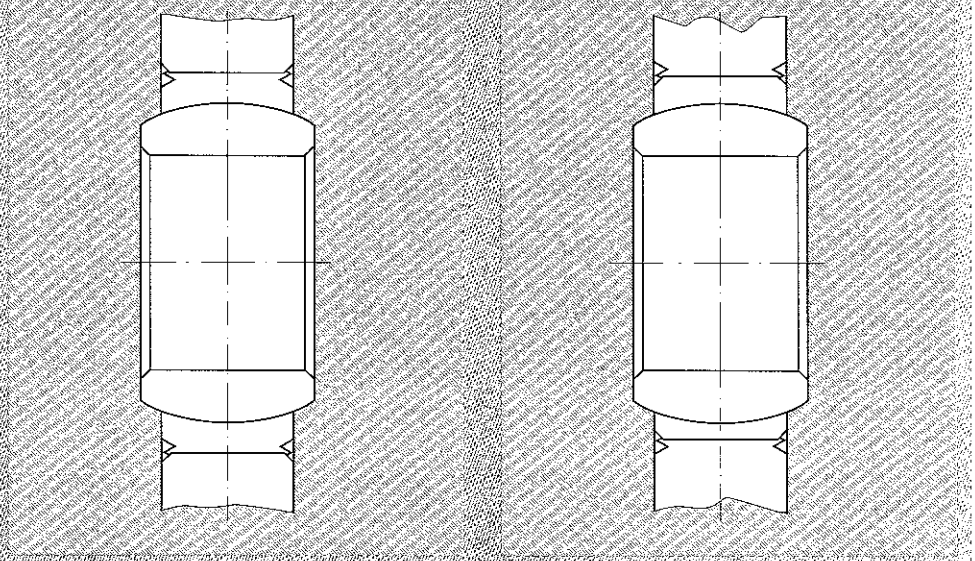
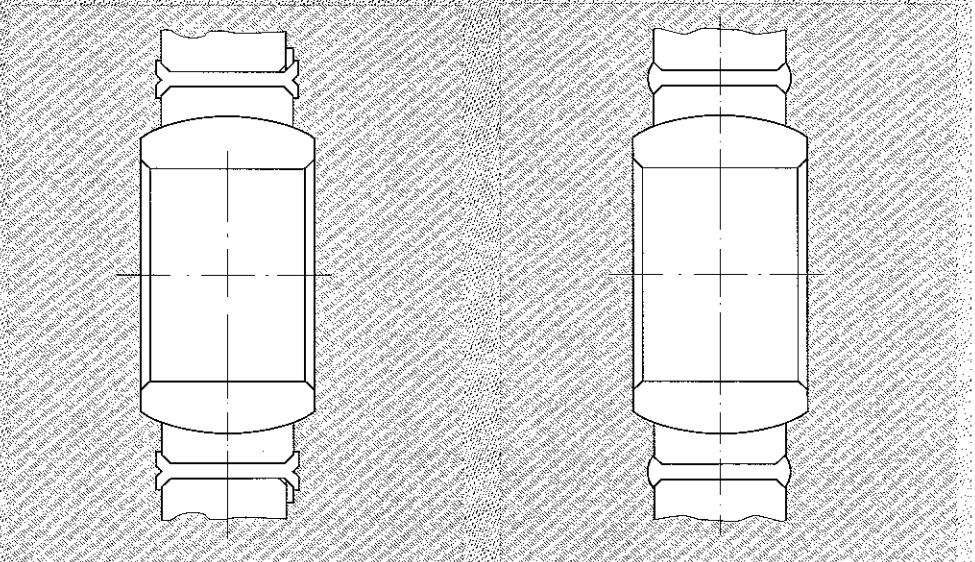
Details of an installation depend on many factors such as:

housing material, access for tools, accurancy of parts and need to replace bearings.

Four different variations are shown.





SPHERICAL BEARINGS

Slotted type, according to LN 9193.

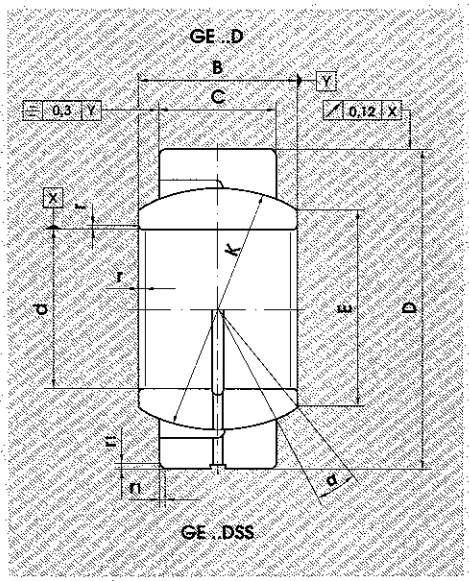
Series: **GE...D**
Series: **GE...DSS**
Lubrication grooves and holes

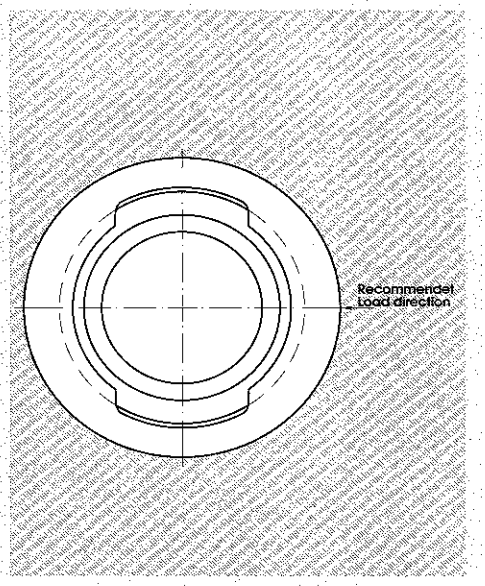
Material
Outer ring: EN 2031 (1.3505.3 or 1.3505.7) hardened and tempered to HRc 55 to 62
Inner ring: EN 2031 (1.3505.9)

Surface treatment and lubrication

Outer and inner rings: etched or 1002 LN 9368 Part 3
Sliding surfaces: 5902 LN 9368 Part 7
} without code

Outer and inner rings: etched or 1002 LN 9368 Part 3
Sliding surface of inner or outer ring: 5906 LN 9368 Part 7
} code T





Bearing Number		d	Δdmp µm	D	ΔDmp µm	B	ΔBmp µm	C	ΔCmp µm	E min.	K ≈	r	r_1	α	Out of round µm Δds	Out of round µm ΔDs
GE 4 D	-	4		12		5		3		6	8			16°		
GE 5 D	-	5		14	0	6	0	4		7	10	0,3		13°		+5
GE 6 D	-	6		14	-8	6	-75	4		8	10	to	0,3	13°	+2	-13
GE 8 D	-	8	0	16		8		5		10	13	0,6	to	15°	-10	
GE 10 D	-	10	-8	19		9	0	6		13	16		0,8	12°		
GE 12 D	-	12		22	0	10	-90	7		15	18			11°		+6
GE 15 D	GE 15 DSS	15		26	-9	12		9		18	22	0,5	0,5	9°	+3	-15
GE 17 D	GE 17 DSS	17		30		14	0	10		20	25	to	to	10°	-11	
GE 20 D	GE 20 DSS	20		35		16	-110	12	0	24	29	0,8	1,2	9°		
GE 25 D	GE 25 DSS	25	0	42	0	20		16	-240	29	36		0,6	7°	+3	+8
GE 30 D	GE 30 DSS	30	-10	47	-11	22	0	18		34	41		to	6°	-13	-19
GE 35 D	GE 35 DSS	35		55		25	-130	20		39	47		1,5	7°		
GE 40 D	GE 40 DSS	40	0	62	0	28		22		45	53	0,6	0,8	7°	+3	
GE 45 D	GE 45 DSS	45	-12	68	-13	32		25		50	60	to	to	7°	-15	+10
GE 50 D	GE 50 DSS	50		75		35	0	28		55	66	1,0	1,7	7°		-23
GE 60 D	GE 60 DSS	60	0	90	0	44	-160	36		66	80	0,8	1,0	6°	+4	+13
GE 70 D	GE 70 DSS	70	-15	105	-15	49		40		77	92	to	to	6°	-19	-28
GE 80 D	GE 80 DSS	80		120		55	0-190	45		88	105	1,2	2,2	6°		

The load combined of the radial load F_r and the axial load F_a shall be calculated as follows:

$F_r + 6\,F_a \leq C_0$, where $F_r > F_a$ in the direction opposite to the assembly slots.
$F_r + 12\,F_a \leq C_0$ in the direction of the assembly slots.

Under radial load the assembly slot shall remain at 90° to the load direction.

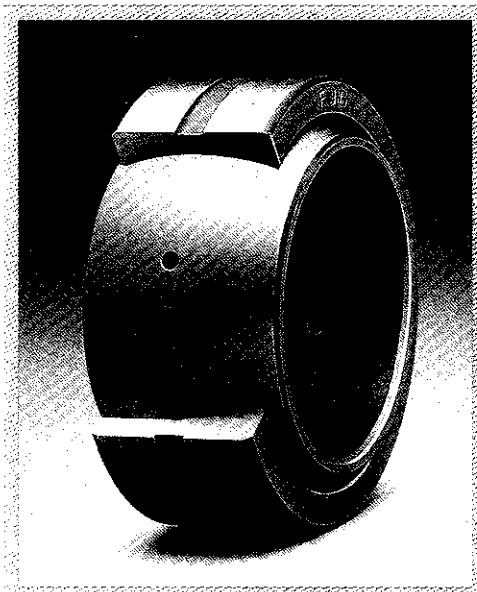
F_r = radial component of the applied load
F_a = axial component of the applied load
Where F_r has to be greater than F_a

Designation

Each bearing is designated as in the following example:

GE 17 D SS .1 T

- GE 17: Number of standard Dimensions
- D: with lubrication grooves and hole
- SS: Radial play
- .1: Code for dry lubrication
- T



Dimensions in millimetres

Radial play in µm		Static Radial Limit Load Rating C_0 in kN	Mass g	Bearing Number	
.1	.2				
		12	3	GE 4 D	-
		20	4	GE 5 D	-
1-8	8-16	20	4	GE 6 D	-
		32	8	GE 8 D	-
		48	12	GE 10 D	-
		63	17	GE 12 D	-
		99	32	GE 15 D	GE 15 D
1-10	10-20	125	49	GE 17 D	GE 17 D
		174	65	GE 20 D	GE 20 D
		284	115	GE 25 D	GE 25 D
1-12	12-25	366	160	GE 30 D	GE 30 D
		470	229	GE 35 D	GE 35 D
		583	315	GE 40 D	GE 40 D
1-15	15-30	750	460	GE 45 D	GE 45 D
		924	560	GE 50 D	GE 50 D
		1440	1100	GE 60 D	GE 60 D
1-18	18-36	1840	1540	GE 70 D	GE 70 D
		2362	2290	GE 80 D	GE 80 D

Procurement Specification DIN 65237

SPHERICAL BEARINGS

Slotted type, according to LN 9367.

Series: **GE...DN**
Series: **GE...DNSS**
Lubrication grooves and holes

Material
Outer ring: EN 2030 (1.3544.9)
Inner ring: EN 2030 (1.3544.3 or 1.3544.7), hardened and tempered to HRc 55 to 62

Surface treatment and lubrication

Outer and inner rings:
1201 LN 9368 Part 3

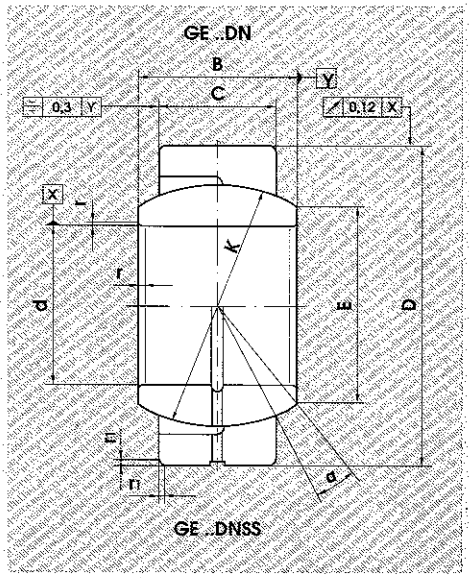
Sliding surfaces:
5902 LN 9368 Part 7

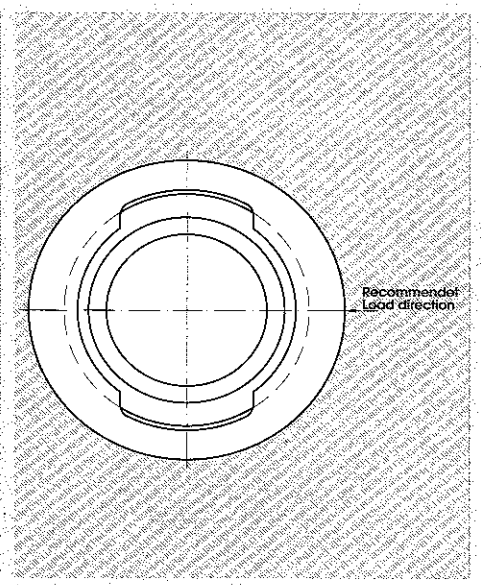
} without code

Outer and inner rings:
1201 LN 9368 Part 3

Sliding surface of inner or outer ring:
5906 LN 9368 Part 7

} code T





Bearing Number		d	Δdmp µm	D	ΔDmp µm	B	ΔBmp µm	C	ΔCmp µm	E min.	K ≈	r	r_1	α	Out of round µm Δds	Out of round µm ΔDs
GE 4 DN	-	4		12		5		3		6	8			16°		
GE 5 DN	-	5		14	0	6	0	4		7	10	0,3		13°		+5
GE 6 DN	-	6		14	-8	6	-75	4		8	10	to	0,3	13°	+2	-13
GE 8 DN	-	8	0	16		8		5		10	13	0,6	to	15°	-10	
GE 10 DN	-	10	-8	19		9	0	6		13	16		0,8	12°		
GE 12 DN	-	12		22	0	10	-90	7		15	18			11°		+6
GE 15 DN	GE 15 DNSS	15		26	-9	12		9		18	22	0,5	0,5	9°	+3	-15
GE 17 DN	GE 17 DNSS	17		30		14	0	10		20	25	to	to	10°	-11	
GE 20 DN	GE 20 DNSS	20		35		16	-110	12	0	24	29	0,8	1,2	9°		
GE 25 DN	GE 25 DNSS	25	0	42	0	20		16	-240	29	36		0,6	7°	+3	+8
GE 30 DN	GE 30 DNSS	30	-10	47	-11	22	0	18		34	41		to	6°	-13	-19
GE 35 DN	GE 35 DNSS	35		55		25	-130	20		39	47		1,5	7°		
GE 40 DN	GE 40 DNSS	40		62	0	28		22		45	53	0,6	0,8	7°		
GE 45 DN	GE 45 DNSS	45	0	68	-13	32		25		50	60	to	to	7°	+3	+10
GE 50 DN	GE 50 DNSS	50	-12	75		35	0	28		55	66	1,0	1,7	7°	-15	-23
GE 60 DN	GE 60 DNSS	60		90		44	-160	36		66	80	0,8	1,0	6°		
GE 70 DN	GE 70 DNSS	70	0	105	0	49		40		77	92	to	to	6°	+4	+13
GE 80 DN	GE 80 DNSS	80	-15	120	-15	55	0-190	45		88	105	1,2	2,2	6°	-19	-28

The load combined of the radial load F_r and the axial load F_a shall be calculated as follows:

$F_r + 6\,F_a \leq C_0$, where $F_r > F_a$ in the direction opposite to the assembly slots.
$F_r + 12\,F_a \leq C_0$ in the direction of the assembly slots.

Under radial load the assembly slot shall remain at 90° to the load direction.

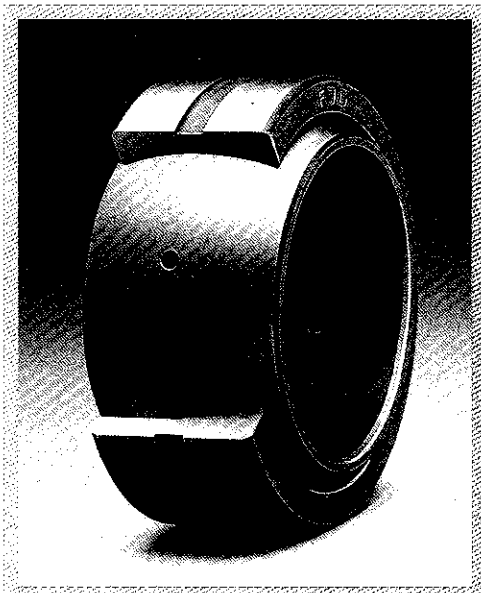
F_r = radial component of the applied load
F_a = axial component of the applied load
Where F_r has to be greater than F_a

Designation

Each bearing is designated as in the following example:

GE 17 DN SS .1 T

- GE 17 DN: Number of standard Dimensions
- SS: with lubrication grooves and hole
- .1: Radial play
- T: Code for dry lubrication



Dimensions in millimetres

Radial play in µm		Static Radial Limit Load Rating C_o in kN	Mass g	Bearing Number	
.1	.2				
		12	3	GE 4 DN	-
		20	4	GE 5 DN	-
1-8	8-16	20	4	GE 6 DN	-
		32	8	GE 8 DN	-
		48	12	GE 10 DN	-
		63	17	GE 12 DN	-
		99	32	GE 15 DN	GE 15 DNSS
1-10	10-20	125	49	GE 17 DN	GE 17 DNSS
		174	65	GE 20 DN	GE 20 DNSS
		284	115	GE 25 DN	GE 25 DNSS
1-12	12-25	366	160	GE 30 DN	GE 30 DNSS
		470	229	GE 35 DN	GE 35 DNSS
		583	315	GE 40 DN	GE 40 DNSS
1-15	15-30	750	460	GE 45 DN	GE 45 DNSS
		924	560	GE 50 DN	GE 50 DNSS
		1440	1100	GE 60 DN	GE 60 DNSS
1-18	18-36	1840	1540	GE 70 DN	GE 70 DNSS
		2362	2290	GE 80 DN	GE 80 DNSS

Procurement Specification DIN 65237

SPHERICAL BEARINGS

Corrosion resisting steel, without slots, according to LN 9367.

Series: **GE...N**
Series: **GE...NSS**
Lubrication grooves and holes

Material
Outer ring: EN 2136 (1.4044.6)
Inner ring: EN 2030 (1.3544.9)

Surface treatment and lubrication

Outer and inner rings:
1201 LN 9368 Part 3

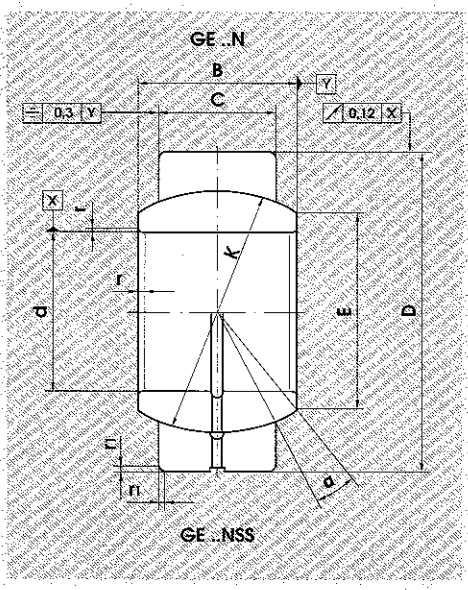
Sliding surfaces:
5902 LN 9368 Part 7

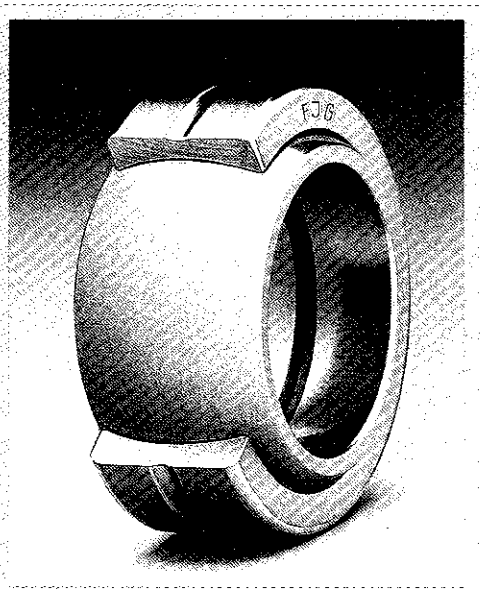
} without code

Outer and inner rings:
1201 LN 9368 Part 3

Sliding surface of inner or outer ring:
5906 LN 9368 Part 7

} code T





Bearing Number		d	Δdmp µm	D	ΔDmp µm	B	ΔBmp µm	C	ΔCmp µm	E min.	K ≈	r	r_1	α	Out of round µm Δds	Out of round µm ΔDs
GE 4 N	-	4		12		5		3		7	9			16°		
GE 5 N	-	5		14	0	6	0	4		9	11	0,3	0,3	13°	+2	+5
GE 6 N	-	6		14	-8	6	-75	4		9	11	to	to	13°	-10	-13
GE 8 N	-	8	0	16		8		5		10	13	0,6	0,8	15°		
GE 10 N	-	10	-8	19		9	0	6		13	16			12°		
GE 12 N	-	12		22	0	10	-90	7		15	18		0,5	11°	+3	+6
GE 15 N	GE 15 NSS	15		26	-9	12		9		18	22	0,5	to	9°	-11	-15
GE 17 N	GE 17 NSS	17		30		14	0	10		20	25	to	1,2	10°		
GE 20 N	GE 20 NSS	20		35		16	-110	12	0	25	30	0,8	0,6	9°	+3	+8
GE 25 N	GE 25 NSS	25	0	42	0	20		16	-240	29	36		to	7°	-13	-19
GE 30 N	GE 30 NSS	30	-10	47	-11	22	0	18		34	41		1,5	6°		
GE 35 N	GE 35 NSS	35		55		25	-130	20		39	47			7°		
GE 40 N	GE 40 NSS	40	0	62	0	28		22		45	53	0,6	0,8	7°	+3	+10
GE 45 N	GE 45 NSS	45	-12	68	-13	32		25		50	60	to	to	7°	-15	-23
GE 50 N	GE 50 NSS	50		75		35	0	28		55	66	1,0	1,7	7°		
GE 60 N	GE 60 NSS	60		90		44	-160	36		66	80	0,8	1,0	6°	+4	+13
GE 70 N	GE 70 NSS	70	0	105	0	49		40		77	92	to	to	6°	-19	-28
GE 80 N	GE 80 NSS	80	-15	120	-15	55	0-190	45		88	105	1,2	2,2	6°		

The load combined of the radial load F_r and the axial load F_a shall be calculated as follows:

$F_r + 6\,F_a \leq C_0$.

F_r = radial component of the applied load
F_a = axial component of the applied load
Where F_r has to be greater than F_a

Designation

Each bearing is designated as in the following example:

GE 17 N SS .1 T

- GE 17 N — Number of standard Dimensions
- SS — with lubrication grooves and hole
- .1 — Radial play
- T — Code for dry lubrication

Dimensions in millimetres

Radial play in µm		Static Radial Limit Load Rating C_o in kN	Mass g	Bearing Number	
.1	.2				
		12	3	GE 2 N	-
		20	4	GE 4 N	-
1-8	8-16	20	4	GE 6 N	-
		32	8	GE 8 N	-
		48	12	GE 10 N	-
		63	17	GE 12 N	-
		99	32	GE 15 N	GE 15 NSS
1-10	10-20	125	49	GE 17 N	GE 17 NSS
		174	65	GE 20 N	GE 20 NSS
		284	115	GE 25 N	GE 25 NSS
1-12	12-25	366	160	GE 30 N	GE 30 NSS
		470	229	GE 35 N	GE 35 NSS
		583	315	GE 40 N	GE 40 NSS
1-15	15-30	750	460	GE 45 N	GE 45 NSS
		924	560	GE 50 N	GE 50 NSS
		1440	1100	GE 60 N	GE 60 NSS
1-18	18-36	1840	1540	GE 70 N	GE 70 NSS
		2362	2290	GE 80 N	GE 80 NSS

Procurement Specification DIN 65237

SPHERICAL BEARINGS

Slotted type, according to BNAé Pr.L 31 512 and Pr.L 26 112.

Series: **GL ...**
Material: EN 2031 (1.3505.9)

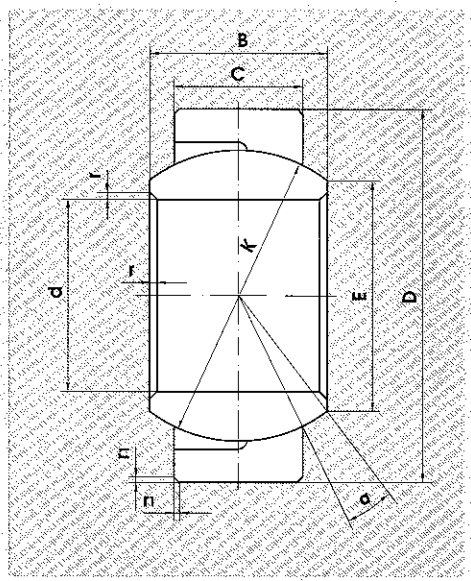
Series: **GLD...**
Material: EN 2031 (1.3505.9)

Series: **GLS...**
Material: EN 2031 (1.3505.9)

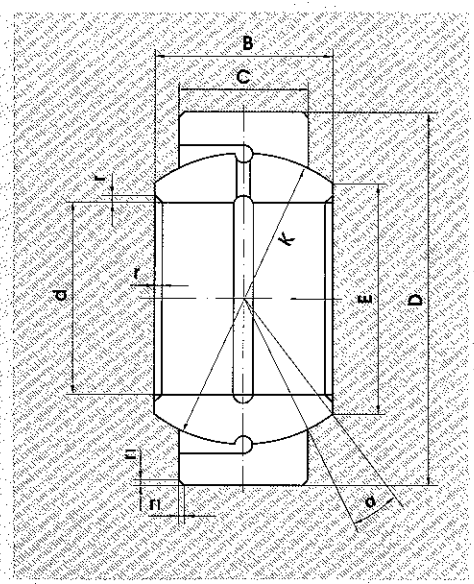
Series: **GL...1.3544.9**
Material: EN 2030 (1.3544.9)

Series: **GLD...1.3544.9**
Material: EN 2030 (1.3544.9)

Series: **GLS...1.3544.9**
Material: EN 2030 (1.3544.9)



GL-GLD



GLS

Bearing Number			d		D		B		C		E	K	r	r_1	α
				Δdmp µm		ΔDmp µm		ΔBmp µm		ΔCmp µm					
GL 4	GLD 4	-	4		12		5		3		6,2	8,0			16°
GL 5	GLD 5	-	5		14		6	0	4		8,0	10,0	0,4		13°
GL 6	GLD 6	-	6		14	0	6	-75	4		8,0	10,0	to	0,4	13°
GL 8/16	GLD 8/16	GLS 8/16	8	0	16	-7	8		5	0	10,2	13,0	0,7	to	15°
GL 8	GLD 8	GLS 8	8	-7	17		8		5	-75	10,2	13,0		0,7	15°
GL 10/19	GLD 10/19	GLS 10/19	10		19		9	0	6		13,2	16,0			12°
GL 10	GLD 10	GLS 10	10		20		9	-90	6		13,2	16,0			12°
GL 12	GLD 12	GLS 12	12		22	0	10		7		15,0	18,0	0,5		11°
GL 14	GLD 14	GLS 14	14		25	-8	11		8		16,7	20,0	to	0,7	10°
GL 15	GLD 15	GLS 15	15	0	28		12		9	0	18,5	22,0	0,8	to	9°
GL 16	GLD 16	GLS 16	16	-8	28		12	0	9	-90	18,5	22,0		1,2	9°
GL 17	GLD 17	GLS 17	17		32		14	-110	10		20,7	25,0			10°
GL 18	GLD 18	GLS 18	18		32	0	14		10		21,9	26,0			10°
GL 20	GLD 20	GLS 20	20	0	35	-9	16		12	0	24,2	29,0	0,7	0,9	9°
GL 25	GLD 25	GLS 25	25	-9	42		20		16	-110	29,3	35,5	to	to	7°
GL 30/47	GLD 30/47	GLS 30/47	30		47		22	0	18		34,2	40,7	1,1	1,3	6°
GL 35	GLD 35	GLS 35	35		55		25	-130	20		39,8	47,0			7°
GL 40	GLD 40	GLS 40	40	0	62	0	28		22	0	45,0	53,0			7°
GL 45/68	GLD 45/68	GLS 45/68	45	-11	68	-11	32		25	-130	50,9	60,0			7°
GL 50	GLD 50	GLS 50	50		75		35	0	28		56,0	66,0	1,2	1,2	7°
GL 55	GLD 55	GLS 55	55		85		40	-160	32		62,2	74,0	to	to	7°
GL 60	GLD 60	GLS 60	60	0	90	0	44		36	0	66,8	80,0	1,7	1,7	6°
GL 70	GLD 70	GLS 70	70	-12	105	-13	49		40	-160	77,9	92,0			6°
GL 80	GLD 80	GLS 80	80		120		55	0-190	45		89,5	105,0			6°

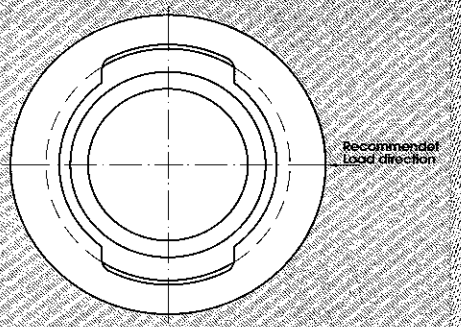
The load combined of the radial load F_r and the axial load F_a shall be calculated as follows:

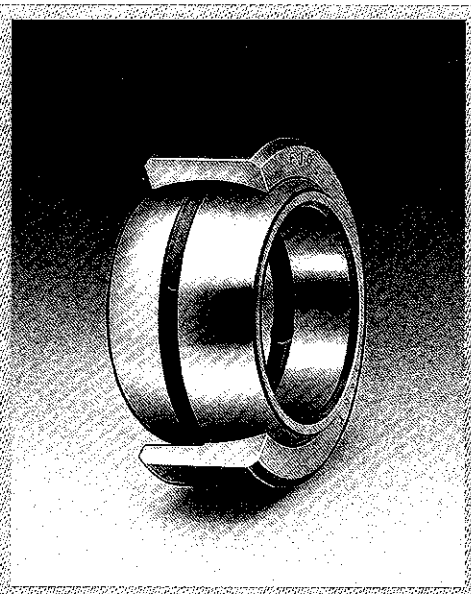
$F_r + 6\,F_a \leq C_0$, where $F_r > F_a$ in the direction opposite to the assembly slots.
$F_r + 12\,F_a \leq C_0$ in the direction of the assembly slots.

Under radial load the assembly slot shall remain at 90° to the load direction.

F_r = radial component of the applied load
F_a = axial component of the applied load
Where F_r has to be greater than F_a

Lubricant: NATO G354/MIL-G-23 827





Dimensions in millimetres

Axial play in µm		Static Radial Limit Load Rating C_o in kN	Mass g	Bearing Number		
GL	GLD/GLS					
		12	3	GL 4	GLD 4	-
		20	4	GL 5	GLD 5	-
		20	4	GL 6	GLD 6	-
		32	8	GL 8/16	GLD 8/16	GLS 8/16
		32	10	GL 8	GLD 8	GLS 8
		48	12	GL 10/19	GLD 10/19	GLS 10/19
		48	13	GL 10	GLD 10	GLS 10
0	30	63	17	GL 12	GLD 12	GLS 12
to	to	80	22	GL 14	GLD 14	GLS 14
30	60	99	32	GL 15	GLD 15	GLS 15
		99	33	GL 16	GLD 16	GLS 16
		125	49	GL 17	GLD 17	GLS 17
		130	50	GL 18	GLD 18	GLS 18
		174	65	GL 20	GLD 20	GLS 20
		284	115	GL 25	GLD 25	GLS 25
		366	160	GL 30/47	GLD 30/47	GLS 30/47
		470	229	GL 35	GLD 35	GLS 35
0	40	583	315	GL 40	GLD 40	GLS 40
to	to	750	460	GL 45/68	GLD 45/68	GLS 45/68
40	80	924	560	GL 50	GLD 50	GLS 50
		1184	805	GL 55	GLD 55	GLS 55
0	50	1440	1100	GL 60	GLD 60	GLS 60
to	to	1840	1540	GL 70	GLD 70	GLS 70
50	100	2362	2290	GL 80	GLD 80	GLS 80

Designation

Each bearing is designated as in the following example:

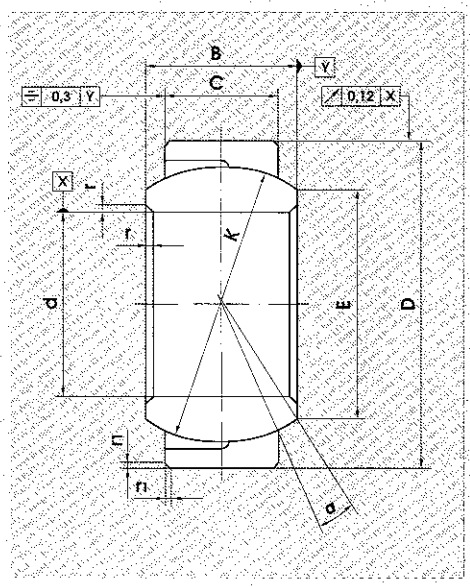
GL 17
GLD 17
GLS 17

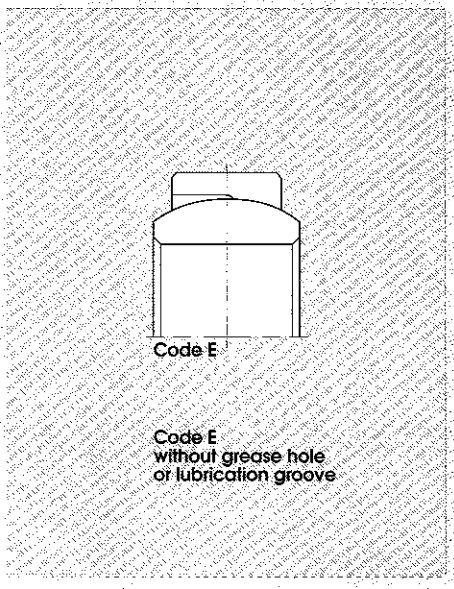
Series designation — Dimensions

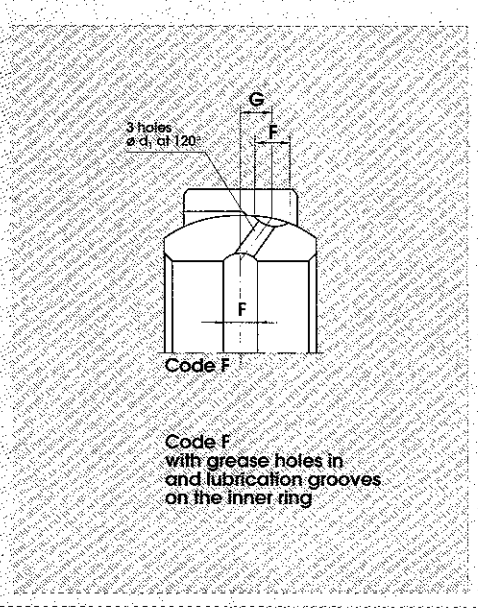
SPHERICAL BEARINGS

With assembly slots.

Series: **EN 2336**
Material
Outer ring: EN 2031 (1.3505) hardness HRc 58-62
Inner ring: EN 2031 (1.3505) hardness HRc 60-63







Dash No.	d	Δdmp µm	D	ΔDmp µm	B	ΔBmp µm	C	ΔCmp µm	E min.	K ≈	r	r_1	α	d_1	F Δdmp µm	F	ΔFmp µm
05	5		14	0	6	0	4		8	10	0,3	0,3	13°	-		-	
06	6		14	-8	6	-75	4		8	10	to	to	13°	-		-	
08	8	0	16		8	0	5		10	13	0,6	0,8	15°	-		-	
10	10	-8	19	0	9	-90	6		13	16	0,5		12°	-		-	
12	12		22	-9	10		7		15	18	to	0,5	11°	-		-	
15	15		26		12	0	9		18	22	0,8	to 1,2	8°	1,5		2,8	
17	17		30		14	-110	10		20	25			10°	2,0		2,8	
20	20	0	35	0	16		12		24	29	0,7	0,6	9°	2,0		2,9	
25	25	-10	42	-11	20		16	-250	29	36	to	to	7°	2,5	±200	4,0	±200
30	30		47		22	0	18		34	41	1,1	1,5	6°	2,5		4,0	
35	35		55		25	-130	20		39	47			6°	2,5		4,0	
40	40	0	62	0	28		22		45	53			7°	2,5		4,0	
45	45	-12	68	-13	32		25		50	60			7°	2,5		4,0	
50	50		75		35	0	28		55	66	1,2 to 1,7	0,8 to 1,7	6°	2,5		4,0	
60	60	0	90	0	44	-160	36		66	80			6°	3,0		4,5	
70	70	-15	105	-15	49		40		77	92			6°	3,0		4,5	
80	80		120		55	0-190	45		88	105			6°	4,0		5,0	

1) These loads can only be applied at 90° with respect to the opening of the slots
2) These loads shall be applied in the direction of the unslotted face of the outer ring
Dash-No. 05-12 without lubrication groove and holes

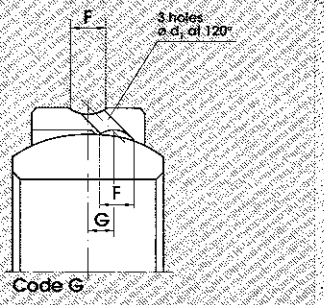
Procurement Specification EN 2337

Designation

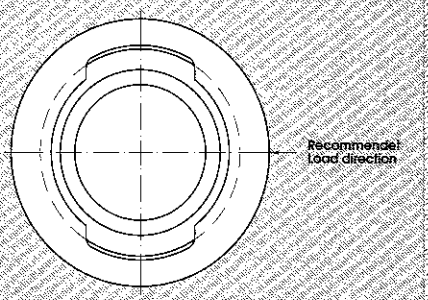
Each bearing is designated as in the following example:

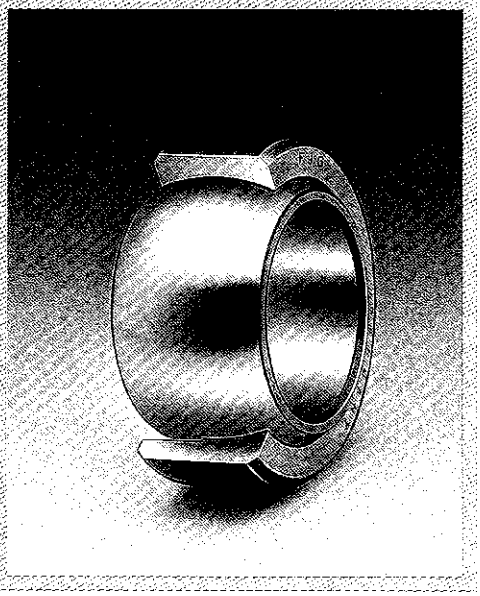
EN 2336 A P 15 E

- EN 2336 — Number of EN standard
- A — Grease type
- P — Radial and axial play
- 15 — Dash No.
- E — Type of lubrication



Code G
with grease hole and
lubrication grooves
on the outer ring





Dimensions in millimetres

G	ΔGmp	Out of round µm		Internal clearance µm				Permissible radial load in kN		Mass	Bearing Number
	µm	Δds	ΔDs	Axial Suffix N	Axial Suffix P	Radial max. Suffix N	Radial max. Suffix P	Radial [1]	Axial [2]	g	
-			+5					12	0,68	4	05
-		+2	-13					16	0,90	4	06
-		-10						26	1,50	7	08
-			+6	30	1			45	2,30	11	10
-		+3	-15	to	to	15	8	60	3,20	15	12
2,2		-11		60	30			90	5,55	28	15
2,5								110	6,95	44	17
3,0			+8					160	9,85	60	20
4,0	+100	+3	-19					270	18,15	105	25
4,5	0	-13						380	25,16	145	30
5,0								500	30,00	210	35
5,5		+3	+10	40	1			630	36,66	285	40
6,2		-15	-23	to	to	20	10	820	48,10	420	45
7,0				80	40			1000	60,96	515	50
9,0				50	1			1600	102,76	1050	60
10,0		+4	+13	to	to	25	15	2000	127,80	1510	70
12,0		-19	-28	100	50			2600	182,80	2250	80

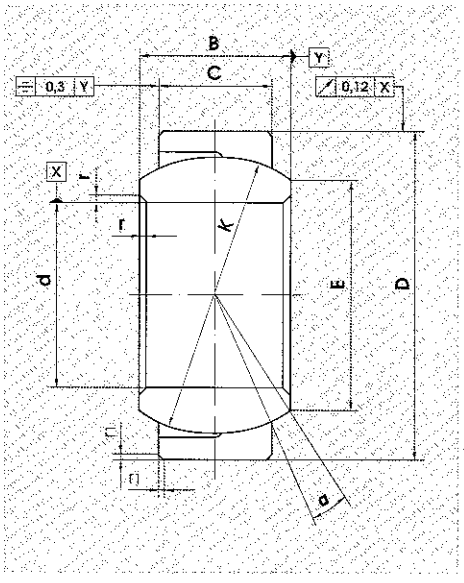
Grease type: A = NATO G 354/MIL-G-23 827
B = NATO G 395/MIL-G-81 322
In both cases the spherical surfaces shall be smeared with a dry film lubricant Molykote 3400 A MIL-L-46010 A

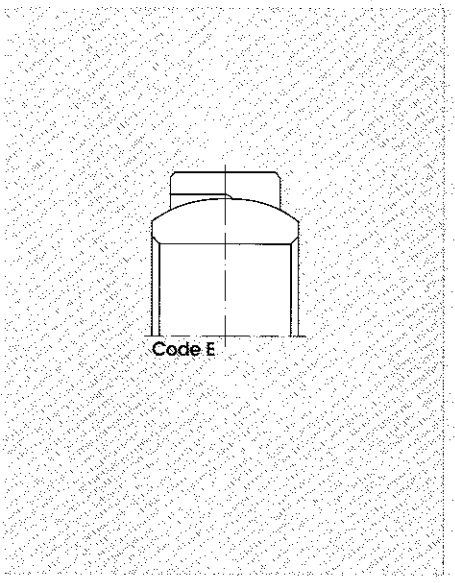
Suffix N = internal clearance normal
Suffix P = internal clearance reduced

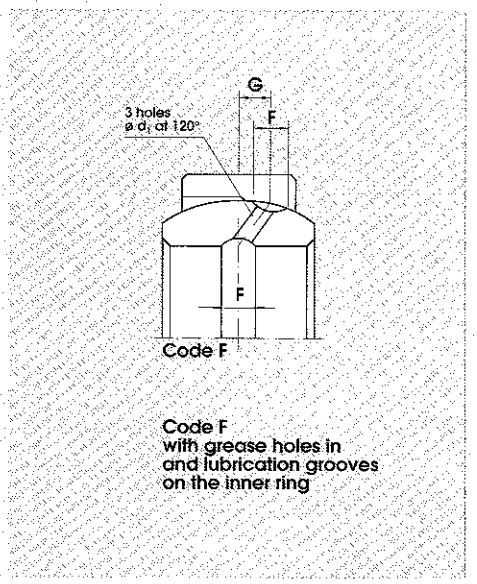
SPHERICAL BEARINGS

Corrosion resisting steel with assembly slots.

Series: **EN 2588**
Material
Outer ring: EN 2030 (1.3544) hardness HRc 58 min.
Inner ring: EN 2030 (1.3544) hardness HRc 55-62







Dash No.	d	Δdmp µm	D	ΔDmp µm	B	ΔBmp µm	C	ΔCmp µm	E min.	K ≈	r	r1	α	d1	F	Δdmp µm	ΔFmp µm
05	5		14	0	6	0	4		8	10	0,3	0,3	13°	-	-		
06	6		14	-8	6	-75	4		8	10	to	to	13°	-	-		
08	8	0	16		8	0	5		10	13	0,6	0,8	15°	-	-		
10	10	-8	19	0	9	-90	6		13	16	0,5		12°	-	-		
12	12		22	-9	10		7		15	18	to	0,5	11°	-	-		
15	15		26		12	0	9		18	22	0,8	to 1,2	8°	1,5	2,8		
17	17		30		14	-110	10		20	25			10°	2,0	2,8		
20	20	0	35	0	16		12		24	29	0,7	0,6	9°	2,0	2,9		
25	25	-10	42	-11	20		16	-250	29	36	to	to	7°	2,5	4,0	±200	±200
30	30		47		22	0	18		34	41	1,1	1,5	6°	2,5	4,0		
35	35		55		25	-130	20		39	47			6°	2,5	4,0		
40	40	0	62	0	28		22		45	53			7°	2,5	4,0		
45	45	-12	68	-13	32		25		50	60			7°	2,5	4,0		
50	50		75		35	0	28		55	66	1,2	0,8	6°	2,5	4,0		
60	60	0	90	0	44	-160	36		66	80	to	to	6°	3,0	4,5		
70	70	-15	105	-15	49		40		77	92	1,7	1,7	6°	3,0	4,5		
80	80		120		55	0-190	45		88	105			6°	4,0	5,0		

1) These loads can only be applied at 90° with respect to the opening of the slots
2) These loads shall be applied in the direction of the unslotted face of the outer ring
Dash-No. 05-12 without lubrication groove and holes

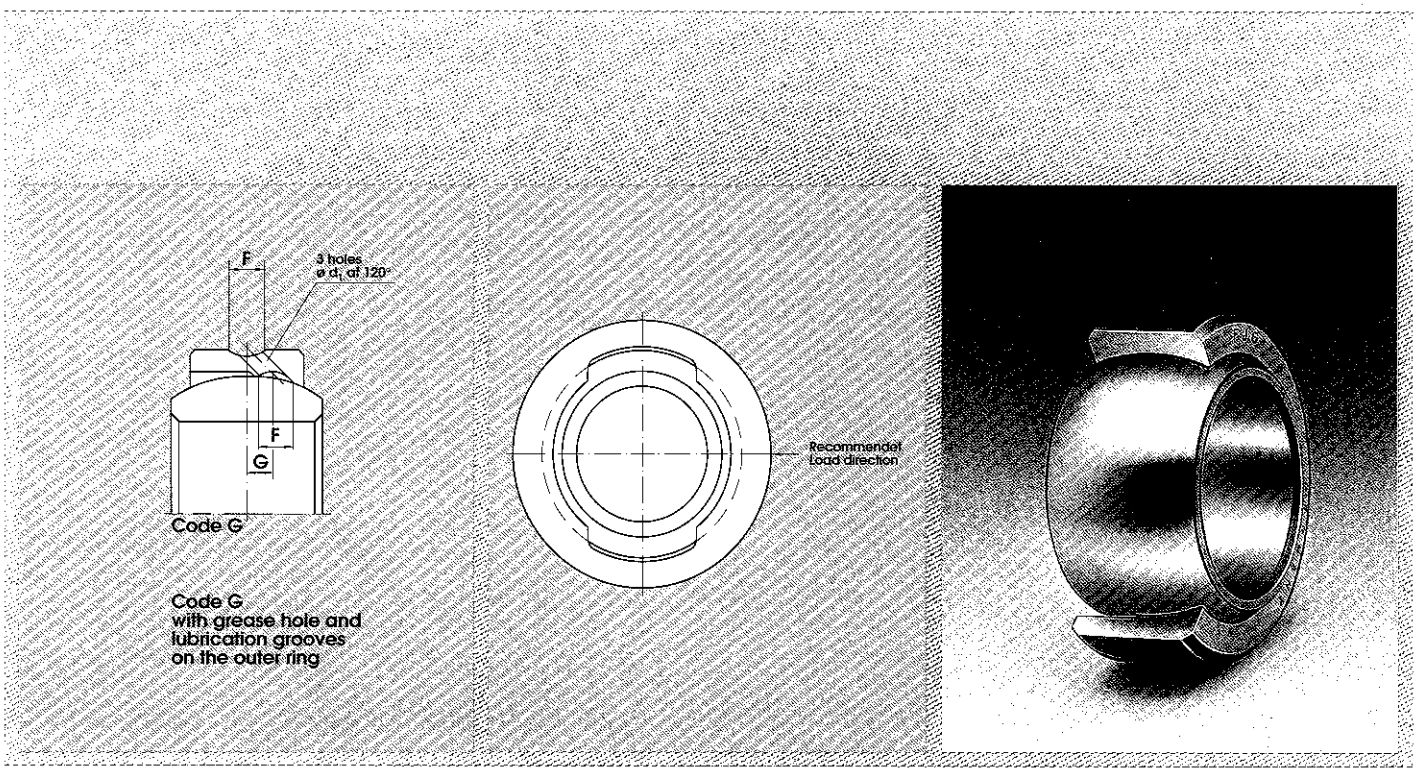
Procurement Specification EN 2337

Designation

Each bearing is designated as in the following example:

EN 2588 A P 15 E

- EN 2588 — Number of EN standard
- A — Grease type
- P — Radial and axial play
- 15 — Dash No.
- E — Type of lubrication



Dimensions in millimetres

G	Out of round µm		Internal clearance µm				Permissible Radial Load in kN		Mass g	Bearing Number
	ΔGmp µm	Δds	ΔDs	Axial Suffix N	Axial Suffix P	Radial max. Suffix N	Radial max. Suffix P	Radial [1]	Axial [2]		
-			+5					12	0,68	4	05
-		+2	-13					16	0,90	4	06
-		-10						26	1,50	7	08
-								45	2,30	11	10
-			+6	30	1			60	3,20	15	12
2,2		+3	-15	to	to	15	8	90	5,55	28	15
2,5		-11		60	30			110	6,95	44	17
3,0			+8					160	9,85	60	20
4,0	+100	+3	-19					270	18,15	105	25
4,5	0	-13						380	25,16	145	30
5,0								500	30,00	210	35
5,5				40	1			630	36,66	285	40
6,2		+3	+10	to	to	20	10	820	48,10	420	45
7,0		-15	-23	80	40			1000	60,96	515	50
9,0				50	1			1600	102,76	1050	60
10,0		+4	+13	to	to	25	15	2000	127,80	1510	70
12,0		-19	-28	100	50			2600	182,80	2250	80

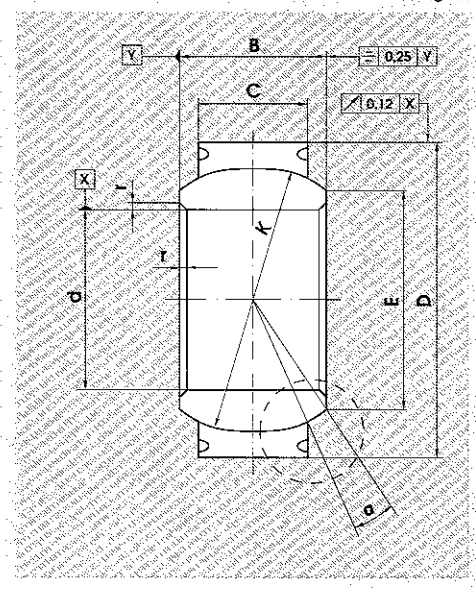
Grease type: A = NATO G 354/MIL-G-23 827
B = NATO G 395/MIL-G-81 322
In both cases the spherical surfaces shall be smeared with a dry film lubricant Molykote 3400 A MIL-L-46010 A

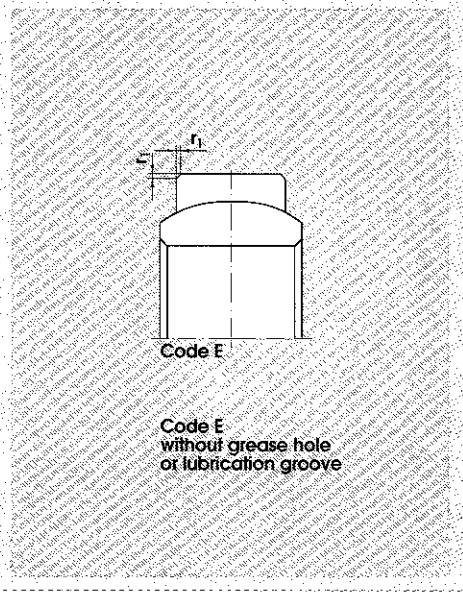
Suffix N = internal clearance normal
Suffix P = internal clearance reduced

SPHERICAL BEARINGS

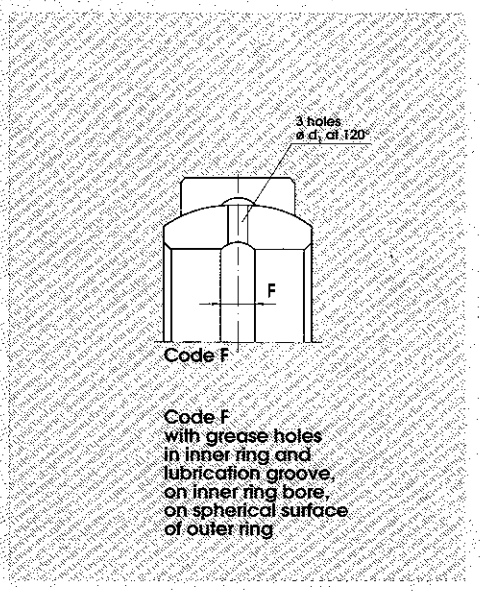
Corrosion resisting steel without slots.

Series: **EN 2335** Inner ring: EN 2030 (1.3544) hardness HRc 55-62
Material Outer ring: EN 2136 or EN 2539 (1.4044.6) or (1.4548.3) hardness after forming HRc 23-40





Code E without grease hole or lubrication groove



Code F with grease holes in inner ring and lubrication groove, on inner ring bore, on spherical surface of outer ring

Dash No.	d	D		B	C	E	K	r	r_1	A		R	P	T
		Δdmp µm	ΔDmp µm	ΔBmp µm	ΔCmp µm	min.	≈				ΔAmp µm	+100	-200	max.
04	4		12		3	6	9		0,4	-				
05	5		14	0	6	4	8	11	0,3	to	-				
06	6		14	-8	6	4	8	11	to	0,7	-		-	-	0,5
08	8		16		8	5	10	13	0,6	0,5	-				
10	10	0	19		9	6	13	16		to 0,8	-				
12	12	-8	22	0	10	7	15	18		0,6	20,2				
15	15		26	-9	12	9	18	22		to	24,2				
15 [1]	15		26		12	9	18	22		1,0	24,0				
17	17		30		14	10	20	25			28,2	0,2	0,7		
17 [1]	17		30		14	10	20	25	0,5		28,0				
20	20		35	0	16	12	24	30	to		33,2	+100			0,8
20 [1]	20	0	35	-11	16	12	24	30	0,8	0,9	33,0	0			
25	25	-10	42		20	16	29	36		to	39,4				
25 [1]	25		42		20	16	29	36		1,3	38,9				
30	30		47		22	18	34	41			44,4		0,9		
30 [1]	30		47		22	18	34	41			43,8				
35	35	0	55	0	25	20	39	47	0,6		51,8	0,3			
40	40	-12	62	-13	28	22	45	53	to		58,8				
45	45		68		32	25	50	60	1,0	1,4	64,8		1,4	1,0	
50	50		75		35	28	55	66	1,2	to	71,8				
60	60	0-15	90	0-15	44	36	66	80	to 1,7	1,8	86,8				

[1] Code 1 to be added to the end of the identity block
Dash-No. 05-12 without lubrication groove and holes

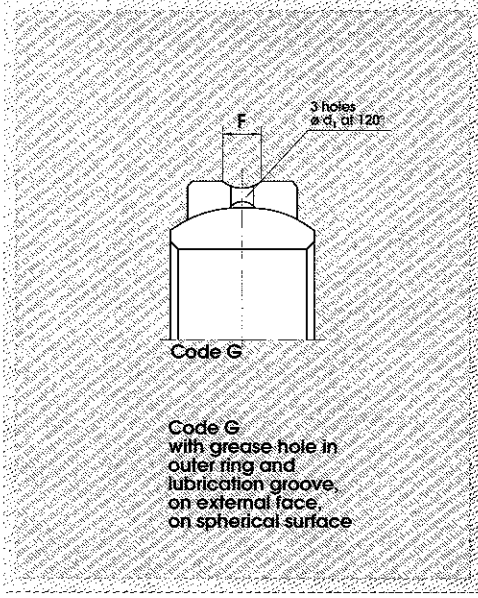
Procurement Specification EN 2337

Designation

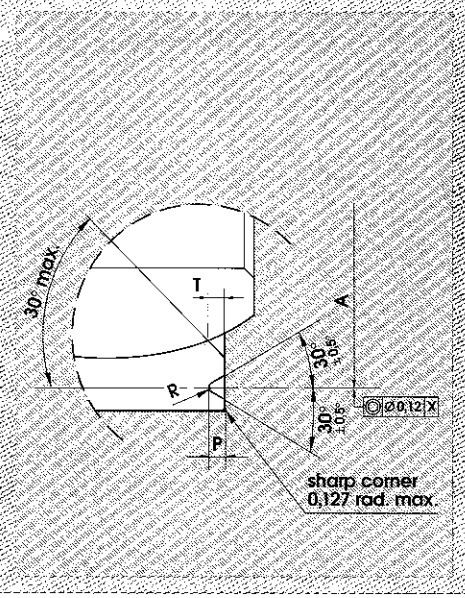
Each bearing is designated as in the following example:

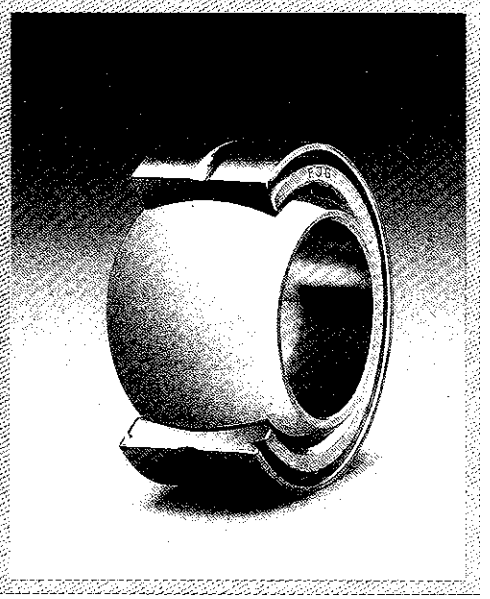
EN 2335 A P 15 E R T 1

- Number of EN standard
- Grease type
- Radial and axial play
- Dash No.
- Type of lubrication
- Type of mounting
- Passivated ISO 8075
- Mounting grooves deeper than normal



Code G
with grease hole in outer ring and lubrication groove, on external face, on spherical surface





Dimensions in millimetres

d_1	F	α	Out of round µm		Static Limit Load Rating in kN		Radial play max. in µm		Axial play in µm		Mass g	Dash No.
							Suffix N	Suffix P	Suffix N	Suffix P		
±200	±200		Δds	ΔDs	Radial C_s	Axial C_a						
		16°			7,2	0,45					3	04
		13°	+2	+5	12,6	0,8					5	05
-	-	13°	-10	-13	16,0	1,0					5	06
		15°			21,0	1,8			30	5	8	08
		12°			31,0	2,5	20	10	to	to	12	10
		11°		+6	40,5	3,5			75	35	17	12
		8°		-15	70,0	5,3					32	15
1,5	2,8	8°	+3		70,0	5,3					32	15 [1]
		10°	-11		91,4	6,7					49	17
		10°			91,4	6,7					49	17 [1]
2	2,9	9°			130,0	9,8	25	12	40 to 80	5 to 40	65	20
		9°		+8	130,0	9,8					65	20 [1]
		7°	+3	-19	216,7	18,0					115	25
		7°	-13		216,7	18,0			50	5	115	25 [1]
		6°			277,5	25,0	30	15	to	to	160	30
		6°			277,5	25,0			100	50	160	30 [1]
2,5	4	6°			359,9	31,0					230	35
		7°	+3	+10	428,8	38,0					315	40
		7°	-15	-23	558,4	50,0			60	5	460	45
		6°			760,1	64,0	35	20	to	to	560	50
3	4,5	6°	+4-19	+13-28	1056,0	104,0			120	60	1100	60

Grease type: A = NATO G 354/MIL-G-23 827
B = NATO G 395/MIL-G-81 322
In both cases the spherical surfaces shall be smeared with a dry film lubricant Molykote 3400 A MIL-L-46010 A

Suffix N = internal clearance normal
Suffix P = internal clearance reduced

Type of mounting: S = without mounting grooves
R = with mounting grooves

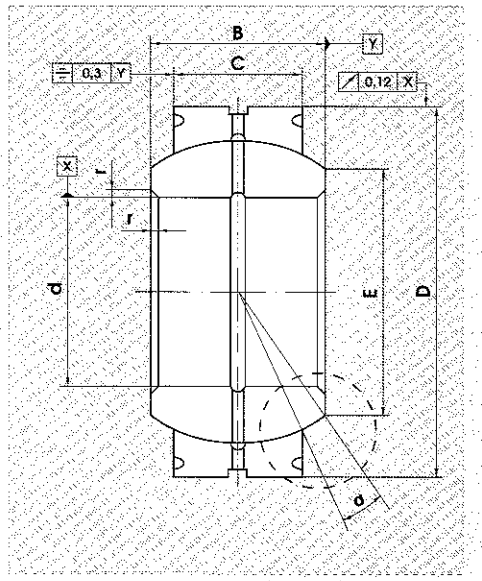
SPHERICAL BEARINGS

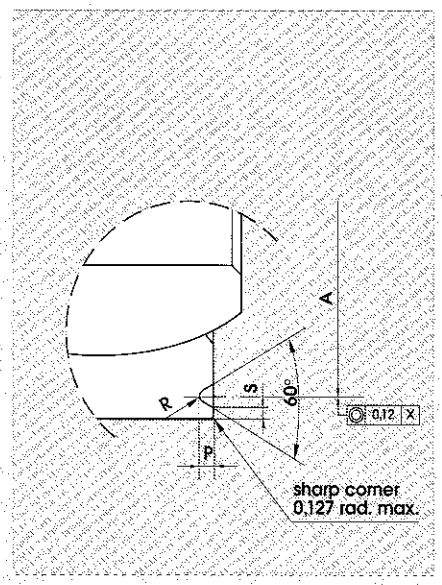
Without slots, with mounting grooves, dimensions according to MS 21 154.

Series: **FMGN...**
Material
Outer ring: Bronze 2.0966
Cadmium plated,
yellow passivated
Inner ring: EN 2031 (1.3505.9)
Chromium plated

Series: **FMGN...·1**
Material
Outer ring: EN 2214 (1.7734.6)
Cadmium plated,
yellow passivated
Inner ring: EN 2031 (1.3505.9)
Chromium plated

Series: **FMGN...·3**
Material
Outer ring: EN 2539 (1.4548.4)
Inner ring: EN 2030 (1.3544.9)





Bearing Number	d		D		B		C		E	A	P		R		r_1 x 45°	α
		Δdmp µm		ΔDmp µm		ΔBmp µm		ΔCmp µm	min.		ΔAmp µm	ΔPmp µm				
FMGN 3/ 3.1/ 3.3	4,826		14,287		7,137		5,537		7,442	12,750			0,762	0,127		10°
FMGN 4/ 4.1/ 4.3	6,350		16,667		8,712		6,350		9,246	15,140				to 0,381		10°
FMGN 5/ 5.1/ 5.3	7,937		19,050		9,525		7,137		10,643	16,560						10°
FMGN 6/ 6.1/ 6.3	9,525		20,637		10,312		7,925		12,065	18,140			1,016			9°
FMGN 7/ 7.1/ 7.3	11,112	0	23,017	0	11,100	0	8,712		13,462	20,520	0	0			0,127	8°
FMGN 8/ 8.1/ 8.3	12,700	-12	25,400	-12	12,700	-51	9,906	±127	15,240	22,300	-254	-381		0,254	to	8°
FMGN 9/ 9.1/ 9.3	14,287		27,780		14,275		11,100		17,018	24,690				to	0,381	8°
FMGN 10/10.1/10.3	15,875		30,162		15,875		12,700		18,771	27,050				0,508		8°
FMGN 12/12.1/12.3	19,050		36,512		19,050		15,062		23,368	33,400			1,524			8°
FMGN 14/14.1/14.3	22,225		39,687		22,225		17,856		24,892	36,580						8°
FMGN 16/16.1/16.3	25,400		44,450		25,400		20,244		28,397	41,350						9°

All Dimensions to be met after plating

Lubricant: Grease MIL-G-21164/NATO G 353

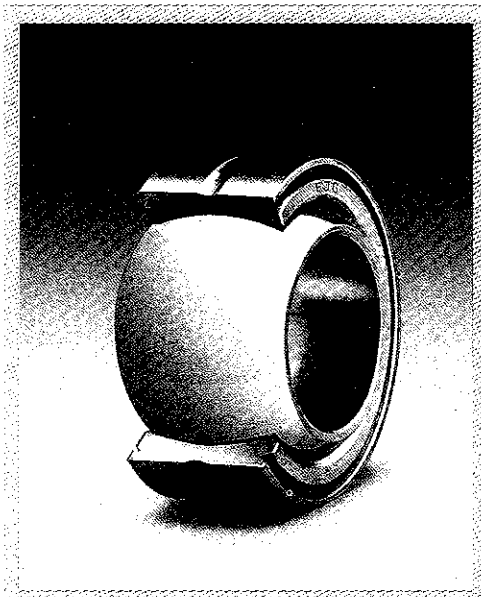
Procurement Specification MIL-B-8976

Designation

Each bearing is designated as in the following example:

FMGN 5 ·1 O AX .6

Bearing Number
Material-Code
Suffix O = without lubrication grooves
Outerring slideways treated with Molykote sliding varnish 3400A MIL-L-46 010 A
Suffix AX = reduced Axial play



Dimensions in millimetres

S	ΔSmp	Internal clearance µm		Axial play µm		FMGN Static Limit Load Rating in kN		FMGN...·1 Static Limit Load Rating in kN		FMGN...·3 Static Limit Load Rating in kN		Mass g	Bearing Number
	µm	Radial	Axial	Suffix A	Suffix AX	Radial	Axial	Radial	Axial	Radial	Axial		
0,508						12,5	3,8	20,5	9,3	28,4	12,9	6	FMGN 3/ 3.1/ 3.3
						19,1	4,9	31,5	12,3	41,7	16,7	10	FMGN 4/ 4.1/ 4.3
						23,1	6,2	37,8	15,8	60,4	26,2	13	FMGN 5/ 5.1/ 5.3
						30,0	7,8	49,2	19,6	75,1	30,0	17	FMGN 6/ 6.1/ 6.3
		13	0	0	0	37,8	9,6	61,8	24,0	94,2	37,7	21	FMGN 7/ 7.1/ 7.3
0,762	-254	to	to	to	to	51,2	12,5	83,3	31,4	126,2	48,5	29	FMGN 8/ 8.1/ 8.3
		51	254	229	80	69,4	15,8	113,4	39,6	164,5	58,7	39	FMGN 9/ 9.1/ 9.3
						86,7	20,7	142,1	52,0	217,8	80,6	49	FMGN 10/10.1/10.3
						126,8	29,2	207,9	73,4	346,7	123,8	92	FMGN 12/12.1/12.3
						170,4	41,4	279,1	103,6	471,0	171,1	118	FMGN 14/14.1/14.3
						226,9	53,4	370,7	133,4	582,3	215,6	174	FMGN 16/16.1/16.3

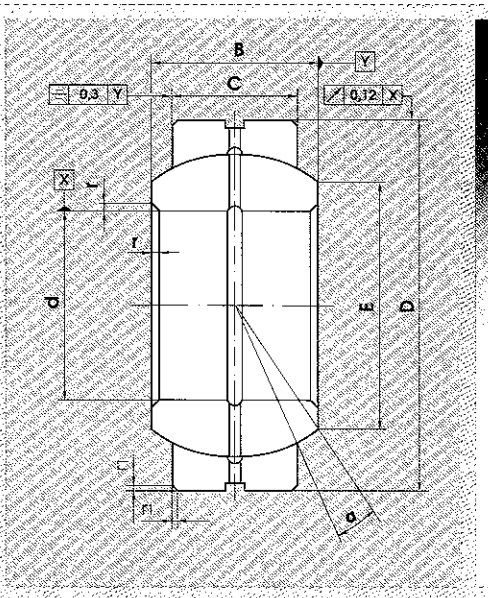
SPHERICAL BEARINGS

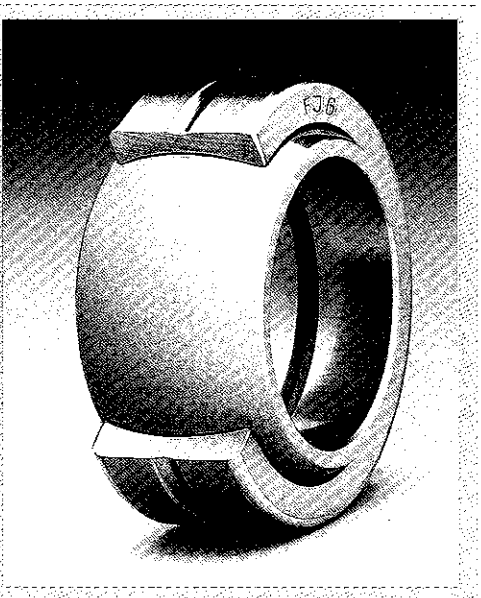
Without slots, dimensions according to MS 21 155.

Series: **FMGS...**
Material
Outer ring: 2.0966
Cadmium plated, yellow passivated
Inner ring: EN 2031 (1.3505.9)
Chromium plated

Series: **FMGS...·1**
Material
Outer ring: EN 2214 (1.7734.6)
Cadmium plated, yellow passivated
Inner ring: EN 2031 (1.3505.9)
Chromium plated

Series: **FMGS...·3**
Material
Outer ring: EN 2539 (1.4548.4)
Inner ring: EN 2030 (1.3544.9)





Bearing Number	d	D		B		C		E	r x 45°	r_1 x 45°	α	Internal clearance µm		Axial play µm	
		Δdmp µm		ΔDmp µm	ΔBmp µm		ΔCmp µm	min.				Radial	Axial	Suffix A	Suffix AX
FMGS 3/ 3.1/ 3.3	4,826		14,287			5,537		7,442			10°				
FMGS 4/ 4.1/ 4.3	6,350		16,667			6,350		9,246			10°				
FMGS 5/ 5.1/ 5.3	7,937		19,050			7,137		10,643			10°				
FMGS 6/ 6.1/ 6.3	9,525		20,637			7,925		12,065			9°				
FMGS 7/ 7.1/ 7.3	11,112	0	23,017	0	0	8,712		13,462	0,127	0,254	8°	13	0	0	0
FMGS 8/ 8.1/ 8.3	12,700	-12	25,400	-12	-51	9,906	±127	15,240	to	to	8°	to	to	to	to
FMGS 9/ 9.1/ 9.3	14,287		27,780			11,100		17,018	0,381	1,016	8°	51	254	229	80
FMGS 10/10.1/10.3	15,875		30,162			12,700		18,771			8°				
FMGS 12/12.1/12.3	19,050		36,512			15,062		23,368			8°				
FMGS 14/14.1/14.3	22,225		39,687			17,856		24,892			8°				
FMGS 16/16.1/16.3	25,400		44,450			20,244		28,397			9°				

All Dimensions to be met after plating

Lubricant: Grease MIL-G-21164/NATO G 353

Procurement Specification MIL-B-8976

Designation

Each bearing is designated as in the following example:

FMGS 5 ·3 O AX .6

Bearing Number
Material-Code
Suffix O = without lubrication grooves
Outerring slideways treated with Molykote sliding varnish 3400A MIL-L-46 010 A
Suffix AX = reduced Axial play

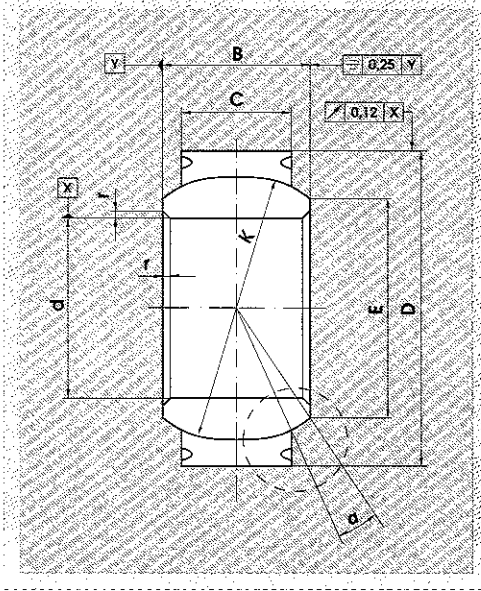
Dimensions in millimetres

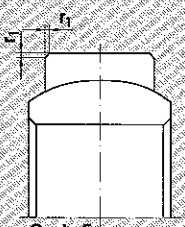
FMGS Static Limit Load Rating in kN		FMGS...-1 Static Limit Load Rating in kN		FMGS...-3 Static Limit Load Rating in kN		Mass g	Bearing Number
Radial	Axial	Radial	Axial	Radial	Axial		
12,5	3,8	20,5	9,3	28,4	12,9	6	FMGS 3/ 3.1/ 3.3
19,1	4,9	31,5	12,3	41,7	16,7	10	FMGS 4/ 4.1/ 4.3
23,1	6,2	37,8	15,8	60,4	26,2	13	FMGS 5/ 5.1/ 5.3
30,0	7,8	49,2	19,6	75,1	30,0	17	FMGS 6/ 6.1/ 6.3
37,8	9,6	61,8	24,0	94,2	37,7	21	FMGS 7/ 7.1/ 7.3
51,2	12,5	83,3	31,4	126,2	48,5	29	FMGS 8/ 8.1/ 8.3
69,4	15,8	113,4	39,6	164,5	58,7	39	FMGS 9/ 9.1/ 9.3
86,7	20,7	142,1	52,0	217,8	80,6	49	FMGS 10/10.1/10.3
126,8	29,2	207,9	73,4	346,7	123,8	92	FMGS 12/12.1/12.3
170,4	41,4	279,1	103,6	471,0	171,1	118	FMGS 14/14.1/14.3
226,9	53,4	370,7	133,4	582,3	215,6	174	FMGS 16/16.1/16.3

SPHERICAL BEARINGS

Corrosion resisting steel without slots, dimensions according to EN 6046.

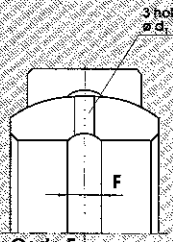
Series: **EN 6046**
Material
Outer ring: EN 2539 (1.4548.3)
hardness HRc 28-38 before swaging
Inner ring: EN 2030 (1.3544)
hardness HRc 55-62





Code E

Code E
without grease hole
or lubrication groove



Code F

Code F
with grease holes
in inner ring and
lubrication groove,
on inner ring bore,
on spherical surface
of outer ring

Dash No.	d	Δdmp µm	D	ΔDmp µm	B	ΔBmp µm	C	ΔCmp µm	E min.	K ≈	r	r1	A	ΔAmp µm	P 0 -250	R	⊕ ±0,5°
03	4,826		14,288		7,14		5,54		7,44	10,4		0,39	12,70			0,127	
04	6,350		16,667	0 -8	8,71		6,35		9,25	12,7		to	15,09		0,64	to	20°
05	7,937		19,050		9,53		7,14		10,64	14,2		0,64	16,76			0,254	
06	9,525		20,638		10,31		7,92		12,07	16,0			18,08		0,89		
07	11,113		23,017		11,10		8,71		13,46	17,5		0,51	20,47				
08	12,700		25,400	0 -9	12,70		9,91		15,24	19,8		to	22,25				
09	14,288		27,780		14,27		11,10		17,02	22,1	0,13	0,76	24,64				
10	15,875	0	30,163		15,88	0	12,70	+130	18,77	24,6	to		27,00	0			
12	19,050	-13	36,513	0	19,05	-50	15,06	0	23,37	30,2	0,38		33,35	-200		0,254	
14	22,225		39,688	-11	22,23		17,86		24,89	33,3			36,53			to	30°
16	25,400		44,450		25,40		20,24		28,40	38,1		0,77	41,30		1,4	0,432	
20	31,750		50,800		27,76		23,93		36,42	45,7		to	47,65				
24	38,100		61,913	0 -13	33,32		28,70		46,41	57,2		1,02	58,75				
28	44,450		71,438		38,89		33,45		50,70	64,0			68,28				
32	50,800		80,963		44,45		38,23		61,98	76,2			77,83				

Procurement Specification EN 2337

Designation

Each bearing is designated as in the following example:

EN 6046 A P 16 E R

- EN 6046 — Number of EN standard
- A — Grease type
- P — Radial and axial play
- 16 — Dash-No.
- E — Type of lubrication
- R — Type of mounting grooves