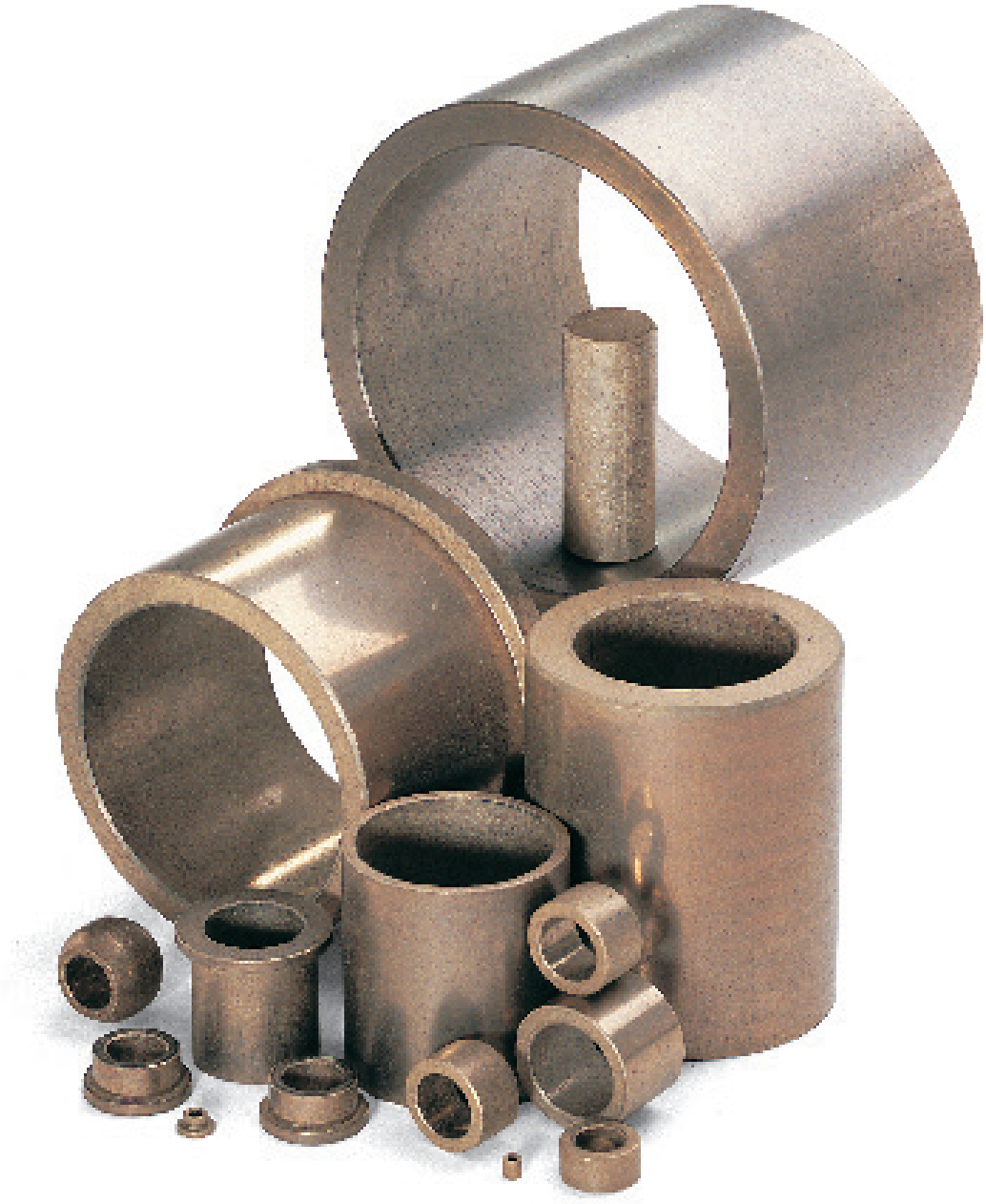
Oil bronze bearings

Self-lubricating sliding bearings



JOHNSON METALL AB

Oil-impregnated bronze bearings

Material: SINT-A51, Leg 630, SS 148321
Oil Bronze Cu 89.5, Sn 9.3, C 1.2. Oil content 29% vol%

Technical instructions

Oil for impregnation

As standard according to ISO VG 68

Minimum working temperature	–12°C
Maximum working temperature	+90°C
Viscosity	3–5°E/50°C
Kinematic viscosity	20–35 cSt

Oil losses - Additive lubrication

During storage and assembly, care must be taken that the bearings do not come into contact with materials that can absorb oil, as the bearings can then lose their oil content very quickly. Leave the bearings in their original packaging for as long as possible.

If it can be suspected that the bearings have lost oil, new oil may be added by dipping the bearings in hot oil (80°C) and letting them cool in the oil.

Additive lubrication is not normally necessary. However, in extreme operating conditions, it can be advantageous and then a thin oil should be used with the same viscosity as the original oil above. The oil should not contain solid additives, as these can clog the pores in the bearing surface.

PV Value – Service life

	Oil bronze	Graphite bronze
PV (N/mm² x m/s) Continuous operation	1.6	0.4
P_{max} (N/mm²) Continuous operation, sliding speed ≈0.2 m/s	10	2.5
P_{max} (N/mm²) Static load calculated on dxL	50	40
V_{max} (m/s). Continuous operation	5	0.25

NB! An adequate lubrication of oil-impregnated bronze bearings requires the sliding speed to be at least 10 m/min (0.2 m/s). The bearings also have their highest loadability then.

In ideal load and speed conditions, room temperature and working lubrication, an oil-impregnated bronze bearing can easily reach a lifespan of more than 50,000 hours. By additive lubrication, this can be further increased.

Friction coefficient

Oil-impregnated bronze	0.05–0.10
Graphite bronze	0.15–0.25

The friction coefficient depends on the shaft's surface finish, sliding speed and temperature.

At low load and high sliding speed, an even lower friction coefficient can be achieved with oil-impregnated bearings.

Special dimensions – Special tolerances

Thanks to a large selection of tools, a number of special dimensions with standard (E7/r7) or special tolerances can also be produced. Tool costs are only partially charged if tools are not available. Small series, especially lengths, can be delivered quickly and affordably.

Length tolerance for thin-walled bearings (t≤2): h14.

Machining

Sintered metal can be machined with hard metal (K20/K01) or diamond tool. Cutting speed 100–150 m/min. The sliding surface of the oil-impregnated bronze bearings should not be polished or sanded as the pores are easily clogged.

Oil losses can be compensated by dipping the bearing in hot (80°C) oil and letting it cool in the oil.

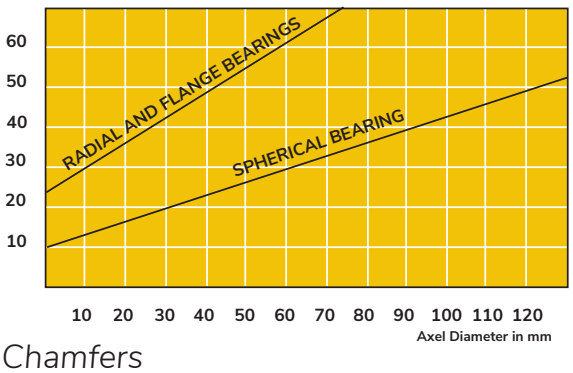
Shafts

Hardened or unhardened, grinded shaft material can be used. The better the surface finish, the better the bearing function, i.e. longer service life. In less stressed bearings, drawn shafts can also be used.

If stainless steel shafts are used, hard chrome plating is recommended for minimum wear.

Shaft tolerance h6–h9 with bushing tolerance E7.

Clearance for oil-impregnated bronze bearings µm

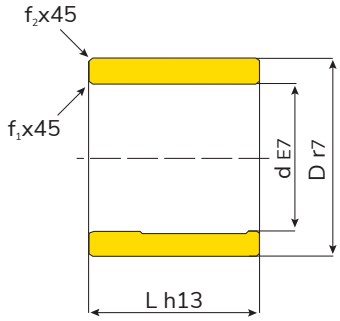


Chamfers

d mm	Chamfer mm f_1	f_2	f_3	Radius R mm	Throw µm radial
–4	0.2	0.2	0.2	0.2	50
(4)–5	0.3	0.3	0.2	0.2	50
(5)–9	0.3	0.3	0.2	0.3	50
(9)–18	0.6	0.6	0.2	0.3	50
(18)–20	1.0	0.6	0.3	0.5	50
(20)–35	1.0	0.6	0.3	0.5	70
(35)–40	1.0	0.6	0.5	0.8	70
(40)–50	1.0	0.6	0.5	0.8	100
(50)–75	1.5	0.6	0.5	0.8	100
(75)–100	2.0	0.8	0.5	0.8	100

Radial bearings

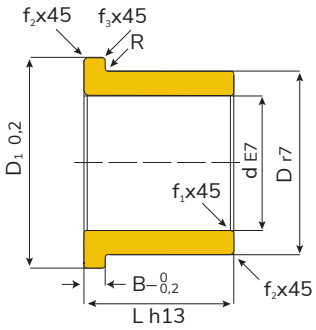
Standard: SS 2991 (ISO 2795)



d mm	D mm	Length series L mm	d mm	D mm	Length series L mm
2	4	4	22	32	20-30
3	8	4	25	30	20-25-30
4	8	4-6-8	25	32	20-25-30-35
4	10	8	25	35	25-35-50
5	10	6-8-10	25	45	35
5	12	10	30	35	20-25-30
6	9	4-6-10	30	38	20-25-30-40
6	10	4-6-10	30	40	30-45-60
6	12	6-8-12	30	50	60
6	14	12	35	41	25-35-40
8	11	6-8-12	35	45	25-35-40-50-70
8	12	6-8-12	40	46	30-40-50
8	14	8-12-16	40	50	30-40-50-60-80
8	18	16	45	51	35-45-55
10	14	8-10-16	45	55	35-45-55-60-65
10	16	8-10-16-20	45	65	80
10	22	20	50	60	35-50-70-100
12	16	8-12-20	50	70	70
12	18	8-12-16-20-25	55	65	40-55-70
12	25	25	55	70	70
14	18	10-14-20	60	68	50-60-70
14	20	10-12-14-20-30	60	70	50-60
14	28	30	60	72	50-60-70
15	19	10-15-25	60	75	60-90
15	20	10-15-20-25-30	60	85	90
15	21	10-15-25	65	75	60-90
15	22	16-20-30	65	80	60-90
15	30	30	70	80	60-90
16	20	12-16-25	70	85	60-90
16	22	12-16-20-25-30	75	85	70-100
16	32	30	75	90	70-100
18	22	12-18-30	75	100	100
18	24	12-18-30	80	90	70-100
18	25	16-20-30	80	95	70-100
18	35	30	80	105	100
20	25	15-20-25	85	95	100
20	26	15-20-25-30	85	100	100
20	28	20-30-40	90	105	80
20	40	40	90	110	80
22	27	15-20-25	100	120	80

Flange bearings

Standard: SS 2992 (ISO 2795)

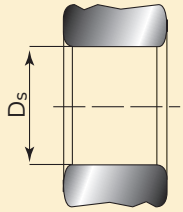
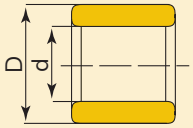
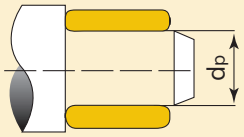
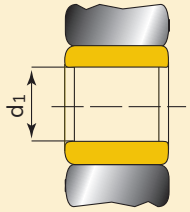
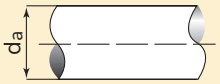


d mm	D mm	Length series L mm	D1 mm	B mm
3	5	4	8	1.5
3	6	4	9	1.5
4	8	6	10	1.5
4	8	4-6	12	2
5	9	4-5-8	13	2
5	10	6	12	2
6	10	4-6-10	14	2
6	12	6	14	2
8	12	6-8-12	16	2
8	14	8	18	3
10	16	8-10	20	3
10	16	8-10-16	22	3
12	18	10-12	22	3
12	18	8-12-20	24	3
14	20	10-12	25	3
14	20	10-14-20	26	3
15	20	15-25	27	3
15	21	10-15-25	27	3
15	22	12-16	28	3
16	22	12-16-25	28	3
16	22	12-16	28	4
18	24	12-18-30	30	3
18	25	12-16	32	4
20	26	15-20-25-30	32	3
20	28	16-20	35	4
25	32	20-25-30	39	3.5
25	35	16-25	45	5
30	38	20-25-30	46	4
30	40	20-30	50	5
35	45	20-25-35-40	55	5
40	50	30-40-50	60	5
40	50	25-40	60	6
45	55	35-45-55	65	5
45	55	30-45	65	6
50	60	35-50	70	5
50	60	30-50	70	6
60	72	50-60	84	6
60	75	35-60	85	8
70	85	60	95	8
80	95	70	105	8
90	110	50	120	8
100	120	80	130	8

Solid round oil bronze blanks

D mm	L mm
20	52
30	52
40	52
50	60
60	60
80	80

Guidelines for assembly

Bearing housing D_s	Manufacturing tolerance d/D	The bearings are assembled by pressing in. Use mandrel d_p		Tolerance of shaft diameter d_a
		with tolerance	Tolerance of d_1 after fitting	
H7	E7/r7	s5	F7	h8/h9
				

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Johnson Metall has great experience in casting, metallurgy, tribology and cutting machining –

experience that together with modern machinery provides us with efficient manufacture and unique opportunities n collaboration with our customers.

We are the Nordic countries' biggest manufacturer of sliding bearings, hollow bars and mould components made of bronze.

JOHNSON METALL AB

We are the Nordic countries' leading manufacturer of cast and machined bronze products for industrial applications. We offer a comprehensive range of everything from standard stocked products to custom-manufactured components. Our vision is to always be your obvious choice as a supplier.

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