



## **KOCU-K**

### **Inclined ejector units**

### 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!

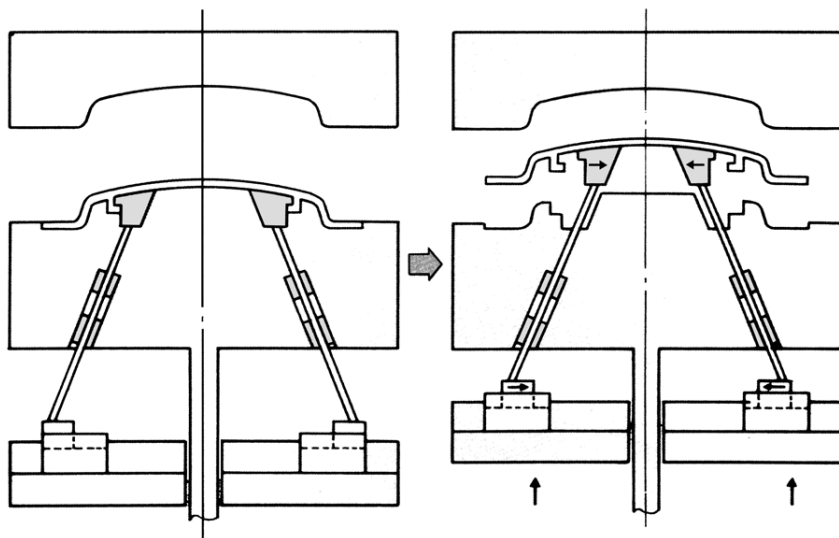
## KOCU-Ejector core unit

Maintenance-free inclined core units for easy removing of moldings with undercuts.

All inclined ejector core units are self-lubricating till 300°C. The shaft is fixed with screws and dowel pins or clamping between ejector plates.

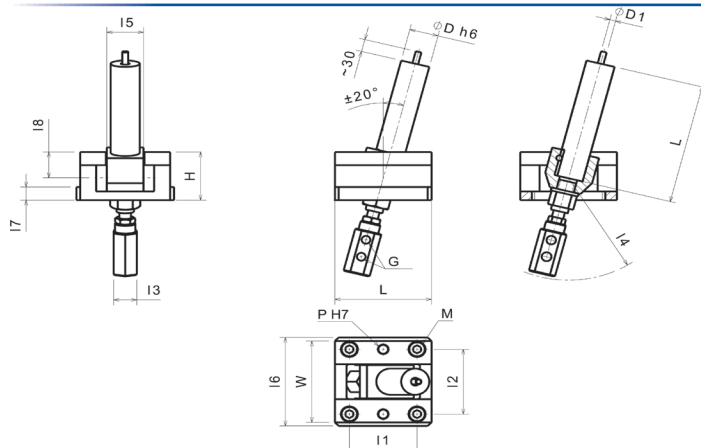
					
Model	KOCU-S	KOCU-K	KOCU-KE	KOCU-F	KOCU-M
Diameter	Ø8 - Ø45mm	Ø12 - Ø45mm	Ø16 - Ø30mm	Ø8 - Ø40mm	Ø16 - Ø40mm
Working angle	max. 30°	max. 20°	max. 30°	max. 30°	max. 30°
Feature	Variant with double width	with twin wall pin for directing cooling of the slide core	cooling water connections inside the mould	inclined slideway (0° - 20°)	inclined slideway (0° - 20°) with adjustment screw

## Application example



# KOCU-K - Inclined ejector units

## Article informationen

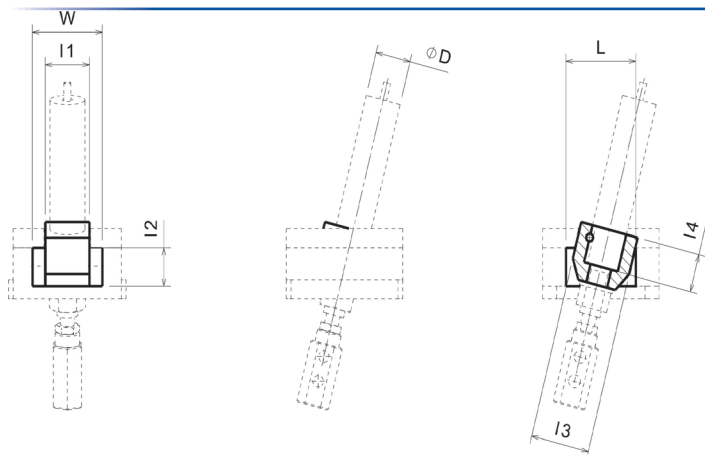


### Properties:

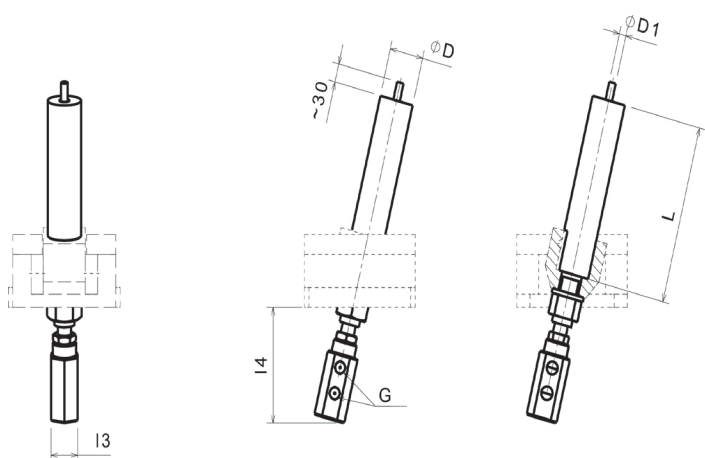
Base material	Special brass (SO#50SP2)
Self-lubricating	Yes
Lubricant	Graphite

Article no.:	Article name:	Bolt Ø D:	Stroke:	Bolt length L:	Width W:	Height H:	Length L:
26006012N450	KOCU-K 12-450	12	17	450	51	32	50
26006016N450	KOCU-K 16-450	16	23		950	58	36
26006016N950	KOCU-K 16-950						
26006020N440	KOCU-K 20-440	20	28	440	72	42	80
26006020N940	KOCU-K 20-940			940			
26006025N435	KOCU-K 25-435	25	31	435	85	50	90
26006025N935	KOCU-K 25-935			935			
26006030N935	KOCU-K 30-935	30	40			93	55
26006035N1000	KOCU-K 35-905	35	45	905	110	62	120
26006040N1000	KOCU-K 40-905	40	50		120	70	135
26006045N1000	KOCU-K 45-905	45	55		130	80	150

Article name:	D1:	I1:	I2:	I3:	I4:	I5:	I6:	I7:	I8:	G:	M (ISO 4762):	P (ISO 8734):
KOCU-K 12	4	35	39	19	63	17	57	7	18	M10x1	4xM6	2xø6
KOCU-K 16	6	40	46	24	74	22	65	8	20		4xM8	2xø8
KOCU-K 20		55	56			26	80	11	23		4xM10	2xø10
KOCU-K 25		65	66			32	93	15	28		4xM12	2xø10
KOCU-K 30		70	74			38	101		30			
KOCU-K 35	10	80	85	46	116	45	120		35			
KOCU-K 40		90	95			55	130		40			
KOCU-K 45		110	105			60	140		45			



Article no.:	Article name:	Bolt Ø D:	Stroke:	Width W:	Length L:	I1:	I2:	I3:	I4:
260001112	KOCU-K 12 Bolt holder set	12	17	31	30	17	16	25	12
260001116	KOCU-K 16 Bolt holder set	16	23	38	40	22	20	30	16
260001120	KOCU-K 20 Bolt holder set	20	28	44	50	26	22	40	20
260001125	KOCU-K 25 Bolt holder set	25	31	52	55	32	26	45	25
260001130	KOCU-K 30 Bolt holder set	30	40	60	60	38	30	50	30



Article no.:	Article name:	Bolt Ø D:	Stroke:	Bolt length L:	D1:	I3:	I4:	G:
26001812450	KOCU-K Cooling bolt set 12-450	12	17	450	4	19	63	M10x1
26001816450	KOCU-K Cooling bolt set 16-450	16	23		6	24	74	
26001816950	KOCU-K Cooling bolt set 16-950			950				
26001820440	KOCU-K Cooling bolt set 20-440	20	28	440				
26001820940	KOCU-K Cooling bolt set 20-940			940				
26001825435	KOCU-K Cooling bolt set 25-435	25	31	435			78	
26001825935	KOCU-K Cooling bolt set 25-935			935				
26001830935	KOCU-K Cooling bolt set 30-935	30	40		905	10	46	
260018351000	KOCU-K Cooling bolt set 35-905	35	45					
260018401000	KOCU-K Cooling bolt set 40-905	40	50					
260018451000	KOCU-K Cooling bolt set 45-905	45	55					

# KOCU-K - Inclined ejector units

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>
<b>Self-lubricating</b>		Yes	Yes	Yes	Yes	Yes	Yes
<b>Lubricant</b>		Graphite	Graphite	Graphite	Graphite	Graphite	Graphite
<b>Max. surface pressure</b> [ N/mm <sup>2</sup> ]		100	100	120	130	120	50
<b>Max. sliding speed</b> [ m/min ]		30	10	10	15	10	50
<b>Max. P*v-Wert</b> [ N/mm <sup>2</sup> * m/min ]		200	150	200	200	200	100
<b>Temperature</b> [ °C ]	<i>Standard Max</i>	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +300	-50 / +200 +400
<b>Friction coefficient**</b>	<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
<b>Brinell hardness</b> [ HB ]		>210	>210	>260	220 ~ 260	>280	>60
<b>Further information</b>							
<b>Elongation</b> [ % ]		>12	>18	>2	>3	>0,5	>15
<b>Density</b> [ kg/dm <sup>3</sup> ]		7,9	7,7	7,8	7,8	7,2	8,7
<b>Tensile strength</b> [ N/mm <sup>2</sup> ]		>755	>686	>833	>700	>550	>195
<b>Yield strength</b> [ N/mm <sup>2</sup> ]		>412	>372	>509	-	-	>105
<b>E-Module</b> [ N/mm <sup>2</sup> ]		97000	108000	123600	108000	145000	96000
<b>Thermal expansion</b> [ 10 <sup>-5</sup> * 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 +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#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>
<b>Fresh Water</b>	○	◎	◎	X	◎	○
<b>Sea Water</b>	△	○	○	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>	
<b>Alcohol</b>	◎	◎	◎	-	◎	-
<b>Formic acid</b>	-	-	-	-	-	X
<b>Chlorine (dry)</b>	◎	◎	◎	-	◎	-
<b>Chlorine (wet)</b>	X	△	△	-	-	-
<b>Chromic acid</b>	X	X	X	X	-	-
<b>Acetic acid</b>	X	X	◎ (20°C) △ (118°C)	X	◎	○
<b>Hydrochloric acid</b>	-	○	○	X	-	X
<b>Concentrated hydrochloric acid</b>	X	X	△	X	X	-
<b>Lactic acid</b>	X	X	X	X	○	X
<b>Phenol</b>	-	-	-	-	-	X
<b>Phosphoric acid</b>	X	○	○	X	△	X
<b>Nitric acid</b>	X	X	X	X	○	-
<b>Sulfuric acid (40-80%)</b>	X	△	△	X	△	X* △**
<b>Sulfuric acid (80-95%)</b>	X	○	○	X	△	X* △**
<b>Diluted hydrochloric acid</b>	△	-	-	-	-	X
<b>Hydrogen peroxide</b>	△	○	○	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	

# KOCU-K - Inclined ejector units

General and technical information



## 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.

