SOBF
Flanged bushes

Stepping foreard together with our customers

For more than 50 years, ***SANKYO OILLESS*** has been one of the leading manufacturers of maintenance-free sliding elements. As a leading supplier and pioneer in the production of stamping and press tool components for the automotive industry, ***SANKYO OILLESS*** supplies an products for many other applications such as mold making, engineering, packaging, heavy industry, aerospace and many more.

The technologies developed by ***SANKYO OILLESS*** have reduced or eliminated friction, wear and tear. In addition, ***SANKYO OILLESS*** provides services and quality products to offer you the best possible solutions for your requirements at all times.

The benefits of slide bearings versus roller bearings

In a variety of applications, designers are increasingly replacing roller bearings with slide bearings. In addition to ease of installation and cost effectiveness, slide bearings offer a number of distinct advantages. Slide bearings require less installation space, have a larger load bearing capacity, are maintenance-free or require little maintenance, are easier to assemble and are less susceptible to noise and vibration.

The following list gives an overview of the general advantages of bearings compared to bearings.

Slide bearing

- Higher load bearing capacity and reduced footperint
- Higher resistance to vibration and increased lifetime
- Easier installation
- Lower installation costs
- Increased shaft tolerances possible
- Compensates misalignment and reduces the edge load

Roller bearing

- sensitive to shock, vibration and edge load
- high costs for bearings, housings, counterfaces and - fixing materials
- large space required
- is prone to noise development

Technologies for top performance

SANKYO products are manufactured in our own plants and distributed worldwide.

We offer high quality maintenance-free sliding elements acc. to international standards and standards for use in

- pressing tools
- injection molds
- general engineering

As an experienced specialist, we have the appropriate know-how in tribology to always offer the best solutions for your needs. We supply a large portfolio of lubrication-free sliding elements and also offer custom products acc. to customer drawing.

Quality and performance are our constant commitment!

Bushings with graphite

For a good distribution of the solid lubricant between the sliding element and the sliding partner, a small sliding gap is needed. This happens once by abrasion and by swelling from the depots in the micrometer range. As a result, pairing with clearance „0“ is not possible using our bronze lubricants with solid lubricant, which would inevitably result in jamming.

Bronze bushings with for example type SOB, narrows in the bore after insertion of the tolerance range F7 to a tolerance range H7. Prerequisites for this are:

- H7 *(the tolerance of the housing bore)*
- a corresponding wall thickness of the housing
- the control of the best wall strength of the socket
-

From the experience of the most diverse use cases, the following tolerance fields should be used when against run partner preferred:

- h6 *(for the highest precision in cutting tool / mold construction)*
- f7, e7 *(for highest accuracy in general engineering)*
- d8, e8 *(for highest accuracy in general engineering)*
- e8 + D9 *(for highest accuracy in general engineering)*

Attention

The graphite cannot be deposited on the entire surface with very small movements. Please contact the technical department if you want to realise very small movements.

Sliding partners

Suitable sliding partners for Sankyo Oilless Bushes and Plates are **gas nitrated or hardened steel** alloys with **HRC > 35**.

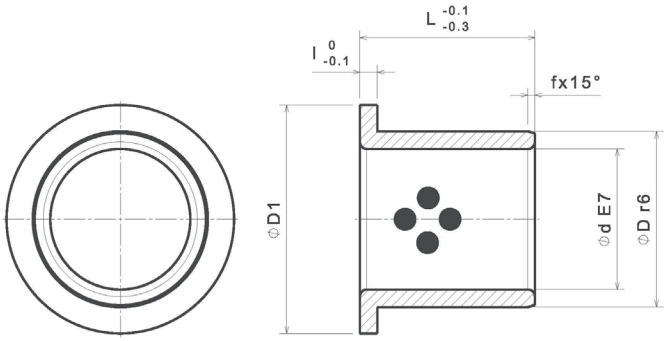
In order to ensure an optimal sliding beahaviour, the difference in hardeness between the sliding material and sliding partner should at least be **100 HB**.

The surface roughness of the sliding partner should be **Rz = 3...6,3 µm (grinding)**.

If guides, like in large dies of punching tools, are continuously moved apart during operation, the counterpart partner should be provided with correspondingly generous centering chamfers.

SOBF - Flanged bushes

Article informationen



Properties:

Base material	Special brass (SO#50SP2)
Self-lubricating	Yes
Lubricant	Graphite
Max. surface pressure P	100 N/mm²
Max. sliding speed v	30 m/min
Max. P*v-Wert	200 N/mm² x m/min
Operating temperature	-50°C / +200°C (max. 300°C)
Friction coefficient	0,07

Article no.:	Article name:	Inner Ø d:	Outer Ø D:	Length L:	D1 :	l:	f:
118008010	SOBF 8-12-10	8	12	10	20	2	0,5
118008012	SOBF 8-12-12			12			
118008015	SOBF 8-12-15			15			1
118010010	SOBF 10-14-10	10	14	10	22		
118010012	SOBF 10-14-12			12			
118010015	SOBF 10-14-15			15			
118010017	SOBF 10-14-17			17			
118010020	SOBF 10-14-20			20			
118012010	SOBF 12-18-10	12	18	10	25	3	
118012012	SOBF 12-18-12			12			
118012015	SOBF 12-18-15			15			
118012020	SOBF 12-18-20			20			
118012025	SOBF 12-18-25			25			
118012030	SOBF 12-18-30			30			
118013010	SOBF 13-19-10	13	19	10	26		
118013012	SOBF 13-19-12			12			
118013015	SOBF 13-19-15			15			
118013020	SOBF 13-19-20			20			
118013025	SOBF 13-19-25			25			
118013030	SOBF 13-19-30			30			
118014015	SOBF 14-20-15	14	20	15	27		
118014020	SOBF 14-20-20			20			
118014025	SOBF 14-20-25			25			
118015010	SOBF 15-21-10	15	21	10	28		
118015012	SOBF 15-21-12			12			
118015015	SOBF 15-21-15			15			
118015020	SOBF 15-21-20			20			
118015025	SOBF 15-21-25			25			
118015030	SOBF 15-21-30			30			
118016012	SOBF 16-22-12	16	22	12	29		
118016015	SOBF 16-22-15			15			
118016018	SOBF 16-22-18			18			
118016020	SOBF 16-22-20			20			
118016023	SOBF 16-22-23			23			
118016025	SOBF 16-22-25			25			
118016030	SOBF 16-22-30			30			
118016035	SOBF 16-22-35			35			
118016040	SOBF 16-22-40			40			

Article no.:	Article name:	Inner Ø d:	Outer Ø D:	Length L:	D1 :	l:	f:
118018015	SOBF 18-24-15	18	24	15	32	3	1
118018020	SOBF 18-24-20			20			
118018025	SOBF 18-24-25			25			
118018030	SOBF 18-24-30			30			
118018035	SOBF 18-24-35			35			
118018040	SOBF 18-24-40			40			
118020015	SOBF 20-30-15	20	30	15	40	5	
118020020	SOBF 20-30-20			20			
118020025	SOBF 20-30-25			25			
118020030	SOBF 20-30-30			30			
118020035	SOBF 20-30-35			35			
118020040	SOBF 20-30-40			40			
118025015	SOBF 25-35-15	25	35	15	45		2
118025020	SOBF 25-35-20			20			
118025025	SOBF 25-35-25			25			
118025030	SOBF 25-35-30			30			
118025035	SOBF 25-35-35			35			
118025040	SOBF 25-35-40			40			
118025050	SOBF 25-35-50			50			
118030020	SOBF 30-40-20	30	40	20	50		
118030025	SOBF 30-40-25			25			
118030030	SOBF 30-40-30			30			
118030035	SOBF 30-40-35			35			
118030040	SOBF 30-40-40			40			
118030050	SOBF 30-40-50			50			
118031020	SOBF 31,5-40-20	31,5		20			
118031030	SOBF 31,5-40-30			30			
118031035	SOBF 31,5-40-35			35			
118031040	SOBF 31,5-40-40			40			
118035020	SOBF 35-45-20	35	45	20	60		
118035025	SOBF 35-45-25			25			
118035030	SOBF 35-45-30			30			
118035035	SOBF 35-45-35			35			
118035040	SOBF 35-45-40			40			
118035050	SOBF 35-45-50			50			
118040020	SOBF 40-50-20	40	50	20	65		
118040025	SOBF 40-50-25			25			
118040030	SOBF 40-50-30			30			
118040035	SOBF 40-50-35			35			
118040040	SOBF 40-50-40			40			
118040050	SOBF 40-50-50			50			
118045030	SOBF 45-55-30	45	55	30	70		
118045035	SOBF 45-55-35			35			
118045040	SOBF 45-55-40			40			
118045050	SOBF 45-55-50			50			
118045060	SOBF 45-55-60			60			
118050030	SOBF 50-60-30	50	60	30	75		
118050035	SOBF 50-60-35			35			
118050040	SOBF 50-60-40			40			
118050050	SOBF 50-60-50			50			

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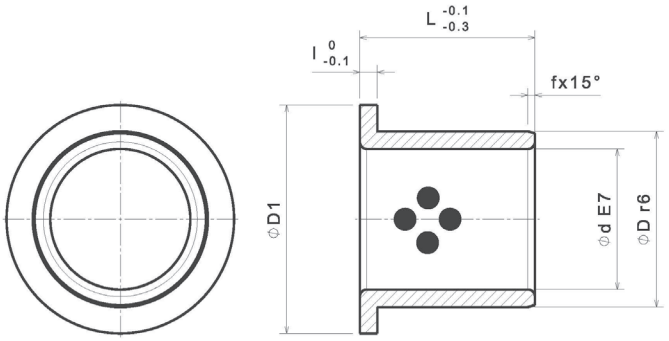

Properties:

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Max. P*v-Wert	200 N/mm² x m/min
Operating temperature	-50°C / +200°C (max. 300°C)
Friction coefficient	0,07

Article no.:	Article name:	Inner Ø d:	Outer Ø D:	Length L:	D1 :	l:	f:
118050060	SOBF 50-60-60	50	60	60	75	5	2
118055040	SOBF 55-65-40	55	65	40	80		
118055060	SOBF 55-65-60			60			
118060040	SOBF 60-75-40	60	75	40	90	7,5	3
118060050	SOBF 60-75-50			50			
118060080	SOBF 60-75-80			80			
118063067	SOBF 63-75-67,5	63		67,5	85		
118065060	SOBF 65-80-60	65	80	60	95		
118070050	SOBF 70-85-50	70	85	50	105		
118070080	SOBF 70-85-80			80			
118075060	SOBF 75-90-60	75	90	60	110		
118080060	SOBF 80-100-60	80	100	60	120	10	
118080080	SOBF 80-100-80			80			
118080100	SOBF 80-100-100			100			
118090060	SOBF 90-110-60	90	110	60	130		
118090080	SOBF 90-110-80			80			
118100080	SOBF 100-120-80	100	120	80	150		
118100100	SOBF 100-120-100			100			
118120080	SOBF 120-140-80	120	140	80	170		
118120100	SOBF 120-140-100			100			
118130080	SOBF 130-150-80	130	150	80	180		
118130100	SOBF 130-150-100			100			
118140080	SOBF 140-160-80	140	160	80	190		
118140100	SOBF 140-160-100			100			
118150100	SOBF 150-170-100	150	170	100	200		
118150120	SOBF 150-170-120			120			
118160100	SOBF 160-180-100	160	180	100	210		
118160120	SOBF 160-180-120			120			

Finishing

SANKYO OILLESS - bronze is easy to machine. Basically, there is no great difference between the machining of our products and normal steel. No special tools are required but be sure to use sharp and preferably new tools.

Milling

The use of cooling lubricants is recommended by using HSS or carbide tools. First pre-roughing to approx. distance of 0,3mm to nominal. In general: Milling / rough machining with little effort, slow forward feed, at high rotation-speeds and small depths of cut.

Drilling

The use of cooling lubricants is recommended by using HSS or carbide tools. Drill as with normal steel and if it´s necessary increase the forward feed with same rotation-speed. Flat plates have to be drilled from backside and countersink on the sliding surface if it´s necessary to drill through a solid-lubricant depot.

Grinding

The use of cooling lubricants is recommended by working with grinding wheels.

Grain size	46 - 60
Material	Silicon carbid
Rotation speed	1500 U/min
Working speed	30 m/min

Reaming

The use of cooling lubricants is recommended by using HSS reamers. Proceed as with normal steel and if it´s necessary increase the forward feed with same rotation-speed.

Turning

Example (up to 100mm)	External turning	Internal turning
Rotation speed	approx. 1000 U/min	approx. 500 U/min
Feed rate	ca. 0,1 m/min	approx. 0,07 m/min
Tool	Carbide	Carbide

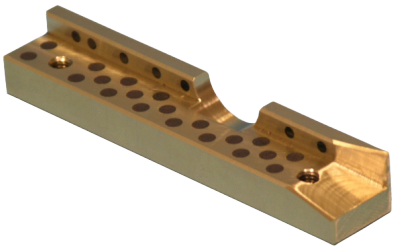
Custom-made products

Beside to the big variety of standard products, we offer custom-made rotation- and milled-parts. We are producing these products out of steel or with our special Sankyo bronze with solid lubrication. Also, it is possible to get standard products with modifications. We only need your drawing or 3D-model with the assembly situation, like load cases and operating conditions, to prove the feasibility.

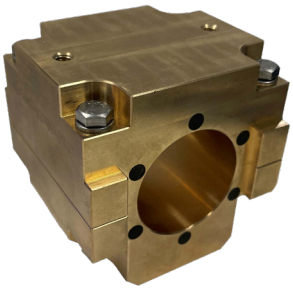
Our expert team will gladly advise you, also at your side. You can contact the department „Engineering“ by:

Tel.: +49 2103 584 800
E-Mail: technik@de.sankyo-oilless.com

Examples



Custom-made products



Prefabricated devidable bush set to add a thread at the customer‘s site

Special design of a special spindle nut

Large bushings for all applications

Material data

Material		SO#50SP2*	SO#50SP5	SO#50SP7	SO#50SP8	SO#50SP13	SO#50B
		Hard brass with graphite	*Alu-bronze with graphite*	*Alu-bronze with graphite*	*Hard brass with graphite*	*Bronze with graphite*	*Red brass with graphite*
Self-lubricating		Yes	Yes	Yes	Yes	Yes	Yes
Lubricant		Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
Max. surface pressure *[N/mm²]*		100	100	120	130	120	50
Max. sliding speed *[m/min]*		30	10	10	15	10	50
Max. P*v-Wert *[N/mm² * m/min]*		200	150	200	200	200	100
Temperature *[°C]*	*Standard* *Max*	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +400
Friction coefficient**	*initial* *long term*	0,15 0,07	0,15 0,07	0,15 0,07	0,15 0,07	0,2 0,15	0,15 0,07
Brinell hardeness *[HB]*		>210	>210	>260	220 ~ 260	>280	>60
Further informatio							
Elongation *[%]*		>12	>18	>2	>3	>0,5	>15
Density *[kg/dm³]*		7,9	7,7	7,8	7,8	7,2	8,7
Tensile strength *[N/mm²]*		>755	>686	>833	>700	>550	>195
Yield strength *[N/mm²]*		>412	>372	>509	-	-	>105
E-Module *[N/mm²]*		97000	108000	123600	108000	145000	96000
Thermal expansion *[10-5 * grd.-1]*		1,9	1,6	1,6	1,9	1,71	1,8

: Material used according to **SANKYO OILLESS standards*

***: against steel, hardened and grinded*

Tin bronze	Sinter-bronze	SO#50PB	CuSn8	SO#50S45C	SO#50F	Polyacetal
		Ton bronze	*acc. to DIN 17662*	*Steel with graphite*	*Grey cast iron with graphite*	*Plastic*
No	Yes	No	No	Yes	Yes	No
-	Oil	-	-	Graphite	Graphite	Graphite
80	50	80	40	30	5	25 35 (with oil)
20	300	50	120	10	10	50 200 (with oil)
-	96	100	-	80	50	100 200 (with oil)
-50 / +200 +300	-12 / +90	-50 / +200 +300	-200 / +200	-50 / +150	-50 / +150	-50 / +80
0,16	0,09	0,15 0,07	-	0,01	-	-
>80	>25	>80	-	>375	160 ~ 220	115 (HRR)
n						
>6	-	>5	-	19	-	73
8,7	6,5 ~ 7,0	8,2	8,8	7,8	7,1 ~ 7,3	1,4
>295	-	>295	-	>690	>250	69
>161	-	>161	-	-	-	-
108000	-	108000	115000	-	-	-
1,8	-	1,8	-	1,1	1	7,7

Chemical resistance

Water

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AlB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	*Red brass mit FSS*
Fresh Water	O	◎	◎	X	◎	O
Sea Water	△	O	O	X	◎	O

Acid

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AlB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	
Alcohol	◎	◎	◎	-	◎	-
Formic acid	-	-	-	-	-	X
Chlorine (dry)	◎	◎	◎	-	◎	-
Chlorine (wet)	X	△	△	-	-	-
Chromic acid	X	X	X	X	-	-
Acetic acid	X	X	◎ (20°C) △ (118°C)	X	◎	O
Hydrochloric acid	-	O	O	X	-	X
Concentrated hydrochloric acid	X	X	△	X	X	-
Lactic acid	X	X	X	X	O	X
Phenol	-	-	-	-	-	X
Phosporic acid	X	O	O	X	△	X
Nitric acid	X	X	X	X	O	-
Sulfuric acid (40-80%)	X	△	△	X	△	X* △**
Sulfuric acid (80-95%)	X	O	O	X	△	X* △**
Diluted hydrocloric acid	△	-	-	-	-	X
Hydrogen peroxide	△	O	O	X	O	-

**: High concentration*

***: Low concentration*

Explanation		
◎: Preferred	O: no problem in use	△: Affected
X: Not allowed for use	-: unknown	

Chemical resistance

Alkali

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AIB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	
Ammonia (dry)	◎	◎	◎	O	◎ (20°C) X (Gas)	X
Ammonia (wet)	X	X	X	O	◎ (20°C) X (Gas)	X
Ammonia (liquid)	X	X	X	-	◎	X
Iron chloride	X	O	O	X	△	-
Potassium hydroxide	O	O	O	-	-	-
Calcium chloride	X	O	O	△	O	-
Calcium hydroxide	O	◎	◎	O	-	O
Sodium hydroxide	O	O	O	-	◎	-
Sulfur (dry)	◎	O	O	△	-	O
Sulfur (wet)	X	X	X	△	-	O

Solvent

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AIB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	
Acetone	◎	◎	◎	O	◎	△
Benzene	-	-	-	-	-	△
Ethylene glycol	O	◎	◎	△	-	-
Carbon tetrachloride (dry)	◎	◎	◎	X	◎	-
Carbon tetrachloride (wet)	X	O	O	X	-	-
Methyl alcohol	◎	◎	◎	O	O	△
Toluene	◎	◎	◎	O	-	-

Explanation		
◎: Preferred	O: no problem in use	△: Affected
X: Not allowed for use	-: unknown	

Chemical resistance

Grease and others

Material	SO#50SP2 SO#50SP8	SO#50B	SO#50SP5 SO#50SP7 SO#50SP13 SO#50AlB	SO#50F	SO#50S45C	Polyacetal
	High strength brass casting	*Red brass*	*Alu-bronze*	*Grey cast*	*Steel*	
Gasoline	◎	◎	◎	O	◎	O
Diesel	-	-	-	-	-	O
Crude oil	△	O	O	O	O	-
Lacquer	◎	◎	◎	△	-	-
Kerosene	◎	◎	◎	O	◎	-
Vegetable oil	◎	◎	◎	△	-	-
Lubricants	◎	◎	◎	◎	◎	O
Heavy oil	O	◎	◎	O	O	-
Animal oil	◎	◎	◎	-	-	-

Explanation		
◎: Preferred	O: no problem in use	△: Affected
X: Not allowed for use	-: unknown	

Maintenance and lubrication

Before inserting the sliding elements, clear the mounting surfaces of the housing. An oil film on the back surface will make it easier to mount the bearing. Before mounting the axle, lubricate the sliding surfaces with a light greasy film to avoid wear of the inlet and to activate the solid lubricant.

The following greases should be preferred:

ELKALUB GLS 364	ELKALUB	120°C	For the food industry
ELKALUB GLS 595/N2	ELKALUB	300°C	For the food industry
ELKALUB GLS 993 H1	ELKALUB	150°C	For the food industry
GLEITMO 805	FUCHS	110°C	
ALTEMP QNB 50	KLÜBER	150°C	
Klüberalfa DH 3-350	KLÜBER	230°C	
Klüberfood NH1 CH 2-150	KLÜBER	250°C	For the food & pharmaceutical industry
Klübertemp GR AR 555	KLÜBER	250°C	
PARALIQ P 68	KLÜBER	100°C	For the food & pharmaceutical industry
Gadus S2 V100 2	SHELL	130°C	
Gadus S3 V100 2	SHELL	160°C	
Multi-purpose grease Nr.12511	PRESSOL	80°C	

The greases have to be free of Additives like MoS2 (molybdenum disulfide) and EP.

The work to be carried out is usually limited to an inspection of the wear in the period from ½ to 2 years, depending on the duration of use and load. After each disassembly, a single re-greasing should be carried out, but the sintered sliding film of solid lubricant should not be removed. Continuous introduction of lubricant is not necessary, as the parts are maintenance-free under consideration of the application criteria for sliding elements made of bronze with solid lubricant.

Transport and storage

The parts are to be stored dust-free and dry, mechanical damages during transport and storage are to be avoidded. Contact with organic and inorganic solvents must also be prevented, as this may destroy the solid lubricant.