



VDIP-BS & VDIP-S

Slide plates acc. to VDI 3357

Stepping forward 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 footprint
- 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!

Plates, angle strips and the like

According to the case of application and the desired accuracy, between 0.02 and 0.15 mm.

In general, guide slides are made to give a clearance of 0.05 mm and a vertical clearance of 0.1 mm.

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 behaviour, the difference in hardness between the sliding material and sliding partner should at least be **100 HB**.

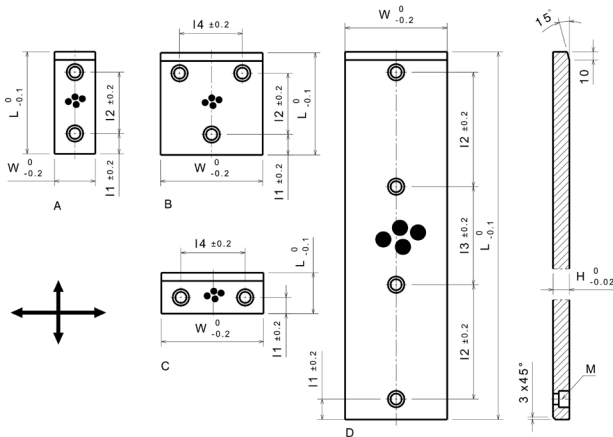
The surface roughness of the sliding partner should be **Rz = 3...6,3 µm (grinding)**.

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.

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Article informationen



Properties:

Base material	Special brass (SO#50SP2)
Self-lubricating	Yes
Lubricant	Graphite
Max. surface pressure P	100 N/mm ²
Max. sliding speed v	30 m/min
Max. P*v-Wert	200 N/mm ² x m/min
Operating temperature	-50°C / +150°C (max. 300°C)
Friction coefficient	0,07

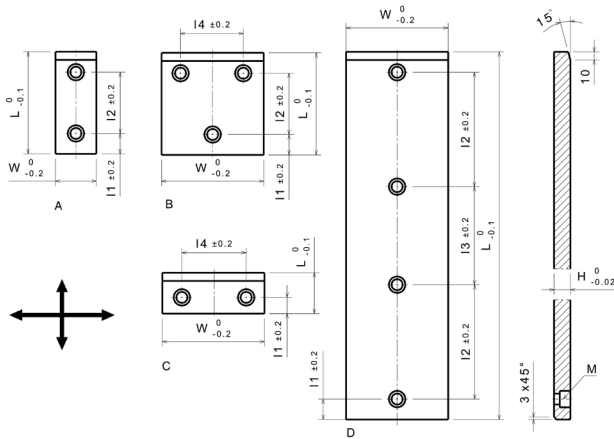
Article no.:	Article name:	Width W:	Length L:	Height H:	I1:	I2:	I3:	I4:	M (ISO 4762):	Form:
2186312	VDIP-BS 50-80	50	80	20	25	30	-	-	M8	A
2186313	VDIP-BS 50-100		100			50			M12	
2186314	VDIP-BS 50-125		125			75				
2186315	VDIP-BS 50-160		160			110				
2186316	VDIP-BS 50-200		200			150				
218630111	VDIP-BS 50-250		250			60	80			D
218630112	VDIP-BS 50-300		300			80	90			
218630113	VDIP-BS 50-350		350			100	100			
218630114	VDIP-BS 50-400		400			120	110			
218630115	VDIP-BS 50-450		450			140	120			
218630116	VDIP-BS 50-500		500			150	150			
2186321	VDIP-BS 80-50	80	50		25	0	-	30	M8	C
2186322	VDIP-BS 80-80		80			30		M12	A	
2186323	VDIP-BS 80-100		100			50				
2186324	VDIP-BS 80-125		125			75				
2186325	VDIP-BS 80-160		160			110				
2186326	VDIP-BS 80-200		200			150				
218630121	VDIP-BS 80-250		250			60	80		D	
218630122	VDIP-BS 80-300		300			80	90			
218630123	VDIP-BS 80-350		350			100	100			
218630124	VDIP-BS 80-400		400			120	110			
218630125	VDIP-BS 80-450		450			140	120			
218630126	VDIP-BS 80-500	500	150		150					
2186331	VDIP-BS 100-50	100	50		40	-	-	50	M12	C
2186332	VDIP-BS 100-80		80			A				
2186333	VDIP-BS 100-100		100					50		
2186334	VDIP-BS 100-125		125					75		
2186335	VDIP-BS 100-160		160					110		D
2186336	VDIP-BS 100-200		200			150				
218630131	VDIP-BS 100-450		450			140	120			
218630132	VDIP-BS 100-500		500			150	150			
2186341	VDIP-BS 125-50	125	50		25	-	-	75		C
2186342	VDIP-BS 125-80		80			B				
2186343	VDIP-BS 125-100		100							50
2186344	VDIP-BS 125-125		125							75
2186345	VDIP-BS 125-160		160							110
2186346	VDIP-BS 125-200		200			150				
218630141	VDIP-BS 125-450		450			140	120			-

Article no.:	Article name:	Width W:	Length L:	Height H:	I1:	I2:	I3:	I4:	M (ISO 4762):	Form:			
218630142	VDIP-BS 125-500	125	500	20	25	150	150	-	M12	D			
2186351	VDIP-BS 160-50	160	50			40	-	-		110	C		
2186352	VDIP-BS 160-80		80		B								
2186353	VDIP-BS 160-100		100			25	50				-	-	D
2186354	VDIP-BS 160-125		125				75						
2186355	VDIP-BS 160-160		160				110						
2186356	VDIP-BS 160-200		200				150						
218630150	VDIP-BS 100-250	100	250		25	60	80	-		D			
218630151	VDIP-BS 100-300		300			80	90						
218630155	VDIP-BS 125-250	125	250			60	80						
218630156	VDIP-BS 125-300		300			80	90						
218630157	VDIP-BS 125-350		350			100	100						
218630160	VDIP-BS 160-250	160	250			60	80						
218630161	VDIP-BS 160-300		300			80	90						
218630162	VDIP-BS 160-350		350			100	100						

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Article informationen



Artikeleigenschaften:

Base material	Steel, hardened
Self-lubricating	No

Article no.:	Article name:	Width W:	Length L:	Height H:	I1:	I2:	I3:	I4:	M (ISO 4762):	Form:
2186412	VDIP-S 50-80	50	80	20	25	30	-	-	M8	A
2186413	VDIP-S 50-100		100			50			M12	
2186414	VDIP-S 50-125		125			75				
2186415	VDIP-S 50-160		160			110				
2186416	VDIP-S 50-200		200			150				
2186421	VDIP-S 80-50	80	50			-		30	M8	C
2186422	VDIP-S 80-80		80			30		-	M12	A
2186423	VDIP-S 80-100		100			50				
2186424	VDIP-S 80-125		125			75				
2186425	VDIP-S 80-160		160			110				
2186426	VDIP-S 80-200		200			150				
2186431	VDIP-S 100-50	100	50			-		50		C
2186432	VDIP-S 100-80		80			40		-		A
2186433	VDIP-S 100-100		100			50				
2186434	VDIP-S 100-125		125			75				
2186435	VDIP-S 100-160		160		110					
2186436	VDIP-S 100-200		200		150					
2186441	VDIP-S 125-50	125	50		-	75		C		
2186442	VDIP-S 125-80		80		40			B		
2186443	VDIP-S 125-100		100		50					
2186444	VDIP-S 125-125		125		75					
2186445	VDIP-S 125-160		160		110					
2186446	VDIP-S 125-200		200		150					
2186451	VDIP-S 160-50	160	50		-	110		C		
2186452	VDIP-S 160-80		80		40			B		
2186453	VDIP-S 160-100		100		50					
2186454	VDIP-S 160-125		125		75					
2186455	VDIP-S 160-160		160		110					
2186456	VDIP-S 160-200		200		150					

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:

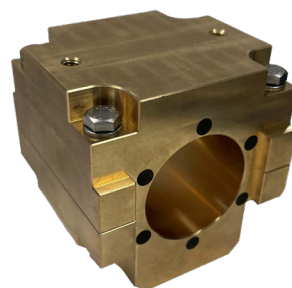
Tel.: [+49 2103 584 800](tel:+492103584800)

E-Mail: technik@de.sankyo-oilless.com

Examples



Custom-made products



Prefabricated deidable bush set to add a thread at the customer's site



Special design of a special spindle nut



Large bushings for all applications

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General and technical information

Material data

Material		SO#50SP2*	SO#50SP5	SO#50SP7	SO#50SP8	SO#50SP13	SO#50B
		<i>Hard brass with graphite</i>	<i>Alu-bronze with graphite</i>	<i>Alu-bronze with graphite</i>	<i>Hard brass with graphite</i>	<i>Bronze with graphite</i>	<i>Red brass with graphite</i>
Self-lubricating		Yes	Yes	Yes	Yes	Yes	Yes
Lubricant		Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
Max. surface pressure [N/mm ²]		100	100	120	130	120	50
Max. sliding speed [m/min]		30	10	10	15	10	50
Max. P*v-Wert [N/mm ² * m/min]		200	150	200	200	200	100
Temperature [°C]	<i>Standard Max</i>	-50 / +150 +300	-50 / +150 +300	-50 / +150 +300	-50 / +150 +300	-50 / +150 +300	-50 / +150 +400
Friction coefficient**	<i>initial long term</i>	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 hardness [HB]		>210	>210	>260	220 ~ 260	>280	>60
Further information							
Elongation [%]		>12	>18	>2	>3	>0,5	>15
Density [kg/dm ³]		7,9	7,7	7,8	7,8	7,2	8,7
Tensile strength [N/mm ²]		>755	>686	>833	>700	>550	>195
Yield strength [N/mm ²]		>412	>372	>509	-	-	>105
E-Module [N/mm ²]		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
		<i>Ton bronze</i>	<i>acc. to DIN 17662</i>	<i>Steel with graphite</i>	<i>Grey cast iron with graphite</i>	<i>Plastic</i>
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	-12 / +90	-50 / +150 +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#50AIB	SO#50F	SO#50S45C	Polyacetal
	<i>High strength brass casting</i>	<i>Red brass</i>	<i>Alu-bronze</i>	<i>Grey cast</i>	<i>Steel</i>	<i>Red brass mit FSS</i>
Fresh Water	○	◎	◎	X	◎	○
Sea Water	△	○	○	X	◎	○

Acid

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

*: High concentration

**: Low concentration

Explanation		
◎: Preferred	○: 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
	<i>High strength brass casting</i>	<i>Red brass</i>	<i>Alu-bronze</i>	<i>Grey cast</i>	<i>Steel</i>	
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
	<i>High strength brass casting</i>	<i>Red brass</i>	<i>Alu-bronze</i>	<i>Grey cast</i>	<i>Steel</i>	
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#50AIB	SO#50F	SO#50S45C	Polyacetal
	<i>High strength brass casting</i>	<i>Red brass</i>	<i>Alu-bronze</i>	<i>Grey cast</i>	<i>Steel</i>	
Gasoline	◎	◎	◎	○	◎	○
Diesel	-	-	-	-	-	○
Crude oil	△	○	○	○	○	-
Lacquer	◎	◎	◎	△	-	-
Kerosene	◎	◎	◎	○	◎	-
Vegetable oil	◎	◎	◎	△	-	-
Lubricants	◎	◎	◎	◎	◎	○
Heavy oil	○	◎	◎	○	○	-
Animal oil	◎	◎	◎	-	-	-

Explanation		
◎: Preferred	○: 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 avoided. Contact with organic and inorganic solvents must also be prevented, as this may destroy the solid lubricant.

