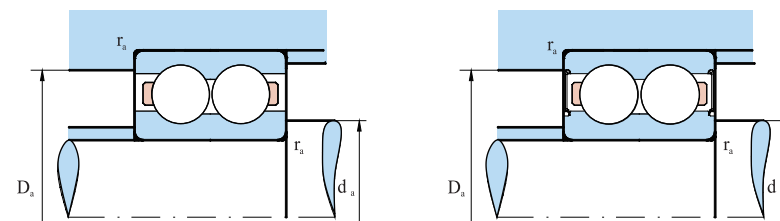
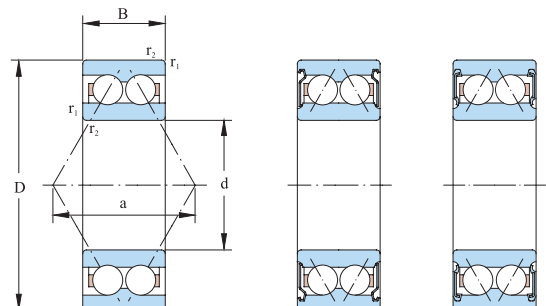


Double row angular contact ball bearings

With shield(s) or seal(s)

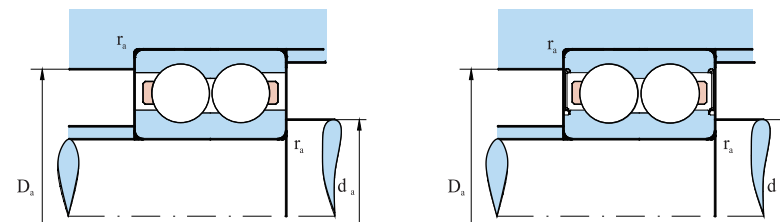
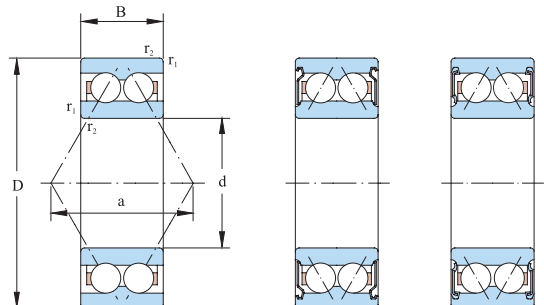


Designations					Boundary dimensions				Basic load ratings	
					d	D	B	$r_{1,2} \text{ min}$	Cr	Cor
Basic design	Z	2Z	RS	2RS	mm				kN	
3200ATN	ZTN	2ZTN	RSTN	2RSTN	10	30	14.3	0.6	7.59	4.4
3201ATN	ZTN	2ZTN	RSTN	2RSTN	12	32	15.9	0.6	10.3	5.63
3202ATN	ZTN	2ZTN	RSTN	2RSTN	15	35	15.9	0.6	11.3	6.85
3302ATN	ZTN	2ZTN	RSTN	2RSTN		42	19	1	14.2	8.8
3203ATN	ZTN	2ZTN	RSTN	2RSTN	17	40	17.5	0.6	14.2	8.8
3303ATN	ZTN	2ZTN	RSTN	2RSTN		47	22.2	1	20.5	12.1
3204ATN	ZTN	2ZTN	RSTN	2RSTN	20	47	20.6	1	19.1	12.2
3304ATN	ZTN	2ZTN	RSTN	2RSTN		52	22.2	1.1	22.6	14.7
3205ATN	ZTN	2ZTN	RSTN	2RSTN	25	52	20.6	1	20.1	14.3
3305ATN	ZTN	2ZTN	RSTN	2RSTN		62	25.4	1.1	28.9	19.4
3206ATN	ZTN	2ZTN	RSTN	2RSTN	30	62	23.8	1	28.6	20.5
3306ATN	ZTN	2ZTN	RSTN	2RSTN		72	30.2	1.1	39.5	27.5
3207ATN	ZTN	2ZTN	RSTN	2RSTN	35	72	27	1.1	35.4	26.2
3307ATN	ZTN	2ZTN	RSTN	2RSTN		80	34.9	1.5	49.5	35.3
3208ATN	ZTN	2ZTN	RSTN	2RSTN	40	80	30.2	1.1	40.3	32
3308ATN	ZTN	2ZTN	RSTN	2RSTN		90	36.5	1.5	60.5	41.2
3209ATN	ZTN	2ZTN	RSTN	2RSTN	45	85	30.2	1.1	42.8	34.7
3309ATN	ZTN	2ZTN	RSTN	2RSTN		100	39.7	1.5	72.4	54
3210ATN	ZTN	2ZTN	RSTN	2RSTN	50	90	30.2	1.1	45.1	38.8
3310ATN	ZTN	2ZTN	RSTN	2RSTN		110	44.4	2	85.3	64.8
3211ATN	ZTN	2ZTN	RSTN	2RSTN	55	100	33.3	1.5	53.8	47.3
3311ATN	ZTN	2ZTN	RSTN	2RSTN		120	49.2	2	106	82.3
3212ATN	ZTN	2ZTN	RSTN	2RSTN	60	110	36.5	1.5	60.1	53.6
3312ATN	ZTN	2ZTN	RSTN	2RSTN		130	54	2.1	122	95.2
3213ATN	ZTN	2ZTN	RSTN	2RSTN	65	120	38.1	1.5	73.5	66.6
3313ATN	ZTN	2ZTN	RSTN	2RSTN		140	58.7	2.1	138	110
3214ATN	ZTN	2ZTN	RSTN	2RSTN	70	125	39.7	1.5	80.5	73.8
3314ATN	ZTN	2ZTN	RSTN	2RSTN		150	63.5	2.1	155	125
3215ATN	ZTN	2ZTN	RSTN	2RSTN	75	130	41.3	1.5	91.5	77.7
3315M	Z	2Z	RS	2RS		160	68.3	2.1	163	166
3216ATN	Z	2Z	RS	2RS	80	140	44.4	2	98	81.5
3316M	Z	2Z	RS	2RS		170	68.3	2.1	176	186

Limiting speeds		Acting range a	Abutment and fillet dimensions			Mass
Grease	Oil		$d_a \text{ min}$	$D_a \text{ max}$	$r_a \text{ max}$	
r/min		mm	mm			kg
16000	22000	15	15	25	0.6	0.051
15000	20000	17	17	27	0.6	0.061
12000	17000	18	20	30	0.6	0.066
10000	15000	22	21	36	1	0.131
10000	15000	20	22	35	0.6	0.097
9500	14000	24	23	41	1	0.177
9000	13000	24	26	41	1	0.152
8500	12000	26	27	45	1	0.217
8000	11000	27	31	46	1	0.197
7500	10000	31	32	55	1	0.349
7000	9500	31	36	56	1	0.292
6300	8500	36	37	65	1	0.556
6000	8000	36	42	65	1	0.448
5600	7500	42	44	71	1.5	0.748
5600	7000	41	47	73	1	0.612
5000	6700	46	49	81	1.5	1.01
5000	6700	43	52	78	1	0.655
4500	6000	50	54	91	1.5	1.36
4800	6300	45	57	83	1	0.706
4000	5300	55	60	100	2	1.81
4300	5600	50	64	91	1.5	0.981
3800	5000	61	65	110	2	2.31
3800	5000	55	69	101	1.5	1.34
3400	4500	67	72	118	2	3.3
3400	4500	60	74	111	1.5	1.65
3200	4300	71	77	128	2	3.71
3400	4500	62	79	116	1.5	1.79
3000	4000	109	82	138	2	4.52
3200	4300	65	84	121	1.5	1.89
2800	3800	117	87	148	2	5.91
3000	4000	69	90	130	2	2.21
2600	3600	123	92	158	2	6.74

Double row angular contact ball bearings

With shield(s) or seal(s)



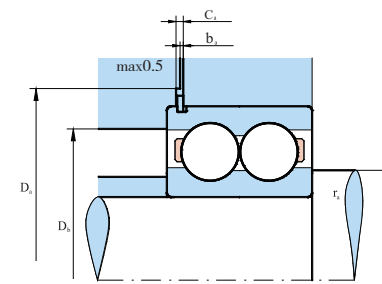
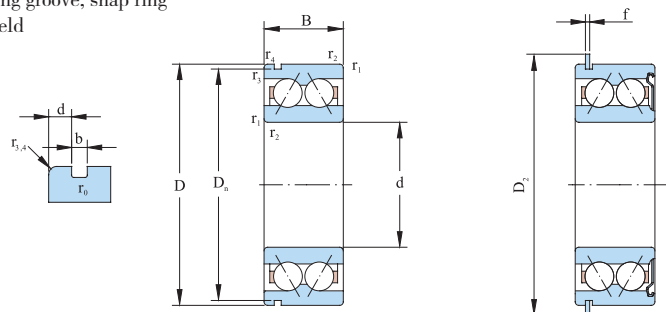
Designations					Boundary dimensions				Basic load ratings	
					d	D	B	$r_{1,2} \text{ min}$	Cr	Cor
Basic design	Z	2Z	RS	2RS	mm				kN	
3217M	Z	2Z	RS	2RS	85	150	49.2	2	112	132
3317M	Z	2Z	RS	2RS		180	73	3	190	200
3218M	Z	2Z	RS	2RS	90	160	52.4	2	125	146
3318M	Z	2Z	RS	2RS		190	73	3	216	240
3219M	Z	2Z	RS	2RS	95	170	55.6	2.1	140	163
3319M	Z	2Z	RS	2RS		200	77.8	3	220	245
3220M	Z	2Z	RS	2RS	100	180	60.3	2.1	160	196
3320M	Z	2Z	RS	2RS		215	82.6	3	240	280
3221M	Z	2Z	RS	2RS	105	190	65.1	2.1	176	208
3222M	Z	2Z	RS	2RS	110	200	69.8	2.1	190	228
3322M	Z	2Z	RS	2RS		240	92.1	3	280	345

Limiting speeds		Acting range a	Abutment and fillet dimensions			Mass
Grease	Oil		$d_a \text{ min}$	$D_a \text{ max}$	$r_a \text{ max}$	
r/min		mm	mm			kg
2800	3800	106	95	140	2	3.28
2400	3400	131	99	166	2	8.42
2600	3600	113	100	150	2	4.05
2200	3200	136	104	176	2.5	9.07
2400	3400	120	107	158	2	5.12
2200	3200	143	109	186	2.5	11.1
2200	3200	127	112	168	2	5.9
2000	3000	153	114	201	2.5	13.9
2200	3200	135	117	178	2	7.51
2000	3000	144	122	188	2	9.05
1800	2600	171	124	226	2.5	19.6



Double row angular contact ball bearings

with snap ring groove, snap ring
and one shield

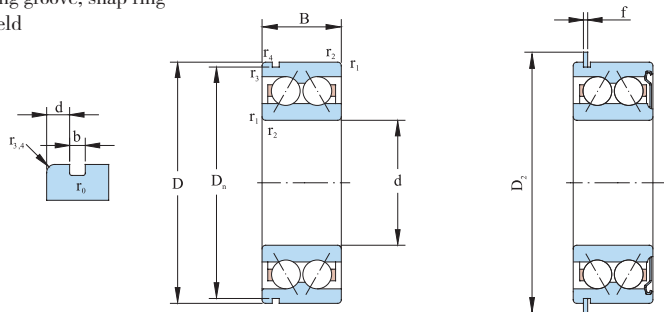


Designations				Boundary dimensions					Basic load ratings		Limiting speeds	
				d	D	B	r _{1, 2} min	r _{3, 4} min	Cr	Cor	Grease	Oil
N	NR	ZN	ZNRTN	mm					kN		r/min	
3200ANTN	NRTN	ZNTN	ZNRTN	10	30	14.3	0.6	0.5	7.59	4.4	16000	22000
3201ANTN	NRTN	ZNTN	ZNRTN	12	32	15.9	0.6	0.5	10.3	5.63	15000	20000
3202ANTN	NRTN	ZNTN	ZNRTN	15	35	15.9	0.6	0.5	11.3	6.85	12000	17000
3302ANTN	NRTN	ZNTN	ZNRTN		42	19	1	0.5	14.2	8.8	10000	15000
3203ANTN	NRTN	ZNTN	ZNRTN	17	40	17.5	0.6	0.5	14.2	8.8	10000	15000
3303ANTN	NRTN	ZNTN	ZNRTN		47	22.2	1	0.5	20.5	12.1	9500	14000
3204ANTN	NRTN	ZNTN	ZNRTN	20	47	20.6	1	0.5	19.1	12.2	9000	13000
3304ANTN	NRTN	ZNTN	ZNRTN		52	22.2	1.1	0.5	22.6	14.7	8500	12000
3205ANTN	NRTN	ZNTN	ZNRTN	25	52	20.6	1	0.5	20.1	14.3	8000	11000
3305ANTN	NRTN	ZNTN	ZNRTN		62	25.4	1.1	0.5	28.9	19.4	7500	10000
3206ANTN	NRTN	ZNTN	ZNRTN	30	62	23.8	1	0.5	28.6	20.5	7000	9500
3306ANTN	NRTN	ZNTN	ZNRTN		72	30.2	1.1	0.5	39.5	27.5	6300	8500
3207ANTN	NRTN	ZNTN	ZNRTN	35	72	27	1.1	0.5	35.4	26.2	6000	8000
3307ANTN	NRTN	ZNTN	ZNRTN		80	34.9	1.5	0.5	49.5	35.3	5600	7500
3208ANTN	NRTN	ZNTN	ZNRTN	40	80	30.2	1.1	0.5	40.3	32	5600	7000
3308ANTN	NRTN	ZNTN	ZNRTN		90	36.5	1.5	0.5	60.5	41.2	5000	6700
3209ANTN	NRTN	ZNTN	ZNRTN	45	85	30.2	1.1	0.5	42.8	34.7	5000	6700
3309ANTN	NRTN	ZNTN	ZNRTN		100	39.7	1.5	0.5	72.4	54	4500	6000
3210ANTN	NRTN	ZNTN	ZNRTN	50	90	30.2	1.1	0.5	45.1	38.8	4800	6300
3310ANTN	NRTN	ZNTN	ZNRTN		110	44.4	2	0.5	85.3	64.8	4000	5300
3211ANTN	NRTN	ZNTN	ZNRTN	55	100	33.3	1.5	0.5	53.8	47.3	4300	5600
3311ANTN	NRTN	ZNTN	ZNRTN		120	49.2	2	0.5	106	82.3	3800	5000
3212ANTN	NRTN	-ZNTN	-ZNRTN	60	110	36.5	1.5	0.5	60.1	53.6	3800	5000
3312ANTN	NRTN	-ZNTN	-ZNRTN		130	54	2.1	0.5	122	95.2	3400	4500
3213ANTN	NRTN	-ZNTN	-ZNRTN	65	120	38.1	1.5	0.5	73.5	66.6	3400	4500
3313ANTN	NRTN	-ZNTN	-ZNRTN		140	58.7	2.1	0.5	138	110	3200	4300
3214ANTN	NRTN	-ZNTN	-ZNRTN	70	125	39.7	1.5	0.5	80.5	73.8	3400	4500
3314ANTN	NRTN	-ZNTN	-ZNRTN		150	63.5	2.1	0.5	155	125	3000	4000
3215ANTN	NRTN	-ZNTN	-ZNRTN	75	130	41.3	1.5	0.5	91.5	77.7	3200	4300
3315MN	NR	-ZN	-ZNR		160	68.3	2.1	0.5	163	166	2800	3800
3216ANTN	NRTN	-ZNTN	-ZNRTN	80	140	44.4	2	0.5	98	81.5	3000	4000
3316MN	NR	-ZN	-ZNR		170	68.3	2.1	0.5	176	186	2600	3600

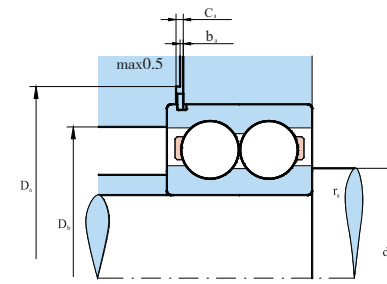
Snap ring			Snap ring groove dimensions				Abutment and fillet dimensions						Mass
Code	D ₂ max	f	D _n max	b min	d max	r ₀ max	d _a min	D _a max	D _b min	b _a min	C _a max	r _a max	
	mm		mm				mm						kg
NR30	34.7	1.12	28.17	1.35	2.06	0.4	14	26	36	1.5	3.18	0.6	0.046
NR32	36.7	1.12	30.15	1.35	2.06	0.4	16	28	38	1.5	3.18	0.6	0.055
NR35	39.7	1.12	33.17	1.35	2.06	0.4	19	31	41	1.5	3.18	0.6	0.06
NR42	46.3	1.12	39.75	1.35	2.46	0.4	20	37	47	1.5	3.18	1	0.124
NR40	44.6	1.12	38.1	1.35	2.06	0.4	21	36	46	1.5	3.18	0.6	0.09
NR47	52.7	1.12	44.6	1.35	2.46	0.4	22	42	54	1.5	3.58	1	0.165
NR47	52.7	1.12	44.6	1.35	2.46	0.4	25	42	54	1.5	3.58	1	0.142
NR52	57.9	1.12	49.73	1.35	2.46	0.4	26.5	45.5	59	1.5	3.58	1	0.203
NR52	57.9	1.12	49.73	1.35	2.46	0.4	30	47	59	1.5	3.58	1	0.185
NR62	67.7	1.7	59.61	1.9	3.28	0.6	31.5	55.5	69	2.2	4.98	1	0.333
NR62	67.7	1.7	59.61	1.9	3.28	0.6	35	57	69	2.2	4.98	1	0.279
NR72	78.6	1.7	68.81	1.9	3.28	0.6	36.5	65.5	80	2.2	4.98	1	0.54
NR72	78.6	1.7	68.81	1.9	3.28	0.6	41.5	65.5	80	2.2	4.98	1	0.435
NR80	86.6	1.7	76.81	1.9	3.28	0.6	43	72	88	2.2	4.98	1.5	0.733
NR80	86.6	1.7	76.81	1.9	3.28	0.6	46.5	73.5	88	2.2	4.98	1	0.6
NR90	96.5	2.46	86.79	2.7	3.28	0.6	48	82	98	3	5.74	1.5	0.985
NR85	91.6	1.7	81.81	1.9	3.28	0.6	51.5	78.5	93	2.2	4.98	1	0.641
NR100	106.5	2.46	96.8	2.7	3.28	0.6	53	92	108	3	5.74	1.5	1.34
NR90	96.5	2.46	86.79	2.7	3.28	0.6	56.5	83.5	98	3	5.74	1	0.682
NR110	116.6	2.46	106.8	2.7	3.28	0.6	59	101	118	3	5.74	2	1.79
NR100	106.5	2.46	96.8	2.7	3.28	0.6	63	92	108	3	5.74	1.5	0.967
NR120	129.7	2.82	115.21	3.1	4.06	0.6	64	111	131	3.5	6.88	2	2.29
NR110	116.6	2.46	106.81	2.7	3.28	0.6	68	102	118	3	5.74	1.5	1.32
NR130	139.7	2.82	105.22	3.1	4.06	0.6	71	119	141	3.5	6.88	2	3.28
NR120	129.7	2.82	115.21	3.1	4.06	0.6	73	112	131	3.5	6.88	1.5	1.63
NR140	149.7	2.82	135.23	3.1	4.9	0.6	76	129	151	3.5	7.72	2	3.69
NR125	134.7	2.82	120.22	3.1	4.06	0.6	78	117	136	3.5	6.88	1.5	1.77
NR150	159.7	2.82	145.24	3.1	4.9	0.6	81	139	162	3.5	7.72	2	4.49
NR130	139.7	2.82	125.22	3.1	4.06	0.6	83	122	141	3.5	6.88	1.5	1.87
NR160	169.7	2.82	155.22	3.1	4.9	0.6	86	149	172	3.5	7.72	2	5.88
NR140	149.7	2.82	135.23	3.1	4.9	0.6	89	131	151	3.5	7.72	2	2.19
NR170	182.9	3.1	163.65	3.5	5.69	0.6	91	159	185	3.5	8.79	2	6.71

Double row angular contact ball bearings

with snap ring groove, snap ring
and one shield



Designations				Boundary dimensions					Basic load ratings		Limiting speeds	
				d	D	B	r _{1, 2} min	r _{3, 4} min	Cr	Cor	Grease	Oil
N	NR	ZN	ZNR	mm					kN		r/min	
3217MN	NR	-ZN	-ZNR	85	150	49.2	2	0.5	112	132	2800	3800
3317MN	NR	-ZN	-ZNR		180	73	3	0.5	190	200	2400	3400
3218MN	NR	-ZN	-ZNR	90	160	52.4	2	0.5	125	146	2600	3600
3318MN	NR	-ZN	-ZNR		190	73	3	0.5	216	240	2200	3200
3219MN	NR	-ZN	-ZNR	95	170	55.6	2.1	0.5	140	163	2400	3400
3319MN	NR	-ZN	-ZNR		200	77.8	3	0.5	220	245	2200	3200
3220MN	NR	-ZN	-ZNR	100	180	60.3	2.1	0.5	160	196	2200	3200
3221MN	NR	-ZN	-ZNR	105	190	65.1	2.1	0.5	176	208	2200	3200
3222MN	NR	-ZN	-ZNR	110	200	69.8	2.1	0.5	190	228	2000	3000

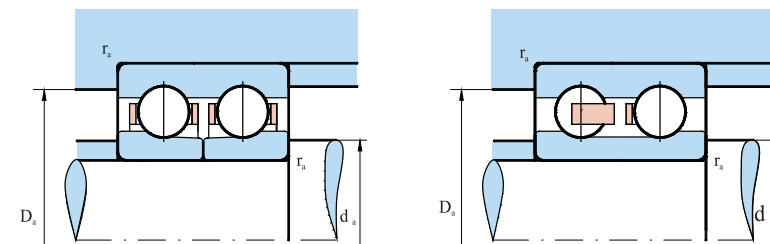
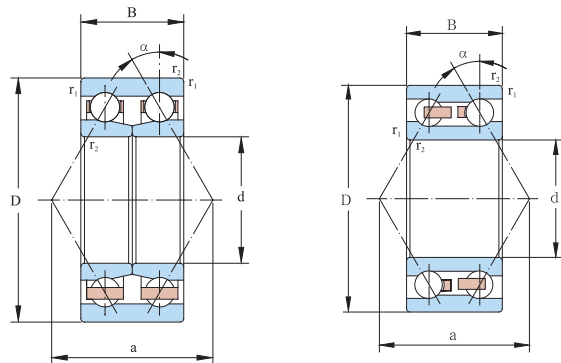


Snap ring			Snap ring groove dimensions				Abutment and fillet dimensions						Mass
Code	D ₂ max	f	D _n max	b min	d max	r ₀ max	d _a min	D _a max	D _b min	b _a min	C _a max	r _a max	
	mm		mm				mm						kg
NR150	159.7	2.82	145.24	3.1	4.9	0.6	94	141	162	3.5	7.72	2	3.25
NR180	192.9	3.1	173.66	3.5	5.69	0.6	98	167	195	4	8.79	2.5	8.38
NR160	169.7	2.82	155.22	3.1	4.9	0.6	99	151	172	3.5	7.72	2	4.02
NR190	202.9	3.1	183.64	3.5	5.69	0.6	103	177	205	4	8.79	2.5	9.04
NR170	182.9	3.1	163.65	3.5	5.69	0.6	106	159	185	4	8.79	2	5.1
NR200	212.9	3.1	193.65	3.5	5.69	0.6	108	187	215	4	8.79	2.5	11
NR180	192.9	3.1	173.66	3.5	5.69	0.6	110	169	195	4	8.79	2	5.86
NR190	202.9	3.1	183.64	3.5	5.69	0.6	117	178	205	4	8.79	2	7.48
NR200	212.9	3.1	193.65	3.5	5.69	0.6	122	188	215	4	8.79	2	9.01



Double row angular contact ball bearings

variants



Designations	Boundary dimensions				Basic load ratings	
	d	D	B	$r_{1, 2} \text{ min}$	Cr	Cor
	mm				kN	
3209M	45	85	30.2	1.1	39	46
3212M	60	110	36.5	1.5	63.5	81
3213YM	65	120	38.1	1.5	70	96
3313DYM		140	58.74	2.1	126	150
3215DYM	75	130	41.3	1.5	85	119
3215		130	41.3	1.5	82	115
3315DYM		160	68.3	2.1	160	197
3315	80	160	68.3	2.1	156	191
3316M		170	68.3	2.1	170	216
3220YM	100	180	60.3	2.1	152	215
3322M	110	240	92.1	3	275	429
4032DM	160	240	80	2.1	131	289
4936X3DM	180	260	66	2.1	216	313
4936X3DM/W34		260	66	2.1	216	313
4938X3DM	190	270	66	2.1	169	324
4938X3DM/W34		270	66	2.1	169	324
4040M/W34	200	310	109	2.1	264	538
4944X3DM	220	310	76	2.1	192	381
4044DM/W34		340	118	3	276	596
4048X1DM/W34	240	360	118	3	289	648
4952X3DM/W34	260	370	92	4	287	660
4956X3DM/W34-1	280	390	92	4	290	683
4960X3DM	300	420	112	2.1	325	791
4060DYM		460	160	4	438	1149

Limiting speeds		Acting range a	Abutment and fillet dimensions			Mass
Grease	Oil		$d_a \text{ min}$	$D_a \text{ max}$	$r_a \text{ max}$	
r/min		mm	mm			kg
5000	6700	53.7	52	78	1	0.719
3800	5000	70	69	101	1.5	1.47
3600	4500	64.9	74	111	1.5	1.84
3200	4300	79.7	77	128	2	4.89
3200	4300	70.9	84	121	1.5	2.81
3200	4300	82.6	84	121	1.5	2.09
3000	4100	91.8	87	148	2	6.82
3000	4100	104.5	87	148	2	6.27
2800	3600	106	92	158	2	7.21
2000	2700	130.2	112	168	2	6.46
1800	2400	152	124	226	2.5	19.9
1900	2500	240.8	172	228	2	12.2
1400	1800	253.8	192	248	2	10.8
1400	1800	253.8	192	248	2	10.7
1350	1700	263.6	202	258	2	11.5
1350	1700	263.6	202	258	2	11.5
1200	1600	310.7	212	298	2	2
1100	1500	301.9	232	298	2	2
1000	1400	340.2	234	326	2.5	2.5
900	1250	360.2	254	346	2.5	2.5
800	1200	360.2	278	352	3	3
750	1100	382.2	298	372	3	3
700	1000	417.3	342	408	2	2
640	960	400	348	442	3	3