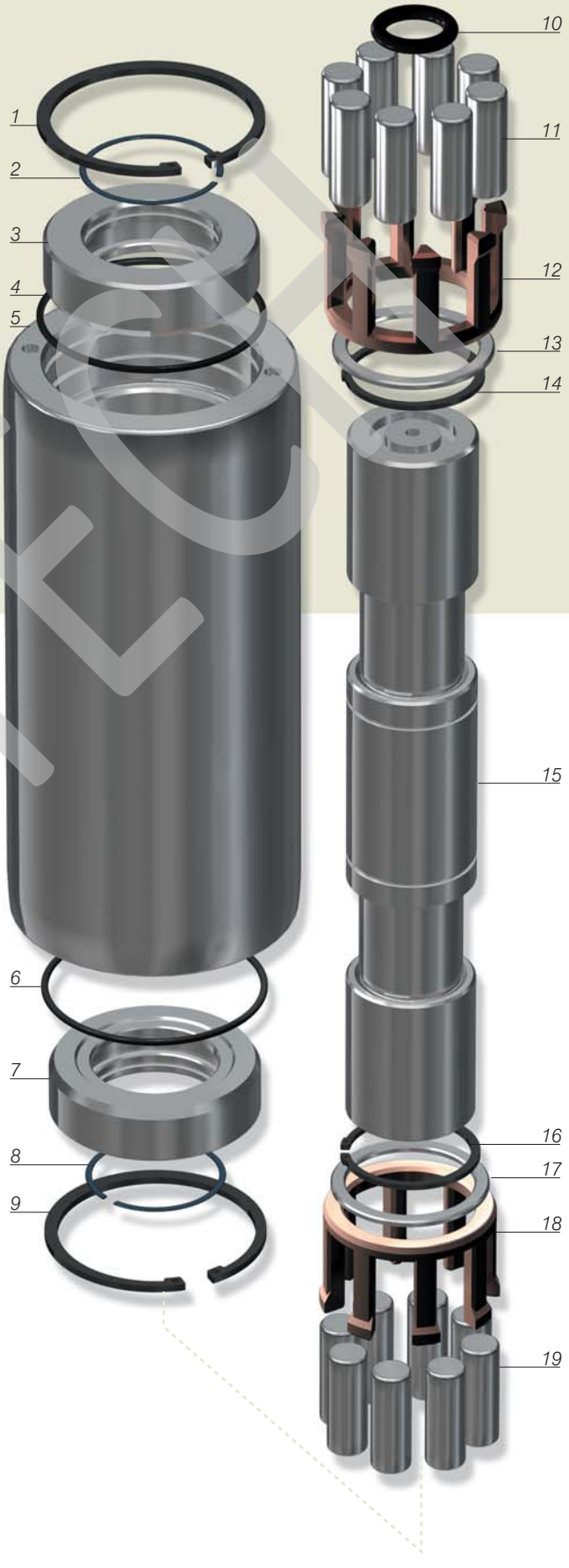
Ref.	outer Ø mm.	Reference	D mm.	d mm.	L mm.	B mm.	E mm.	h mm.	PDA seals	Rows of rollers	Cages	C_w KN	C_{ow} KN
300-0001	24,5	CRAT 24.5X12X75	24,5	12	75	41	43	-	-	2	•	10	16,8
300-0002	33	CRAT 33X19X90	33	19	90	57	58	-	-	2	•	18	33
300-0003	47	CRAT 47X20X155	47	20	155	125	126	-	-	4	•	57,2	65,9
300-0004	47	CRAT 47X22X145	47	22	145	115	-	21	-	2	•	46,4	49,2
300-0005	50	CRAT 50X20X165	50	20	166	128	130	-	•	4	-	69,1	83,2
300-0006	52	CRAT 52X20X55	52	20	55	24	27,4	-	-	2	•	33	43
300-0007	52	CRAT 52X20X125	52	20	125	94	95	-	-	4	•	65,1	77,7
300-0008	55	CRAT 55X25X159.5	55	25	159,5	125	-	21	-	4	•	100,4	131,8
300-0009	60	CRAT 60X25X90	60	25	90	50	52	-	•	2	•	36,2	43
300-0010	60	CRAT 60X25X160	60	25	160	130	132	-	•	2	•	71,3	84,3
300-0011	60	CRAT 60X25X170	60	25	170	130	132	-	•	2	•	71,3	84,3
300-0012	60	CRAT 60X30X151.25	60	30	151,25	109,25	111,3	27	•	2	•	70,2	82
300-0013	60	CRAT 60X30X189	60	30	189	160,3	-	25	-	2	•	72,4	85,3
300-0014	60	CRAT 60X30X201	60	30	201	160,3	-	-	•	2	•	72,4	85,3
300-0015	60	CRAT 60X30X202	60	30	202	160,3	162	27	•	2	•	72,4	85,3
300-0016	65	CRAT 65X25X198	65	25	198	156	168	21,5	-	4	-	124,2	170,6
300-0017	75	CRAT 75X40X165	75	40	165	140	143	29,5	-	4	-	149	208,5
300-0018	76	CRAT 76X40X165	76	40	165	140	143	30	-	4	•	152,3	213,8
300-0019	80	CRAT 80X35X201	80	35	201	160,3	-	-	•	2	•	111,2	115,6
300-0020	80	CRAT 80X35X210	80	35	210	170	-	-	•	2	•	111,2	115,6
300-0021	80	CRAT 80X35X230	80	35	230	200	-	30,5	-	2	•	114,5	118,8
300-0022	80	CRAT 80X35X302.5	80	35	302,5	261,8	-	-	•	2	•	111,2	115,6
300-0023	80	CRAT 80X40X180	80	40	180	140	143	-	•	4	•	127,5	171,7
300-0024	80	CRAT 80X40X210	80	40	210	150	156	-	-	4	-	136	188
300-0025	90	CRAT 90X45X134.3	90	45	134,3	100	102	-	•	2	-	139,3	167,4
300-0026	90	CRAT 90X45X140	90	45	140	100	102	-	•	2	•	157,7	195,5
300-0027	95	CRAT 95X45X288	95	45	288	236	240	-	•	2	•	173,9	229
300-0028	95	CRAT 95X45X362	95	45	362	310	314	-	•	2	•	179,3	238,7
300-0029	100	CRAT 100X45X245	100	45	245	200	201,4	-	•	2	•	175	231,1
300-0030	100	CRAT 100X45X246	100	45	246	200	201,4	-	•	2	•	175	231,1
300-0031	100	CRAT 100X45X246	100	45	246	200	201,4	-	•	4	-	280,8	415,8
300-0032	134	CRAT 134X55X146	134	55	146	83	85	50	•	2		227,9	315

C_w *Dynamic load* C_{ow} *Static load*

BACK-UP ROLLERS WITH PIVOT
FOR METAL FLATTENING MACHINES

1. *SEEGER LOCKING RING*
2. *FEY SEAL RING*
3. *SUPPORT THRUST RING*
4. *O-RING SEAL*
5. *OUTER RING*
6. *O-RING SEAL*
7. *SUPPORT THRUST RING*
8. *FEY SEAL RING*
9. *SEEGER LOCKING RING*
10. *O-RING SEAL*
11. *CYLINDRICAL ROLLERS*
12. *CAGE*
13. *SUPPORT LITTLE THRUST RING*
14. *SEEGER SEAL RING*
15. *PIVOT*
16. *SEEGER SEAL RING*
17. *SUPPORT LITTLE THRUST RING*
18. *CAGE*
19. *CYLINDRICAL ROLLERS*

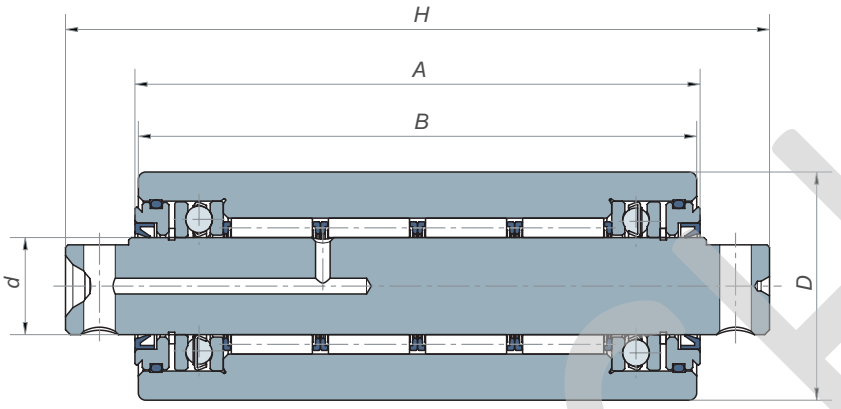
- *the bearings are supplied with 2ZL seals or PP seals, on request*
- *the back-up rolls are grease lubricated according to DIN 51825*
- *Air filling is provided for PDA execution*
- *Dimension H is selected in groups of 0.008 mm*



Back-up rollers with pivot for metal flattening machines have the following characteristics:

- The outer ring is supplied in UNI 100Cr6/100CrMo7 core hardened steel that can reach hardness 60-2 HRC.
- Once seen the condition of coupling with working cylinders, the degree of hardness can be reduced to 53÷58 on request.
- The profile of the outer ring is usually cambered in order to optimize the distribution of the applied load.
- The pivot is made in two different steel types, according to dimension and shape:
  1) core hardened steel UNI 100 Cr6/100 CrMo7;
  2) case hardened steel UNI 18 NiCrMo5.
  In both cases the degree of hardness is 60-HRC.
- The bearings have a grease lubrication system and are supplied already pre-lubricated. The lubrication system foresees both the entrance and the exit of grease. They can be supplied also in Long-life execution.
- The sealing system is very efficient, it does not allow outer agents (such as, dust, mill scale, humidity) to enter the back-up roll; at the same time, it prevents the leakage of grease.
- Precision class P0; on request the rollers can be manufactured with precision class P5 (DIN 620) and selected in groups.
- On request, they can be manufactured in stainless steel.

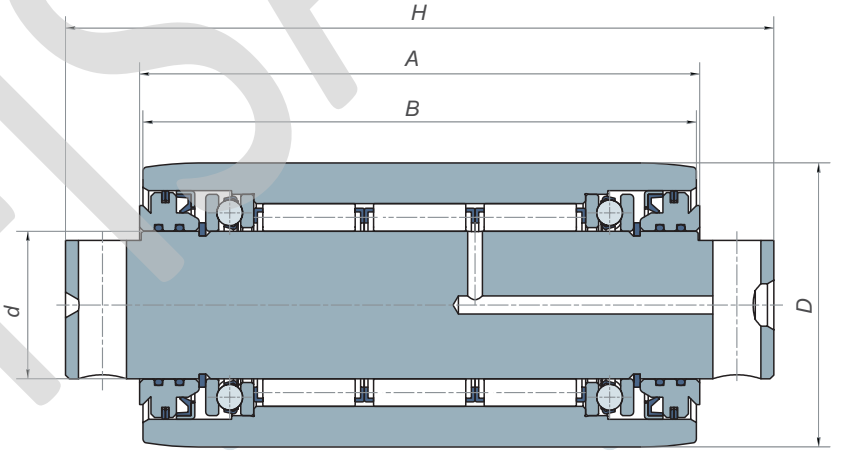
BACK-UP ROLLERS
WITH PIVOT *(900-2469/2)*



ref.	d	D	H	A	B	C	C_o	C_w	C_{ow}	Max speed
	mm	mm	mm	mm	mm	KN	KN	KN	KN	RPM min^{-1}
900-2469/2	20	47	145	116.6	115	102.2	124.5	87	105	5.600

Bearing	C	Dynamic load	C_o	Static load
Roller	C_w	Dynamic load	C_{ow}	Static load

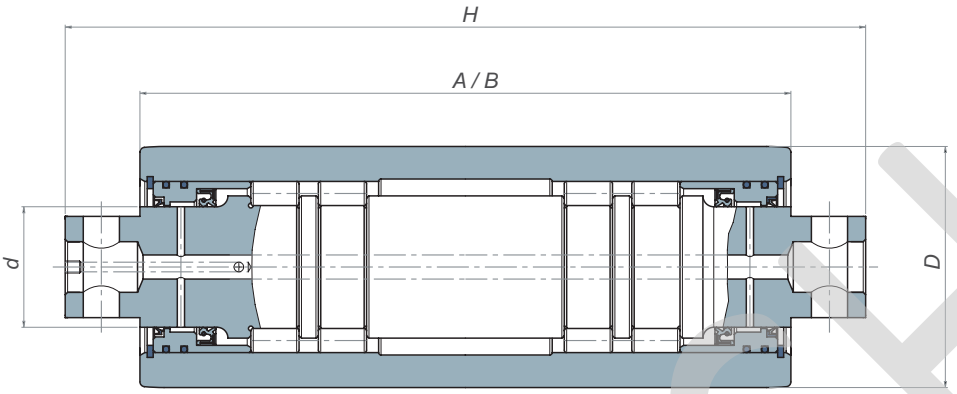
BACK-UP ROLLERS
WITH PIVOT *(900-2721)*



ref	d	D	H	A	B	C	C_o	C_w	C_{ow}	Max speed
	mm	mm	mm	mm	mm	KN	KN	KN	KN	RPM min^{-1}
900-2721	40	74	192	151.8	150	194	258	155	205	4.000

Bearing	C	Dynamic load	C_o	Static load
Roller	C_w	Dynamic load	C_{ow}	Static load

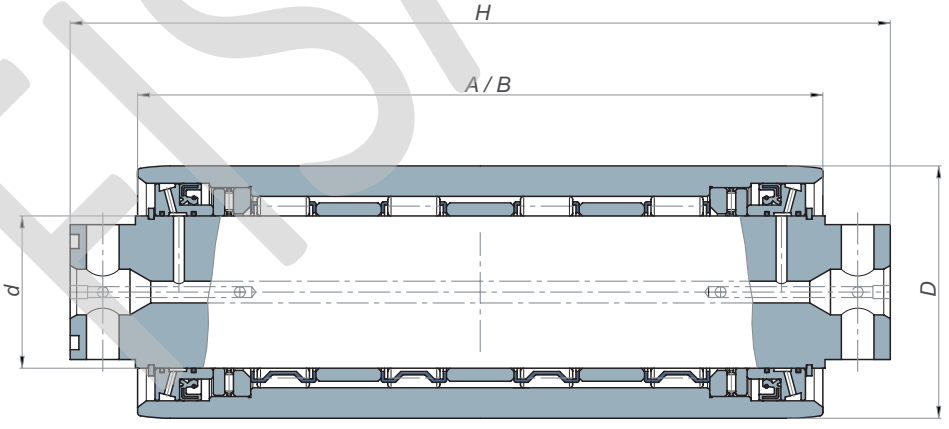
BACK-UP ROLLERS
WITH PIVOT *(900-2863)*



ref.	d	D	H	A	B	C	C_o	C_w	C_{ow}	Max speed
	mm	mm	mm	mm	mm	KN	KN	KN	KN	RPM min^{-1}
900-2863	50	100	332	270	270	300	561	270	480	1.000

Bearing	C	Dynamic load	C_o	Static load
Roller	C_w	Dynamic load	C_{ow}	Static load

BACK-UP ROLLERS
WITH PIVOT *(900-2752/2)*



ref.	d	D	H	A	B	C	C_o	C_w	C_{ow}	Max speed
	mm	mm	mm	mm	mm	KN	KN	KN	KN	RPM min^{-1}
900-2752/2	70	120	377	317	315	440	798	333	510	2.500

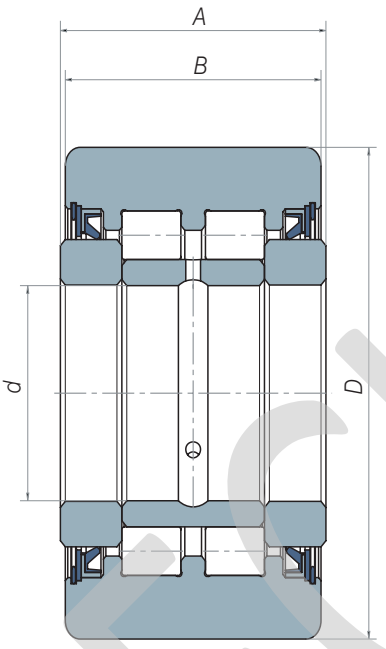
Bearing	C	Dynamic load	C_o	Static load
Roller	C_w	Dynamic load	C_{ow}	Static load

BACK-UP ROLLERS
WITHOUT PIVOT

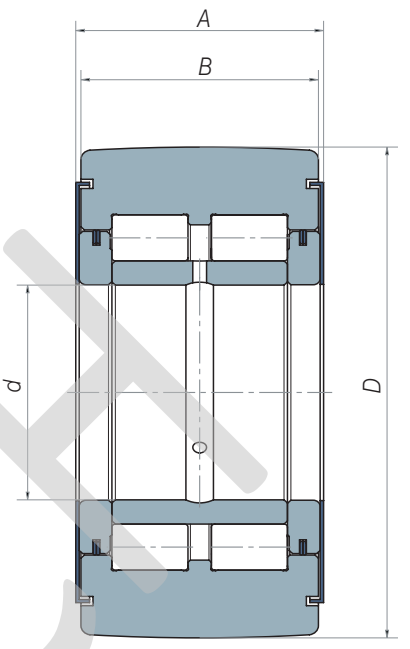
The series of back-up rollers without pivot is manufactured with two or more full-complement-cylindrical-roller rows; they are separated by spacers obtained entirely on the outer ring.

These bearings are particularly used on machines that work continuously and in extremely tough conditions, because of their high dynamic and static load capacity.

The spacers between the rolling raceways guarantee the bearing of the axial thrusts.



Execution with tightness



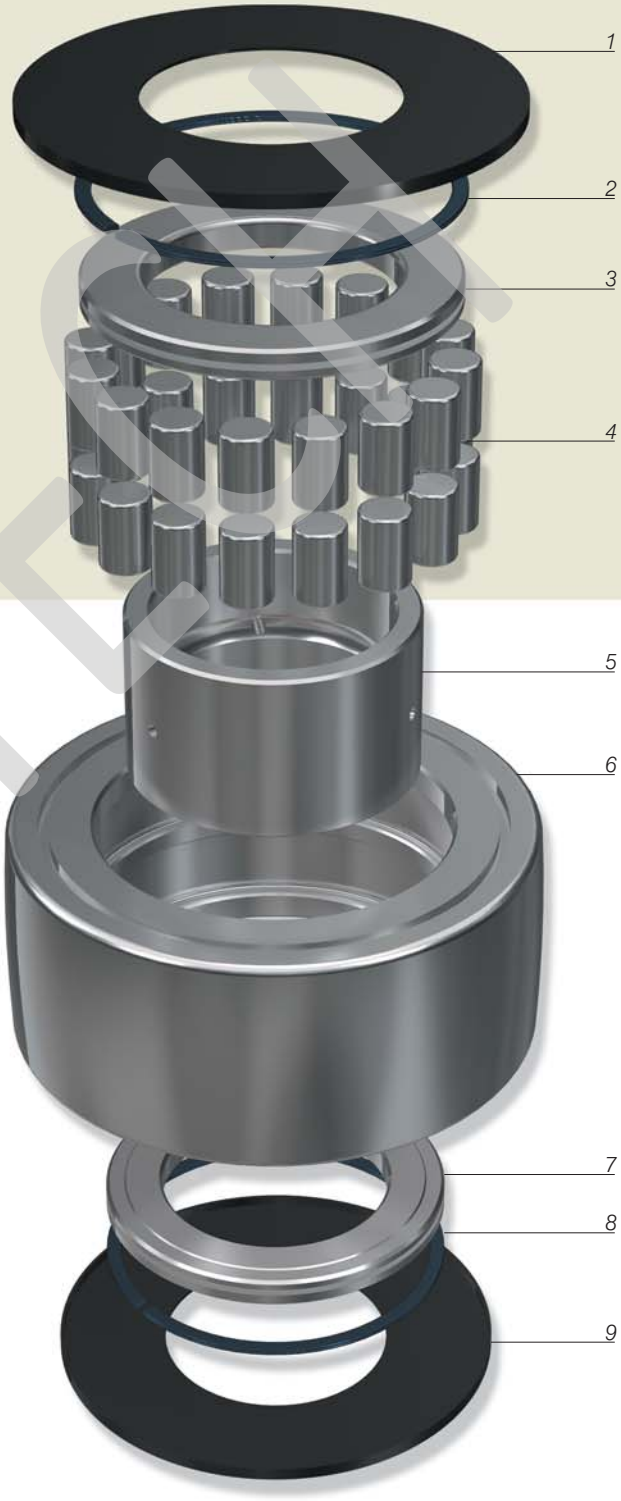
Execution with Fey

ref.	d	D	A	B	C	C_o	C_w	C_{ow}	Max speed
	mm	mm	mm	mm	KN	KN	KN	KN	RPM min^{-1}
900-1907	20	48	36	27	38	56	32	47	2000
900-2742	25	52	44	42	48	80	40	61	1500
900-2744	25	60	50	48	71	108	60	91	1500
900-1857	25	65	45	41	80	111	68	95	1300
900-2323	30	72	42	40	70	100	59	94	1300
200-1741	25	74	50	47	99	139	84	118	1400
900-2741	35	80	54	50	92	134	78	114	1200
200-1197	35	80	48	44	100	161	87	137	1100
200-0059	40	90	35	32	74	102	63	87	900
900-2030	40	95	55	51	124	192	107	163	1000
200-1198	50	105	60	56	189	314	162	268	900
900-2012	50	120	70	66	231	390	195	330	900
900-2011	50	130	70	66	260	365	221	310	700
200-0695	55	140	60	56	227	375	193	320	600
200-0696	70	150	63	61	287	475	245	402	600
200-0697	65	160	71	67	286	452	243	385	600
900-1966	90	180	102	98	493	1107	420	940	500
900-2008	90	200	92	88	525	890	446	756	500
900-2270/1	90	220	120	117	655	1182	556	1005	500
900-2312	120	250	124	121	878	1687	745	1433	400
900-1967	120	280	124	121	892	1665	758	1415	400

Bearing	C	Dynamic load	C_o	Static load
Roller	C_w	Dynamic load	C_{ow}	Static load

BACK-UP ROLLERS
WITHOUT PIVOT

1. SEAL SHEET
2. FEY SEAL RING
3. SUPPORT THRUST RING
4. CYLINDRICAL ROLLERS
5. INNER RING
6. OUTER RING
7. SUPPORT THRUST RING
8. FEY SEAL RING
9. SEAL SHEET



Back-up rollers without pivot have the following technical characteristics:

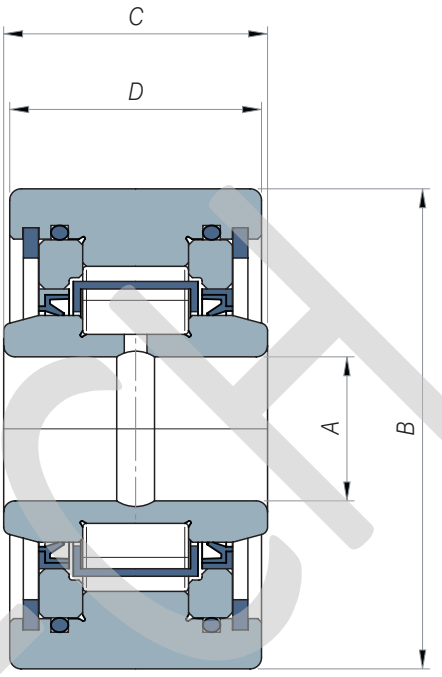
- The inner rings and the outer rings are manufactured in UNI 100Cr6 core hardened steel, with hardness 60±2 HRC. The outer ring has a cambered radius on the outer diameter; this allows to improve the distribution of the loads during functioning.
- Back-up rollers with surface hardness of the outer ring reduced to 53÷58 HRC can be supplied on request.
- Inner ring with holes and grooves for the inflow of the lubricant.
- Full-complement of cylindrical rollers to ensure the highest possible load capacity.
- Double system of protection and tightness, through shields and sealing spring rings made of steel. The sealing system can be also with lip shearing rubber seals.
- The tolerances during execution are according normal class P0; special execution according class P5 (DIN 620) can be manufactured on request .
- On request, they can be manufactured in stainless steel.

SINGLE CYLINDRICAL **BACK-UP ROLLERS** (EXECUTION IN INCHES)

The single cylindrical back-up roller executed in inches is manufactured as alternative to the same series with tapered rollers.
The bearing is extremely tough and massive; it is made of one outer ring – which makes a unique body, once linked to the lateral thrust rings – and of an inner ring with entire borders, from which the rolling raceway comes out.

This series can be manufactured with cages or with full-complement of cylindrical rollers.
This back up roller is particularly suitable to work with high radial loads; thanks to its toughness, it maintains all its primary technical characteristics for a long flattening lifetime.

The entire borders made from the inner ring allow to bear the axial thrusts.



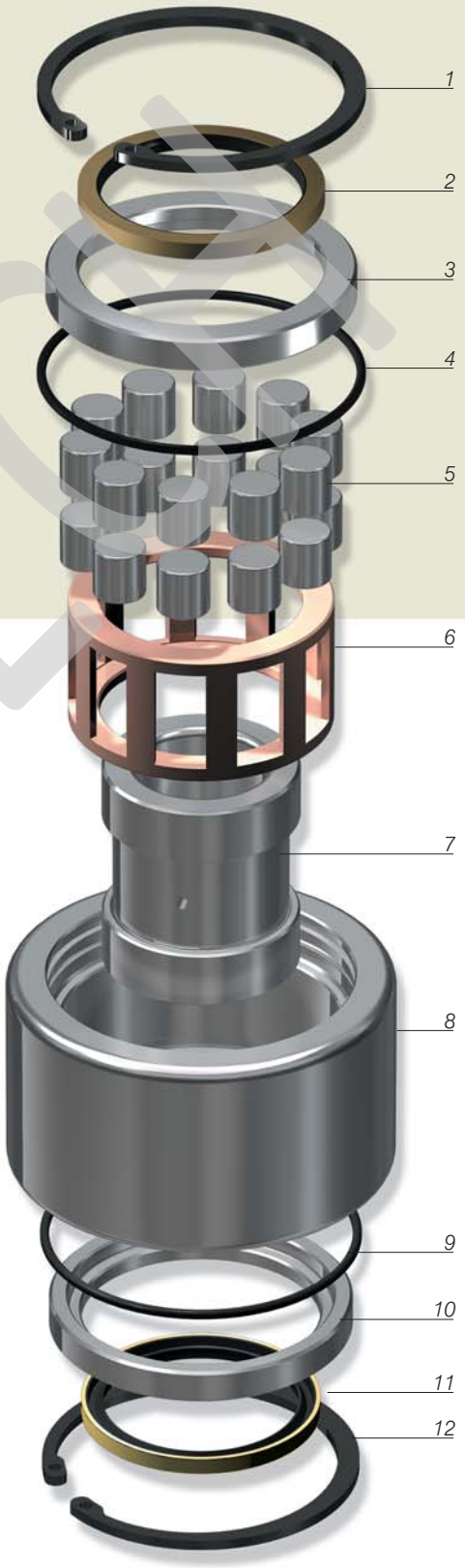
ref.	A	B	C	D	C_w
	mm./inch	mm./inch	mm./inch	mm./inch	Radial N/Lbf
100-0001	7.938	28.575	22.225	21.463	8970
100-0001	0.3125	1.1250	0.8750	0.8450	2016
100-0002	11.113	38.100	28.578	26.988	14340
100-0002	0.4375	1.5000	1.1251	1.0625	3240
100-0003	12.700	41.275	28.578	26.988	16500
100-0003	0.500	1.6250	1.1251	1.0625	3720
100-0004	12.700	44.450	28.578	26.988	16500
100-0004	0.500	1.7500	1.1251	1.0625	3720
100-0005	15.875	50.800	36.515	34.925	30000
100-0005	0.6250	2.0000	1.4376	1.3750	6780
100-0006	15.875	52.388	36.515	34.925	30000
100-0006	0.6250	2.0625	1.4376	1.3750	6780
100-0007	15.875	53.975	36.515	34.925	30000
100-0007	0.6250	2.1250	1.4376	1.3750	6780
100-0008	19.050	57.150	34.928	33.338	33600
100-0008	0.7500	2.2500	1.3751	1.3125	7530
100-0009	19.050	63.500	34.928	33.338	33600
100-0009	0.7500	2.5000	1.3751	1.3125	7530
100-0010	20.638	76.200	48.423	46.883	54600
100-0010	0.8125	3.0000	1.9064	1.8438	12300
100-0011	30.005	85.725	50.800	49.213	63300
100-0011	1.1813	3.3750	2.0000	1.9375	14250
100-0012	30.005	88.900	50.800	49.213	63300
100-0012	1.1813	3.5000	2.0000	1.9375	14250
100-0013	38.100	101.600	58.735	57.150	94800
100-0013	1.5000	4.0000	2.3124	2.2500	21300
100-0014	38.100	107.950	58.735	57.150	94800
100-0014	1.5000	4.2500	2.3124	2.2500	21300
100-0015	44.450	127.000	66.673	65.088	159000
100-0015	1.7500	5.0000	2.6249	2.5625	35700
100-0016	44.450	127.000	71.438	65.088	159000
100-0016	1.7500	5.0000	2.8125	2.5625	35700
100-0017	50.800	120.650	69.850	68.265	162600
100-0017	2.0000	4.7500	2.7500	2.6876	36600
100-0018	50.800	127.000	69.850	68.265	162600
100-0018	2.0000	5.0000	2.7500	2.6876	36600
100-0019	53.975	120.650	69.850	68.265	162600
100-0019	2.1250	4.7500	2.7500	2.6876	36600

ref.	A	B.	C	D	C_w
	mm./inch	mm./inch	mm./inch	mm./inch	Radial N/Lbf
100-0020	53.975	127.000	69.850	68.265	162600
100-0020	2.1250	5.0000	2.7500	2.6876	36600
100-0021	53.975	152.400	69.850	68.265	162600
100-0021	2.1250	6.0000	2.7500	2.6876	36600
100-0022	60.000	142.875	65.090	73.025	179700
100-0022	2.3622	5.6250	2.5626	2.8750	40500
100-0023	60.000	149.225	65.090	73.025	179700
100-0023	2.3622	5.8750	2.5626	2.8750	40500
100-0024	69.850	177.800	69.850	69.058	179700
100-0024	2.7500	7.0000	2.7500	2.7188	40500
100-0025	70.000	149.225	74.615	73.025	179700
100-0025	2.7559	5.8750	2.9376	2.8750	40500
100-0026	70.000	158.750	74.615	73.025	179700
100-0026	2.7559	6.2500	2.9376	2.8750	40500
100-0027	70.000	159.974	74.615	73.025	179700
100-0027	2.7559	6.2982	2.9376	2.8750	40500
100-0028	70.000	177.800	74.615	73.025	179700
100-0028	2.7559	7.0000	2.9376	2.8750	40500
100-0029	70.000	199.974	74.615	76.200	179700
100-0029	2.7559	7.8730	2.9376	3.0000	40500
100-0030	70.000	203.200	74.615	76.200	179700
100-0030	2.7559	8.0000	2.9376	3.0000	40500
100-0031	70.000	228.600	74.615	76.200	179700
100-0031	2.7559	9.0000	2.9376	3.0000	40500
100-0032	71.438	177.800	98.422	96.838	339000
100-0032	2.8125	7.0000	2.8749	3.8125	75900
100-0033	85.725	158.750	73.025	71.435	193800
100-0033	3.3750	6.2500	2.8750	2.8124	43500
100-0034	85.725	203.200	73.025	71.435	193800
100-0034	3.3750	8.0000	2.8750	2.8124	43500
100-0035	88.900	206.375	104.775	103.185	411000
100-0035	3.5000	8.1250	4.1250	4.0624	92100
100-0036	88.900	249.974	92.075	101.600	270900
100-0036	3.5000	9.8415	3.6250	4.0000	60900
100-0037	88.900	250.825	92.075	101.600	270900
100-0037	3.5000	9.8750	3.6250	4.0000	60900
100-0038	101.600	260.350	136.525	133.350	669000
100-0038	4.0000	10.2500	5.3750	5.2500	150300

C_w Dynamic load

SINGLE CYLINDRICAL **BACK-UP ROLLERS** (EXECUTION IN INCHES)

1.	*SEEGER SEAL RING*
2.	*ZRS SEAL RING*
3.	*SUPPORT THRUST RING*
4.	*O-RING SEAL*
5.	*CYLINDRICAL ROLLERS*
6.	*CAGE*
7.	*INNER RING*
8.	*OUTER RING*
9.	*O-RING SEAL*
10.	*SUPPORT THRUST RING*
11.	*ZRS SEAL RING*
12.	*SEEGER SEAL RING*



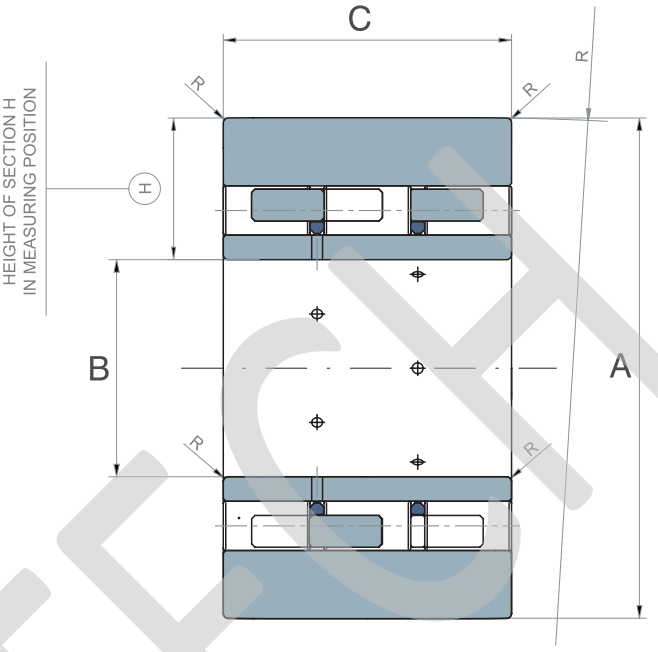
The single back-up roller with cylindrical rollers (execution in inches) has the following characteristics:

- The outer ring and the inner ring are manufactured in case hardened UNI 100Cr6/SAE 52100 steel.
- They reach hardness degree of 60+2 HRC.
- Usually, the cages are made in bronze; in some cases, when the dimensions are small, the cage can be manufactured in press-forged sheet.
- The sealing system is highly efficient, because it prevents outer agents (dust, mill scale and humidity) to enter the back-up roller; at the same time it prevents the leakage of grease. Grease lubrication is made through a groove on the inner ring.
- Precision class P0. It can be manufactured with precision class P5, on request.
- On request, they can be manufactured in stainless steel.

SHOULDER BEARINGS
FOR SENDZIMIR STEEL MILLS

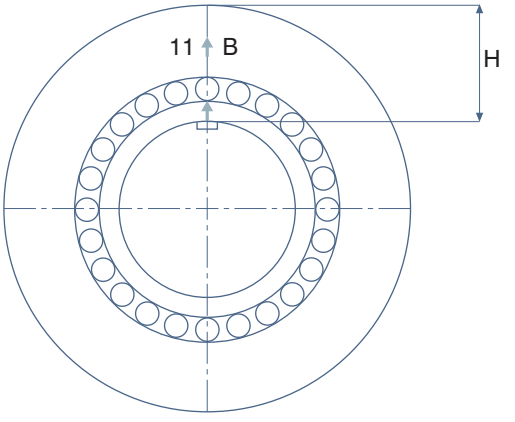
Shoulder bearings have been projected on purpose for Sendzimir cold steel mills; they can be used also in straightening or flattening machines. Shoulder bearings show different shapes in construction, in order to fulfil several application requirements.

Cylindrical roller shoulder bearings can have up to 4 rows of rollers, with cages or without cages. They have the advantage of having a simple shape and a high radial load capacity. Some series are manufactured with entire edges obtained on the outer ring, other series are without entire parts, with distance rings and lateral thrust rings.



Outer diameter (mm)	*from*	*110*	*to*	*406,42*
Inner diameter (mm)	*from*	*50*	*to*	*180*
Thickness (mm)	*from*	*52*	*to*	*224*

Section height groups	*Tolerances on section height "H" (mm)*	
A	*0*	*- 0.005*
B	*- 0.005*	*- 0.010*
C	*- 0.010*	*- 0.015*
4	*0*	*- 0.002*
3	*- 0.002*	*- 0.004*
2	*- 0.004*	*- 0.006*
1	*- 0.006*	*- 0.008*
0	*- 0.008*	*- 0.010*



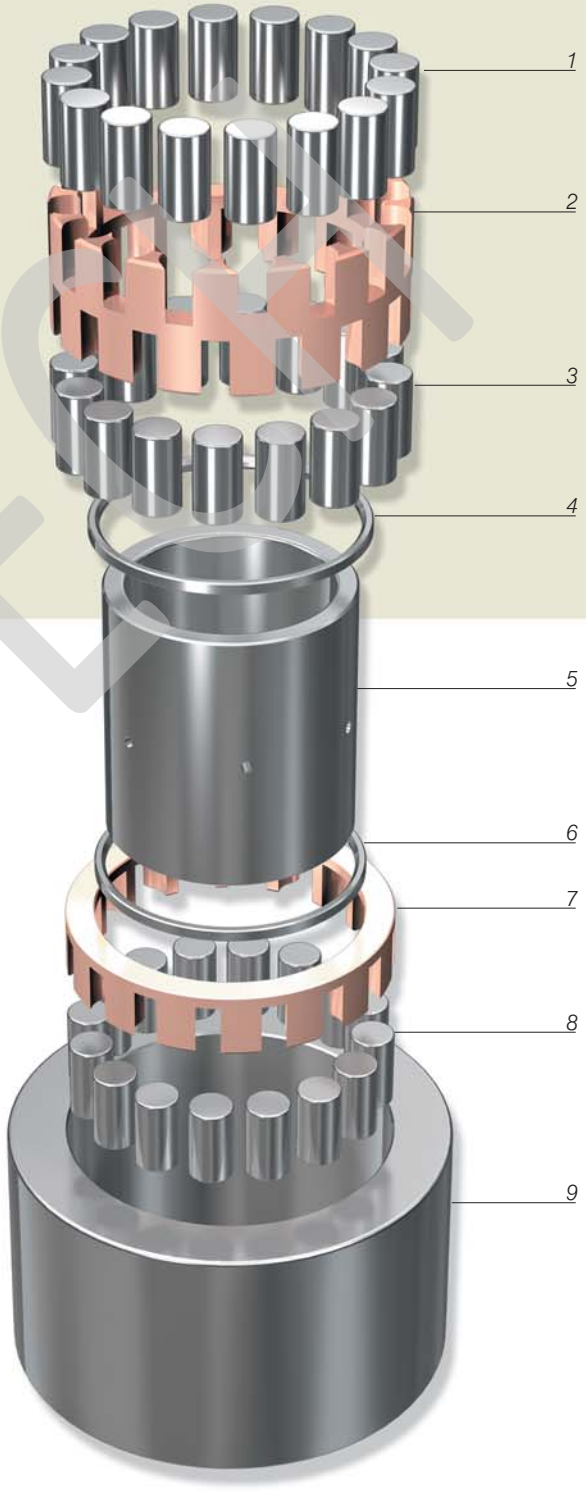
↑ = Point of maximum thickness of the ring

11 = Order nr. (example)

B = Section height group (example)

SHOULDER BEARINGS
FOR SENDZIMIR STEEL MILLS

1. CYLINDRICAL ROLLERS
2. CAGE
3. CYLINDRICAL ROLLERS
4. DISTANCE RING
5. INNER RING
6. DISTANCE RING
7. CAGE
8. CYLINDRICAL ROLLERS
9. OUTER RING



Shoulder cylindrical roller bearings have the following technical characteristics:

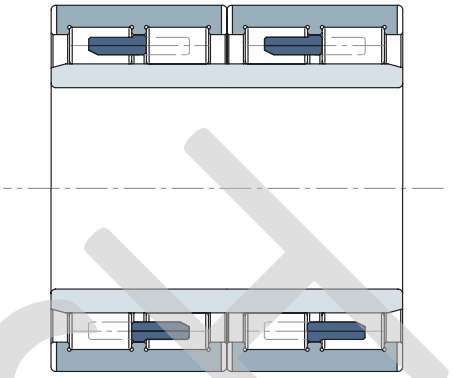
- Outer and inner rings are mainly supplied in UNI 100Cr6/100CrMo7 core hardened steel; some series can be supplied with outer rings in case hardened UNI 18NiCrMo5 steel, with 60±2 HRC hardness degree.
- Lateral thrust rings and distance rings are made in UNI 100Cr6/100CrMo7 steel too. The cages are made in bronze and have high thickness which guarantees resistance against high pressures.
- Shoulder bearings are manufactured with higher rotation precision than class P4 and with reduced tolerances as far as the height between the inner diameter and the outer diameter is concerned. They are classified in three groups, in which the difference between the heights is 5μ, or in 5 groups in which the difference is 2μ. The point of maximum thickness of the rings is indicated with an arrow stamped on their surface, where the group of height “H” is marked.
- Shoulder bearings are usually oil lubricated and have different lubrication holes on the inner ring.
- In some series, some elastic no-shearing layered seals are foreseen.

MULTIROLL BEARINGS

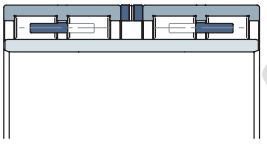
Four-row cylindrical roller bearings are generally used on the neck of milling cylinders, of calenders and of rolling presses. They are particularly suitable on high speed steel mills.

Thanks to the high quantity of rolling raceways, the radial load capacity is extremely high. Four-row cylindrical roller bearings are dismountable, that is to say, the outer ring and the cages form a unique body named “R” and can be fixed independently from the inner ring, named “L”. This makes the assembling and the maintenance of milling plant easier. This series of bearings is available with different executions, according to specifications, application conditions and maintenance.

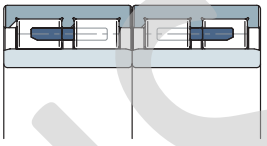
They differ from each other in the shape and in the number of parts that build the whole.



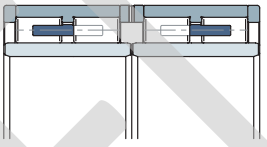
Execution ECR1
Two outer rings, each with three entire borders. One inner ring. Two massive side-to-side bronze cages, guided on rolls. With or without grooves and lubrication holes on the outer ring.



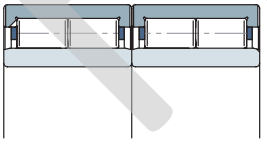
Execution ECR 2
As ECR1, but with an intermediate distance ring between the outer rings.



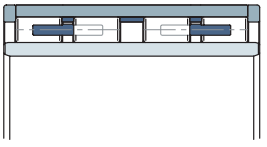
Execution ECR 3
Two outer rings, each with three central entire borders. Two inner rings. Two massive side-to-side bronze cages, guided on rolls. With or without grooves and lubrication holes on the outer ring.



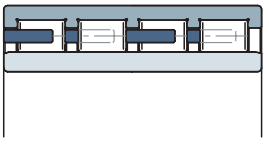
Execution ECR 4
Two outer rings, each with one central entire border and one inserted border; one intermediate distance ring. Two inner rings. Two massive side-to-side bronze cages, guided on rolls. With or without grooves and lubrication holes on the outer ring.



Execution ECR 5
Two outer rings, each with two entire borders. Two inner rings. Two massive bronze cages with millings, for both rows of rollers.



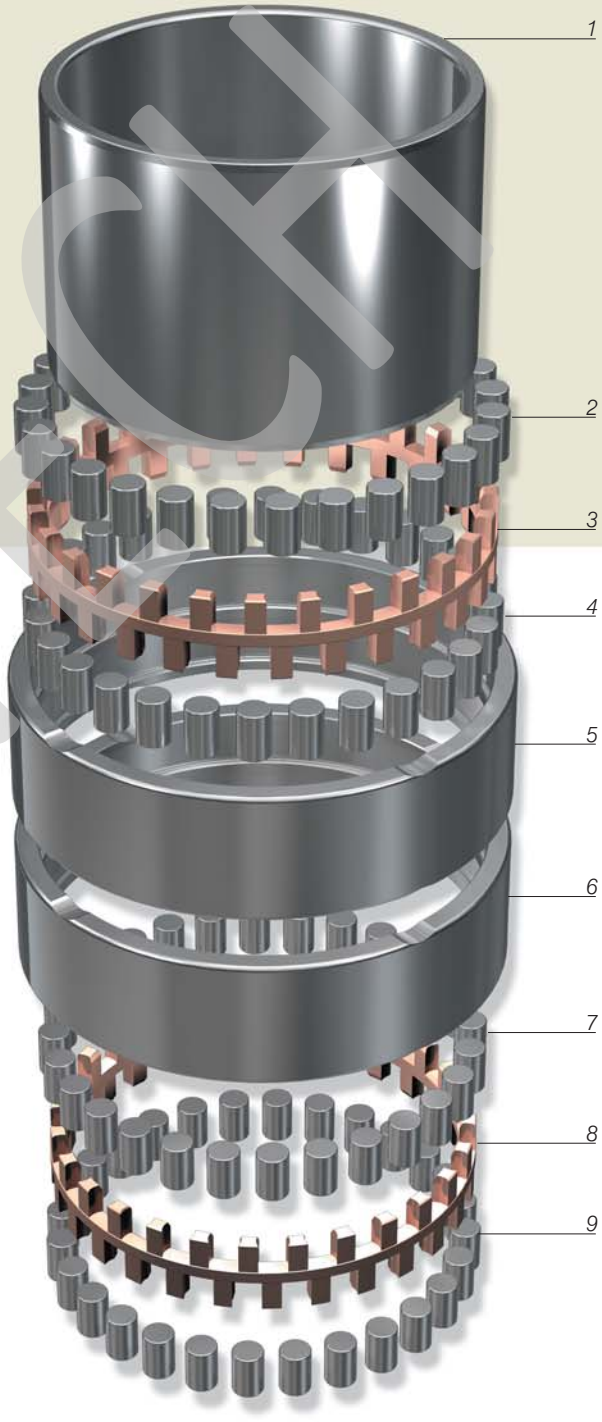
Execution ECR 6
One outer ring with three guide inserted rings and two inserted borders. One inner ring. Two massive side-to-side bronze cages. With or without grooves and lubrication holes on the outer ring.



Execution ECR 7
One outer ring with five inserted borders. One inner ring. Four massive rack-tooth bronze cages, guided on rolls. With or without grooves and lubrication holes on the outer ring.

MULTIROLL BEARINGS

1.	*INNER RING*
2.	*CYLINDRICAL ROLLERS*
3.	*CAGE*
4.	*CYLINDRICAL ROLLERS*
5.	*OUTER RING*
6.	*OUTER RING*
7.	*CYLINDRICAL ROLLERS*
8.	*CAGE*
9.	*CYLINDRICAL ROLLERS*

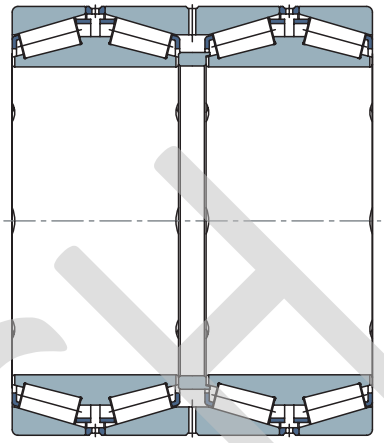


Multiroll cylindrical roller bearings have the following technical features:

- Outer and inner rings are mainly supplied in UNI 100Cr6/100CrMo7 core hardened steel and reach hardness 60-2 HRC.
- Also thrust rings and distance rings are manufactured in UNI 100Cr6 steel. Cages are supplied in bronze; sometimes, for some particular applications, they can be made in steel.
- Four-row cylindrical roller bearings are manufactured in P6/P5 precision class. Radial clearance is generally executed in C3 or C4.
- Multiroll bearings undergo stabilization treatment, which allows their use with temperatures up to 150° C, without any particular dimensional change. On request, stabilized bearings for working temperature up to 250° C can be supplied.

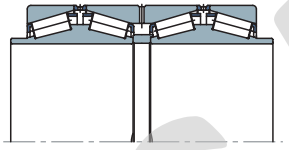
FOUR-ROW TAPERED
ROLLER BEARINGS

four-row tapered roller bearings are used on the neck of the cylinders, on steel mills in which the speed of milling is moderate. Their construction shape allows them to bear high axial loads, along with radial loads. Therefore they do not need lateral thrust bearings. The bearings of this series are manufactured with cylindrical hole and with tapered hole.
Four-row tapered roller bearings should be fixed as complete units in the correct housings, in order to allow a correct functioning and a quick replacement of the cylinders in case of maintenance.
Four-row tapered roller bearings are manufactured like the similar series with cylindrical rollers, with different executions, according to the specific needs of the working condition of the steel mill plant. They are manufactured both in metric and inch execution.
four-row tapered roller bearings are manufactured with normal tolerance class, the precision of rotation belongs to class P5. The bearings are supplied in complete units ready to be assembled.
The internal clearances are settled according to the application and in any case they are always marked with suffixes and numbers written on the drawings.
tapered roller bearings of this series undergo stabilization treatment, which allows them to be used up to 300° C without any dimensional modification.

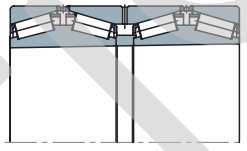


Execution ETO

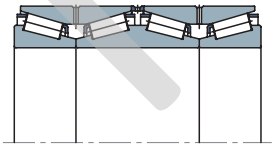
The bearings of this execution have two couples of rows with "X" shape. They have two double cones, one double cup and two single cups or four single cups.



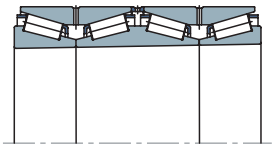
Execution ETOE
Like ETO execution, but with larger inner rings. Their extensions are grinded and act as ball raceways for the seals.



Execution ETOT
Like ETO execution, but with the tapered hole, taper 1:12.



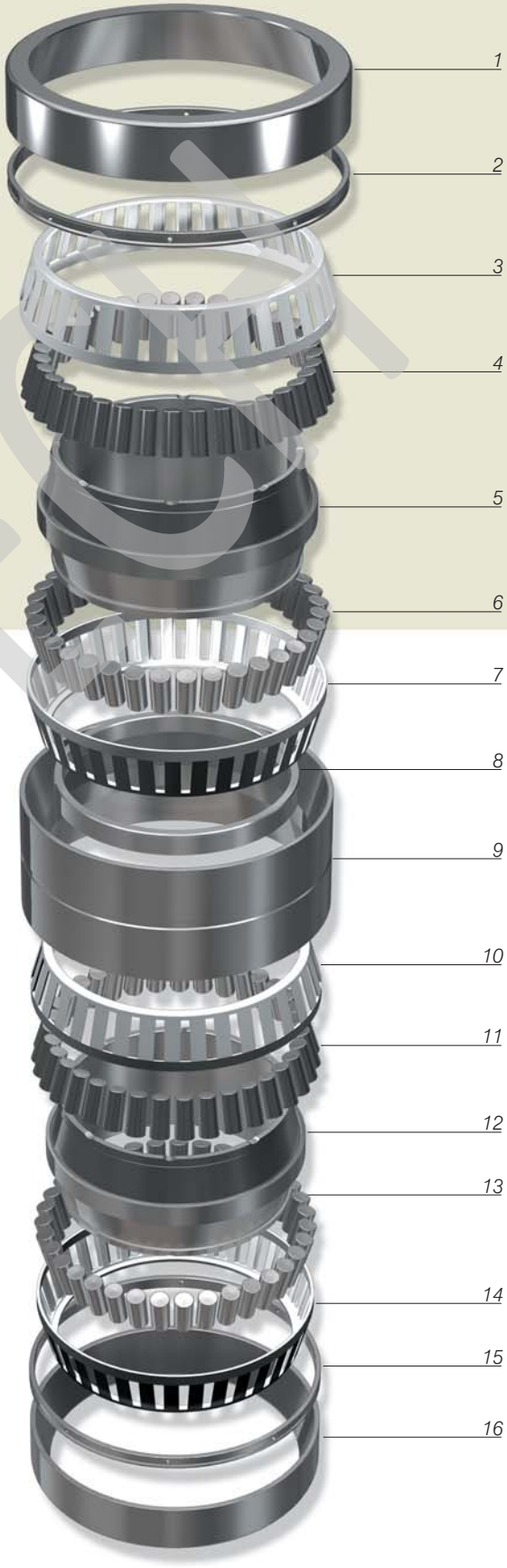
Execution ETI
The bearings of this execution have two couples of "O" rows. They are made of one double cone and of two single cones or two double cups or four single cups. These bearings usually have press-forged steel cages. ETI bearings are generally used when a high stiffness is needed and high tilting moments must be born. They are also used on the vertical cylinders of all-purpose steel mills.



Execution ETIT
Like ETI execution, but with taper hole, taper 1:12 or 1:30.

FOUR-ROW TAPERED
ROLLER BEARINGS

1.	*CONE*
2.	*DISTANCE RING*
3.	*CAGE*
4.	*TAPERED ROLLERS*
5.	*DOUBLE CUP*
6.	*TAPERED ROLLERS*
7.	*CAGE*
8.	*DISTANCE RING*
9.	*DOUBLE CONE*
10.	*CAGE*
11.	*TAPERED ROLLERS*
12.	*DOUBLE CUP*
13.	*TAPERED ROLLERS*
14.	*CAGE*
15.	*DISTANCE RING*
16.	*CONE*



- Cones and cups of four-row cylindrical roller bearings are manufactured in two types of steel according to the application:

  1 - Core hardened UNI 100Cr6 steel.
  2 - Case hardened UNI 18NiCrMo5 steel.

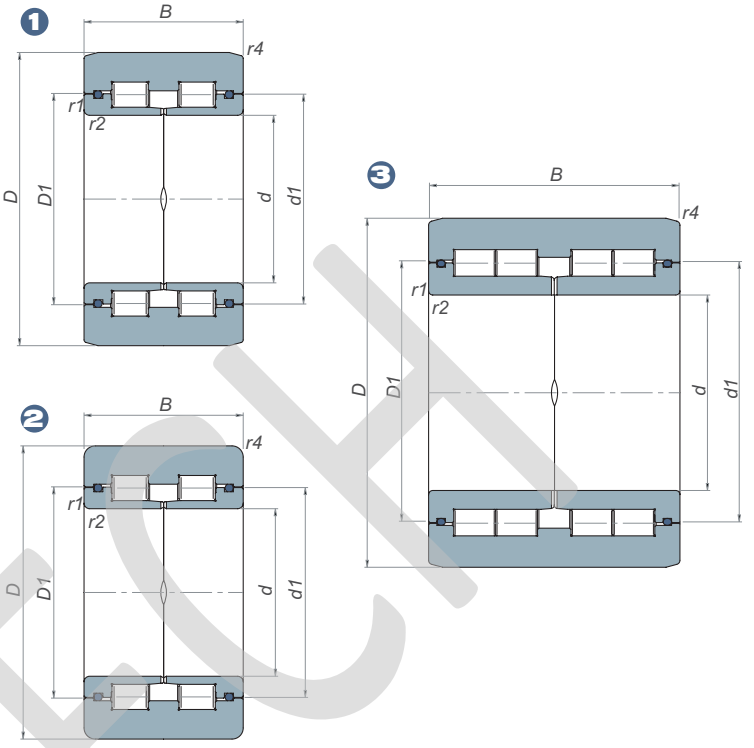
- In both cases, hardness reaches the degree of 60-2 HRC.
- The distance rings are manufactured in the same type of steel, whereas the cages are manufactured in press-forged steel.
- All the bearings are provided with holes and lubrication grooves on the outer part.

PRESSURE ROLLS

pressure rolls are mainly used in the continuous furnaces of sintering plants. They are massive bearings ready to be fixed.

They are used with heavy loads and where the rotation reverses continuously at low speed. The outer ring shows three entire borders, one section and one outer surface which is highly resistant to wear.

The inner ring is made of two parts, each one has an entire border expressly developed in order to bear high axial thrusts, in addition to radial loads.
Pressure rolls do not need maintenance.



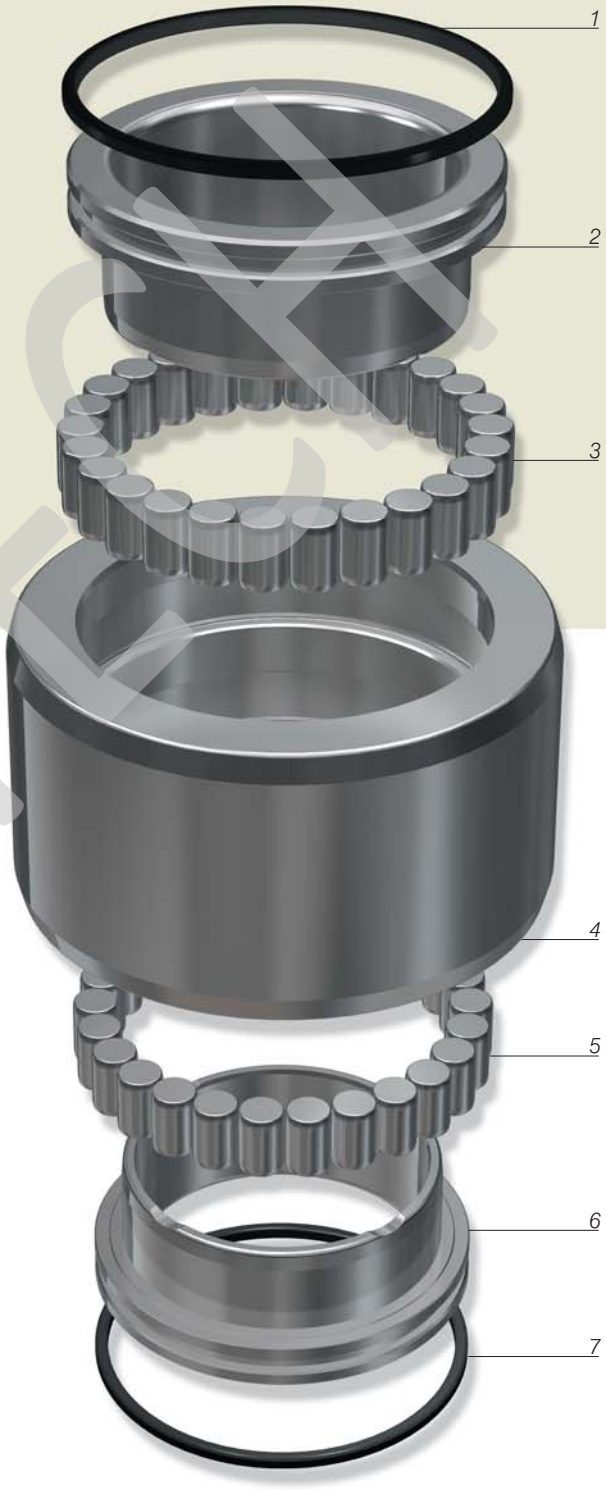
ref.	d	d_1	D	D_1	B	$r_{1,2\ min.}$	$r_{3,4\ min.}$	Execution	C	C_o	C_w	C_{ow}
	mm	mm	mm	mm	mm	mm	mm	type	KN	KN	KN	KN
900-2340	93	126	170	127	95	2	10x15°	1 TB2	429	655	286	390
900-3852	100	148	200	149	114	4	10X15°	1 TB2	605	1000	413	600
900-3853	105	151	215	153	87	3	3	2 TB1	501	695	358	450
900-2339	110	157	210	158	110	2	10X15°	1 TB2	402	610	255	325
900-2818	120	157	210	158	114	4	10X15°	1 TB2	550	915	330	455
900-3854	128,665	160	210	162	114	4	10X15°	1 TB2	583	1120	352	560
900-3855	140	178	250	180	110	3	11.5X17°	1	825	1400	561	850
900-3446	140	187	250	188	114	3	13.5X17°	1	825	1400	512	750
900-3856	140	187	280	188	114	3	13.5X15°	1 TB1	913	1460	671	1000
900-3857	160	195	250	197	140	3	13.5X17°	3 TB1	2120	4400	1100	1830
900-3858	160	231	320	233	120	4	13X17°	1	1140	2040	737	1140
900-3859	160	227	330	228	140	4	6.5X15°	1	1140	2040	825	1340
900-3860	180	238	330	240	125	4	6.5X15°	1	968	1930	644	1100

Bearing	C	Dynamic load	C_o	Static load
Roller	C_w	Dynamic load	C_{ow}	Static load

Notes:
TB1= bainitic temper of inner and outer ring
TB2= bainitic temper of outer ring

PRESSURE **ROLLS**

1. *VITON O-RING*
2. *INNER RING*
3. *CYLINDRICAL ROLLERS*
4. *OUTER RING*
5. *CYLINDRICAL ROLLERS*
6. *INNER RING*
7. *VITON O-RING*



pressure rolls have the following technical characteristics:

- The outer ring and the inner ring are manufactured in core-hardened UNI 100CrMo7 steel.
- This type of steel guarantees an excellent distribution of core-hardening.
- The degree of hardness is 60-2 HRC.
- In order to increase the resistance to wear – due to high load and contamination of outer agents – pressure rolls usually undergo bainitic temper treatment with the following suffixes: TB1 means bainitic temper of both rings, TB2 means bainitic temper only of the outer ring.
- Pressure rolls usually work at high temperatures, therefore they undergo stabilization treatment up to 250° C, named S2.
- The sealing system foresees the presence of Viton O-rings, which are inserted in the proper grooves on the inner ring. The seals allow the bearing to be disassembled, they prevent the entrance of contaminating agents and in the meantime, the leakage of lubricant.

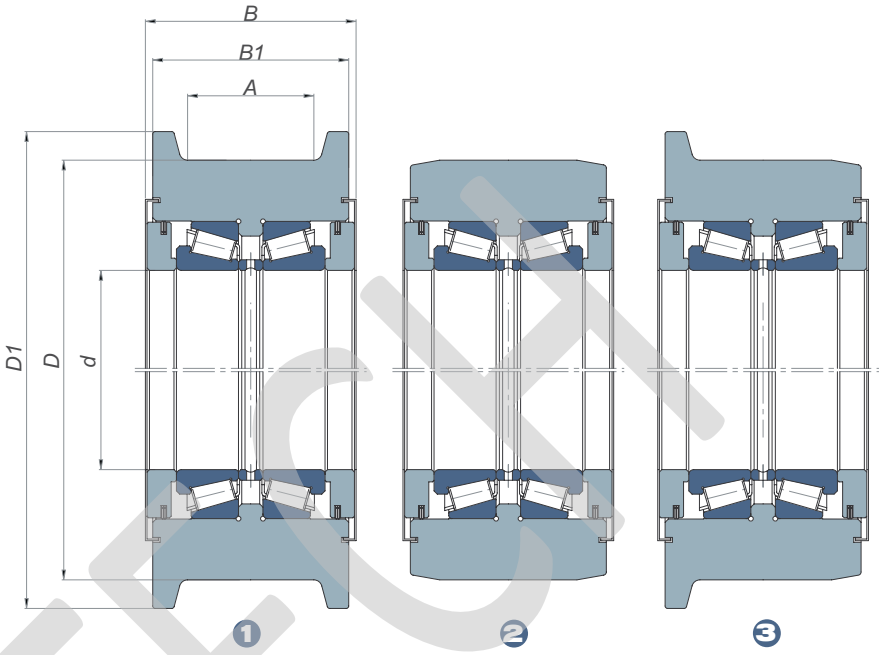
TAPERED **ROLLERS** FOR **CONVEYOR** BELTS

Series of rollers with different profiles of the outer ring have been developed for various applications in the field of steel industry.

They are mainly used as support bearings in conveyor belts for coils.

The execution with tapered rollers is particularly suitable in case of high radial loads and strong axial thrusts, which are due to the shape and the length of the belt. As the path of transportation is not linear, variations of directions of the applied load should be foreseen.

These tapered roller bearings are fixed in pre-loaded groups through an adjusted central distance ring.

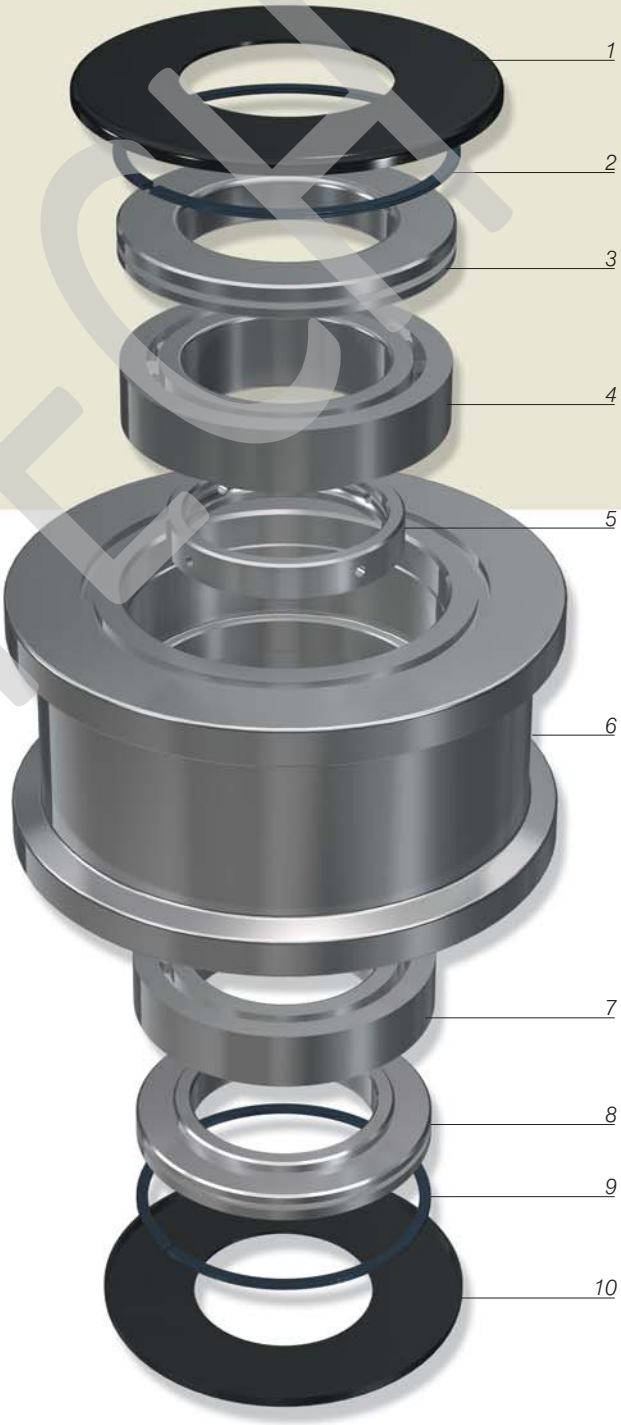


ref.	d	D	D_1	A	B_1	B	C	C_o	Max speed
	mm	mm	mm	mm	mm	mm	KN	KN	RPM min^{-1}
900-1946 / A	50	125	140	45	70	75	98	177	2.400
900-1946 / B	60	150	170	55	80	85	131	246	2.100
900-1946 / C	70	165	190	60	85	90	163	306	1.800
900-1946 / D	80	185	210	65	95	100	219	426	1.600
900-1946 / E	100	215	250	75	105	115	275	552	1.300
900-1946 / F	120	255	290	85	120	130	390	824	1.100

C Dynamic load C_o Static load

TAPERED **ROLLERS** FOR **CONVEYOR** BELTS

1.	*SEAL SHEET*
2.	*FEY SEAL RING*
3.	*SUPPORT THRUST RING*
4.	*TAPERED ROLLER BEARING*
5.	*DISTANCE RING*
6.	*OUTER RING*
7.	*TAPERED ROLLER BEARING*
8.	*SUPPORT THRUST RING*
9.	*FEY SEAL RING*
10.	*SEAL SHEET*



Tapered rollers for conveyor belts have the following characteristics:

- The outer ring is usually supplied in cementation steel UNI 16NiCr4 and reaches hardness degree of 60-2 HRC. The profile of the outer ring is available in three different executions:
  1) ring with double guide border on the outer surface,
  2) ring with outer surface without borders;
  3) ring with one guide border on the outer surface.
- The rollers have a double protection system, which is made of steel shields and steel elastic layered steel.
- Grease lubrication is made through a groove on the inner distance ring.

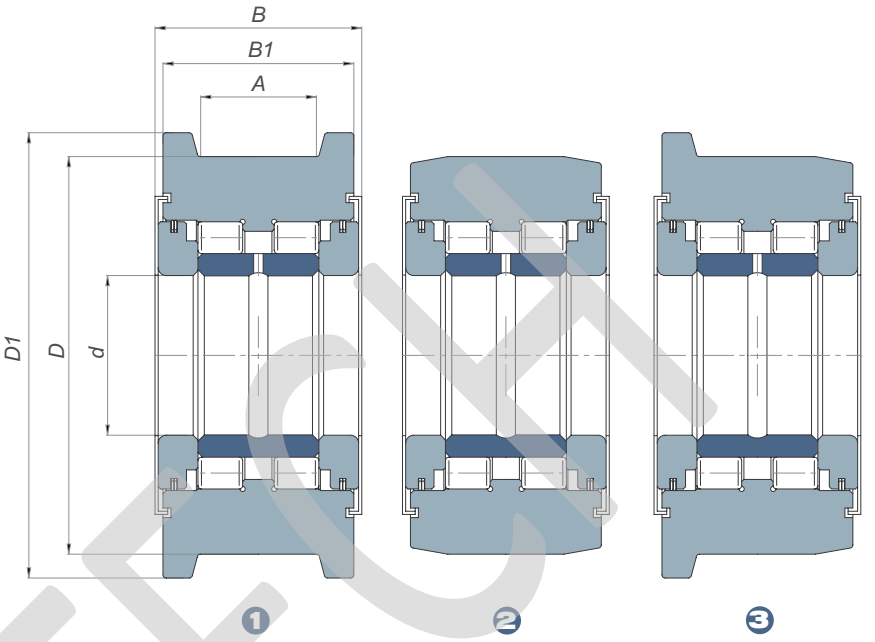
CYLINDRICAL **ROLLERS** FOR **CONVEYOR** BELTS

Full-complement cylindrical rollers for conveyor belts, like the previous series with tapered rollers, are manufactured with a different profile of the outer ring.

They are mainly used as support bearings in conveyor belts for coils. The execution with cylindrical rollers is generally used with high radial loads, as this can absorb distortions and dilatations.

In comparison with the execution with tapered rollers, this execution is used near high heat sources.

The entire borders obtained in the outer ring allow the absorption of average axial thrusts.

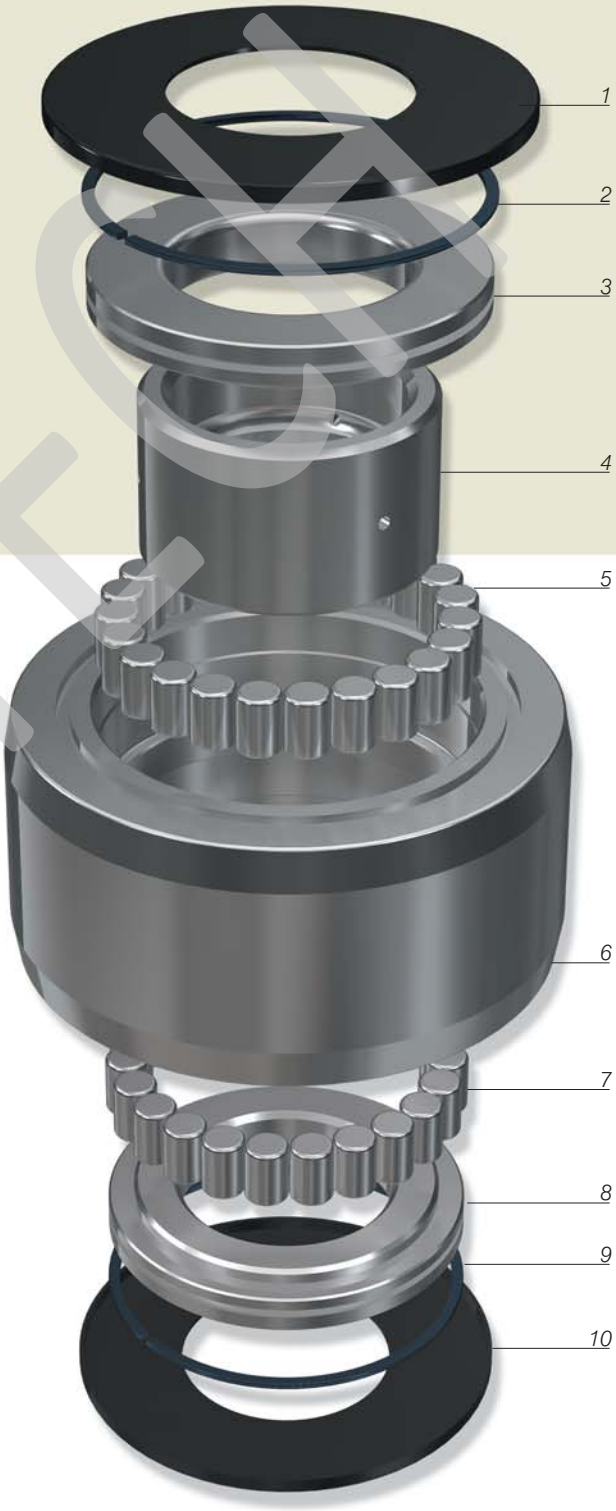


ref.	d	D	D_1	A	B_1	B	C	C_o	Max speed
	mm	mm	mm	mm	mm	mm	KN	KN	RPM min^{-1}
900-1947 / A	50	125	140	40	60	65	128	133	1.100
900-1947 / B	60	150	170	50	70	75	195	214	900
900-1947 / C	70	165	190	55	75	80	228	246	700
900-1947 / D	80	185	210	60	80	85	283	319	550
900-1947 / E	100	215	250	65	85	90	356	411	400
900-1947 / F	120	255	290	70	95	100	472	581	300

C Dynamic load C_o Static load

CYLINDRICAL **ROLLERS** FOR **CONVEYOR** BELTS

1.	SEAL SHEET
2.	FEY SEAL RING
3.	SUPPORT THRUST RING
4.	INNER RING
5.	CYLINDRICAL ROLLERS
6.	OUTER RING
7.	CYLINDRICAL ROLLERS
8.	SUPPORT THRUST RING
9.	FEY SEAL RING
10.	SEAL SHEET



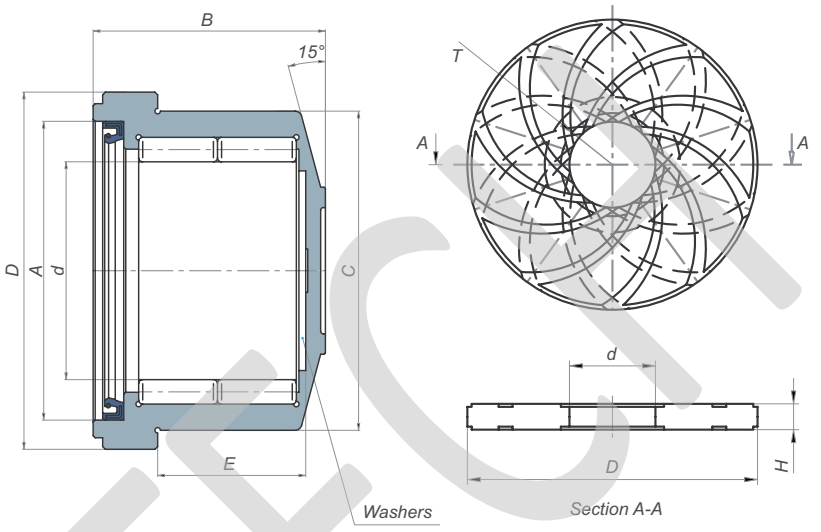
Full-complement cylindrical rollers have the following technical characteristics:

- The outer ring is usually manufactured in cementation UNI 16NiCr4 steel and reaches hardness degree of 60-2 HRC. The profile of the outer ring is available in three different executions: 1) ring with double guide border on the outer surface; 2) ring with outer surface without borders; 3) ring with one guide border on the outer surface.
- The inner ring is manufactured in case hardened UNI 100Cr6 steel with maximum hardness degree 60-2 HRC.
- Protection system has steel shields made with elastic layered steel rings.
- Grease lubrication is made through a groove on the inner distance ring.
- Considering the application of the cylindrical rollers, can supply execution with radial clearance C3/C4 and stabilizing heat treatment up to 250° C, on request.

CARDAN JOINT **BUSHINGS** AND **WASHERS**

Cardan joint bushings allow the coupling of two rotating shafts in order to transmit a stiff torque.

An adequate radial clearance prevents noise and vibrations during functioning.



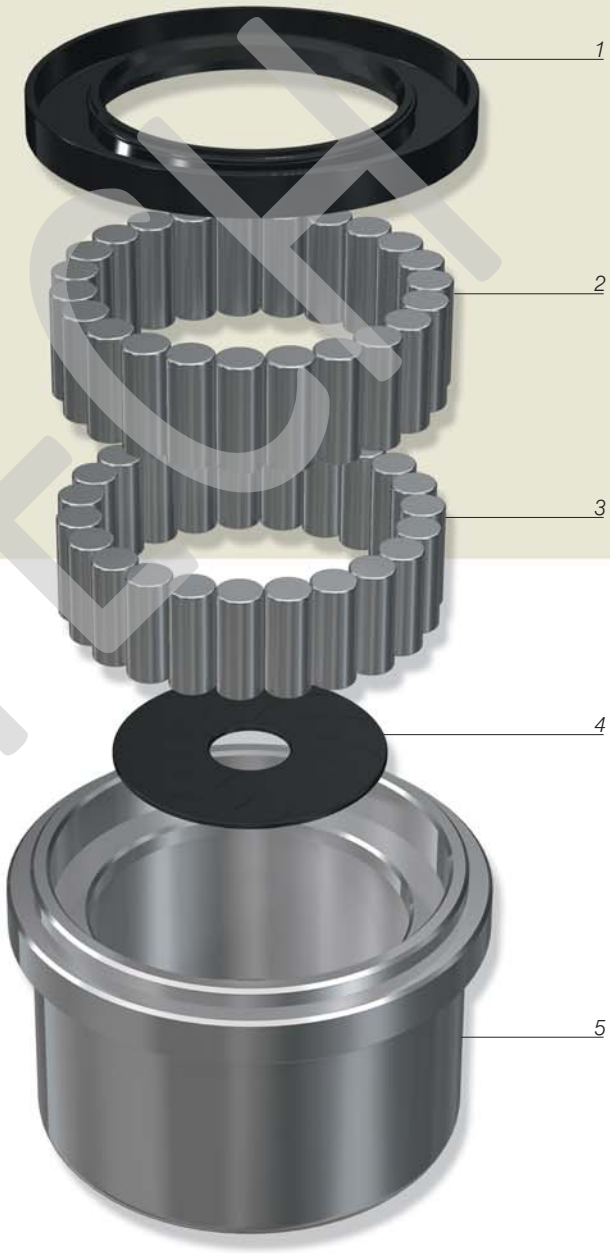
ref.	d	D	A	B	C	E	Washers
	mm	mm	mm	mm	mm	mm	
900-2061	45,85	84	70	60	74	39,5	8.0403
900-2062	51,5	92	80	70	83	45,5	8.0414
900-2059*	60,5	105	85	76,5	95	49,5	8.0402
900-2063	70	122	100	84,8	110	56	8.0406
900-2064	76,3	135	115	96,5	120	62	8.0404
900-2065	82,75	147	128	102,5	130	70,8	8.0405
900-2055	98,18	174	150	113,5	154	75,5	8.0409
900-2066	98,18	174	160	113,5	154	75,5	8.0409
900-2056	119,28	192	170	124	170	83,5	8.0410
900-2057	133,266	220	200	140	195	94	8.0411
900-2060	152,2	243	210	162,5	220	107	8.0413
900-2058	160,4	263	220	171	235	109	8.0412

** the chamfer is not 15° but 38°*

ref.	d	D	T	H
	mm	mm	mm	mm
800-0403	18	44,5	20	2,46 - 2,5 - 2,6 - 2,7 - 2,75 - 2,8 - 2,85
800-0414	18,5	49,5	20	2,96 - 3 - 3,04
800-0402	19,5	59	21	2,96 - 3 - 3,04
800-0406	20	67,5	24	2,9 - 3 - 3,1
800-0404	22	72	24	3,46 - 3,5 - 3,54
800-0405	27	82	30	3,46 - 3,5 - 3,54
800-0409	27	96	30	3,46 - 3,5 - 3,54
800-0410	27	105	30	3,96 - 4 - 4,04
800-0411	27	121	30	4,46 - 4,5 - 4,54
800-0413	27	138	30	4,96 - 5 - 5,04
800-0412	27	145	30	4,96 - 5 - 5,04

CARDAN JOINT **BUSHINGS** AND **WASHERS**

1. *SEAL "G" TYPE*
2. *CYLINDRICAL ROLLERS*
3. *CYLINDRICAL ROLLERS*
4. *WASHER IN DURETANO*
5. *BUSHING*



- cardan joint bushings are manufactured in UNI 100Cr6/100CrMo7 core hardened steel and reach hardness 60-2 HRC.
- A threaded hole for greaser UNI 7663 can be executed on the bottom on request.
- Washers in Duretano with different dimensions can be supplied along with the bushings.