



igubal®

Pivoting bearings
Articulated heads
Pivoting pedestal bearings
High-performance polymers



igubal® - self-adjusting, maintenance-free sliding bearings made of high-performance plastics

igubal® puts a complete system of self-adjusting bearing elements - pivoting bearings, articulated heads, flange bearings and pedestal bearings - at the developers' fingertips. Self-adjusting bearings are easy to install, adapt to all angular deviations and replace special housings in many cases.

With igubal®, the user can simultaneously take advantage of all the benefits of the high-performance plastics used: they can be used for **technically dry** applications, are highly insensitive to dirt, can run in liquids and even in chemicals and are completely corrosion-proof.

They are very light, save on installation space thanks to their small dimensions and can **save on costs twice** over: firstly, at the time of their purchase and, secondly, in operation due to the elimination of maintenance and installation costs.



igubal® pivoting bearings are extremely favourable in terms of costs.



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Overview

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Why should you use polymers instead of steel?

The use of plastic machine components has constantly increased in recent years, particularly in the bearings sector.

On the one hand, considerable cost savings can sometimes be achieved with plastic machine components.

On the other hand, this is doubtless a result of the tremendous developments in the field of compounded high-performance plastics which are coming ever closer to matching the properties of steel, even surpassing them in individual, important criteria:

igubal® is dry-running and self-lubricating

- No need for additional maintenance
- No contamination by oil or grease
- No failure due to lubricant ageing
- Seizing is impossible

igubal® is light, but still absorbs high forces

- Only 20% the weight of steel
- But it still absorbs high forces

igubal® is advantageous in difficult environments

- Insensitive to dirt, fibres and dust
- Totally corrosion-free
- High chemical resistance
- Very good vibration resistance

igubal® saves costs

- Savings on purchase costs up to much more than 50%*)
- No maintenance costs
- No costs due to machine failure, as seizing is impossible

*) compared to conventional self-adjusting bearings

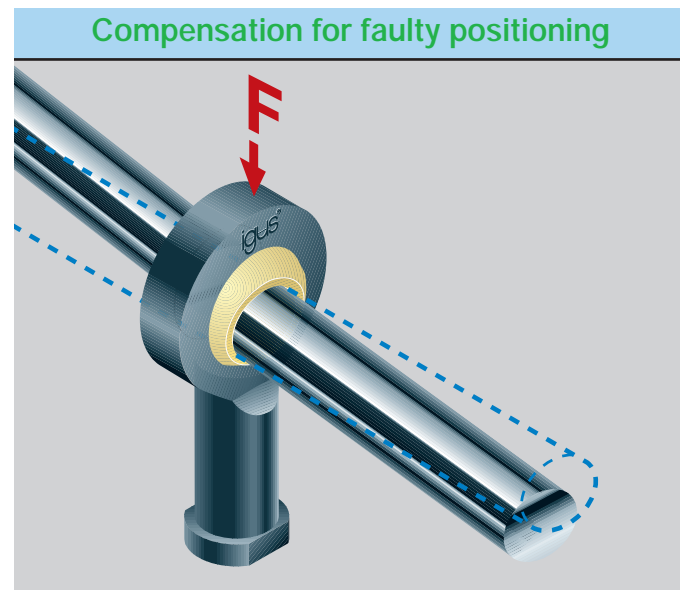


Illustration 200.1: Angle errors can be compensated for by the two-piece structure

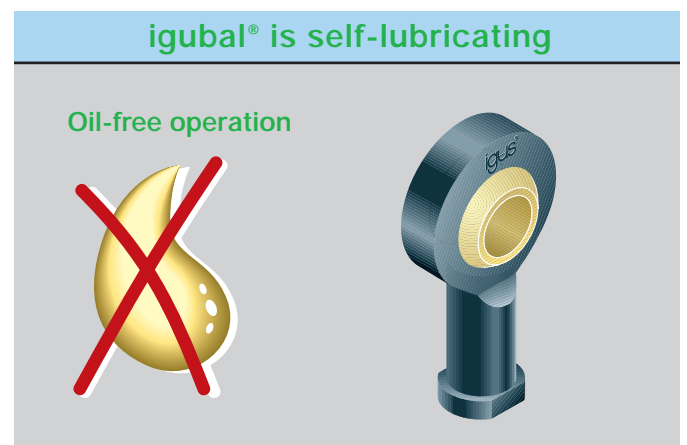


Illustration 200.2: igubal® maintenance-free dry-running



Fig. 200.1: igubal® is a system of self-adjusting bearing elements

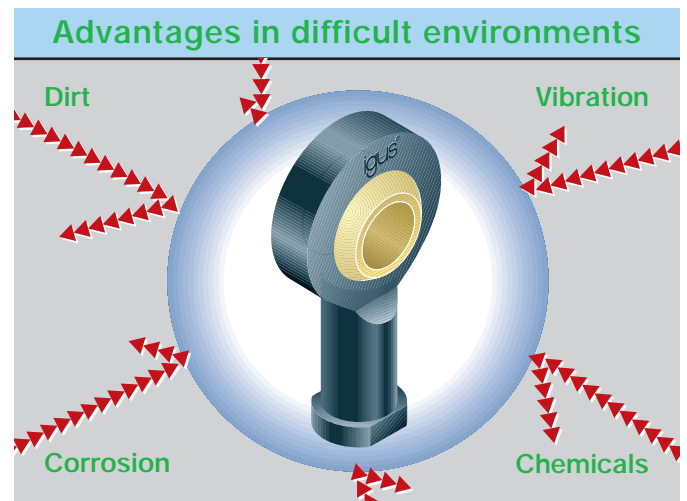


Illustration 200.3: igubal® resists external influences

What is igubal®?

igubal® is a system of self-adjusting bearing elements which are made completely of plastics.

Maintenance-free and very low-clearance fitting of the inner race in the housing is achieved by overmoulding (overinjection of the initially manufactured inner race). The combination of materials is a deciding factor in this context, as this determines the inner race's freedom of movement within the housing.

Inner race

The inner race of the standard pivoting bearings is made of iglidur J, which is characterised by very low friction coefficients when running dry. In this context, the stick-slip tendency is extremely low, a fact which is particularly significant in cases of low loads and very slow speeds.

Housing

The housings for standard igubal® pivoting bearings are made of igulen G2, a particularly impact-resistant, long fibre-reinforced polymer.

igubal® - manufactured by the overmoulding process

- Extremely low-cost manufacturing process
- Particularly low-cost for mass production
- Inner races with very small clearance
- No penetration of dirt

igubal® - inner races made of iglidur J

- Very low friction coefficients when running dry
- Very good abrasion resistance
- Maintenance-free dry-running
- Very good chemical resistance
- Suitable for rotary, oscillating and linear movements

igubal® - housings made of igulen G2

- Low weight
- High mechanical strength
- Impact and shock-resistant



Fig. 200.2: igubal® is a system of self-adjusting bearing elements which are made completely of plastic.



Illustration 200.4: Overmoulding makes it possible: spherical bearings consisting of only two components

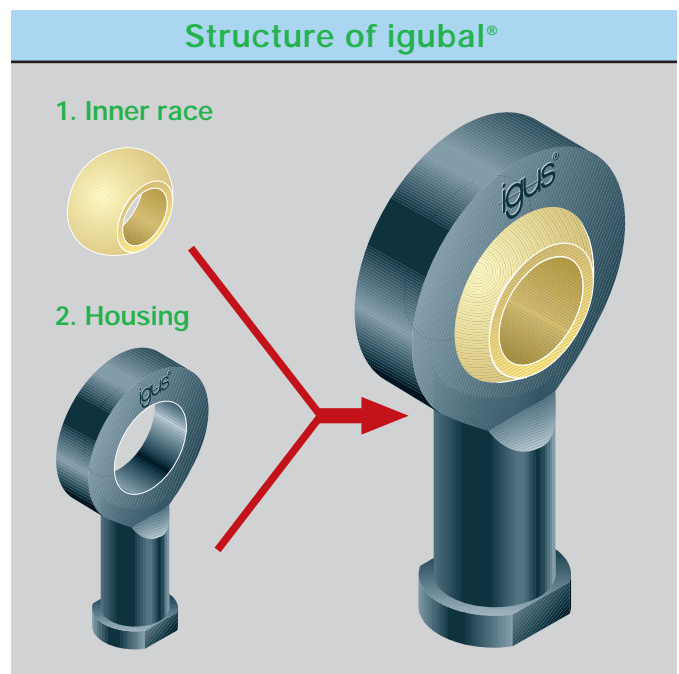


Illustration 200.5: Inner race made of iglidur J: highly wear-resistant with low friction coefficient. Housing made of igulen G2: high mechanical strength

Fields of application for igubal®

The mechanical strength of igubal® sliding bearings is sufficient for most applications involving pneumatic drives.

igubal® articulated heads in a pneumatic swivelling drive

Cylinder:	63 mm
Operating pressure:	6 bar
Rod diameter:	16 mm
igubal® articulated head:	KBRM-16
Adjusting force:	100 - 500N
Cycles per day:	48,000

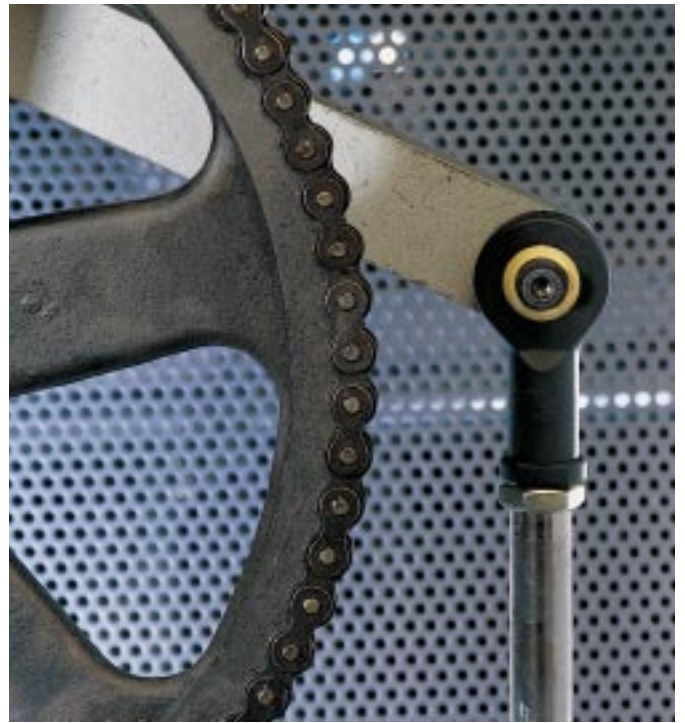


Fig. 200.3: Use of an igubal® articulated head

igubal® articulated heads

Conventional articulated heads quickly reach the limits of their maintenance-free status under extreme conditions, such as dust, vibrations, temperatures or operation in moist environments.

The new igubal® maintenance-free articulated heads remain maintenance-free, no matter how extreme the environment is. Be it fine dust or coarse dirt, high-frequency vibrations or pressures up to 20 N/mm², even under water or in chemicals, there is no danger of seizing or jamming with igubal® articulated heads.

The self-lubricating bearings are technically dry-running, the incorporated solid lubricants ensuring low friction levels and maximum abrasion resistance.

In contrast to maintenance-free metallic articulated heads, igubal® maintenance-free articulated heads are particularly suitable for mounting rotating shafts. In this case, **the shaft itself rotates in the bearing cap**.

Even **linear movements** of the shafts in the cap are possible.



Illustration 200.6: The structure of iglidur® : base polymer, fillers and solid lubricants

Fields of application

igubal® articulated heads can be installed dry. This is achieved by the special plastic compound used for the bearing cap. The thermoplastic alloy forms the basis, while the solid lubricants perform the self-lubrication task of the sliding bearings and the fillers and engineering fibres optimise the mechanical properties. All the components support each other and together produce a highly wear-resistant material with excellent friction coefficients.

igubal® pivoting pedestal bearings can be used in difficult circumstances without any problems. The bearings are corrosion-resistant in moist or wet environments and the sliding bearings are resistant to weak acids and alkalis. The service temperatures range from -40 °C to +80 °C. The level of insensitivity to dirt is outstanding.

The sliding bearings have no need of seals, even under extremely contaminated conditions. This is true of fine dust as well as coarse dirt, such as arises with agricultural machinery, for example. The rod head housing is made of an impact-resistant composite material which permanently tolerates even high alternating loads.



Fig. 200.4: igubal® maintenance-free articulated heads to DIN 648

Special characteristics of igubal® articulated heads

- Maintenance-free dry-running
- High rigidity
- Very high fatigue strength under changing loads
- Compensation for alignment errors
- Compensation for edge loads
- Insensitive to dirt, dust and fluff
- Corrosion and chemical-resistant
- High damping capacity
- Suitable for rotary, oscillating and axial movements
- Very low weight
- Dimensions to DIN 648, size ranges K and E

Loads

The load-bearing capacity of the maintenance-free, plastic articulated heads is very high at normal ambient temperatures. They absorb high forces, possess very good damping properties and yet weigh only a fifth of conventional metallic bearing housings.

However, plastic-specific properties, such as dependence on temperature and behaviour under long-time stressing, must be taken into consideration when using the articulated heads. The load-bearing capacity of the articulated heads in individual cases should therefore be checked in a practical test, particularly if they are to be used under continuously high loads and at elevated temperatures.

Sliding friction coefficients and speeds

One important advantage of igubal® maintenance-free articulated heads is that rapid, rotary movements of the mounted shaft take place directly in the bearing cap made of iglidur. In maintenance-free metallic articulated heads, each movement takes place between the cap and the spherical housing. The peripheral speeds are thus automatically higher, which ultimately adds up to tighter limits on the permissible rpm speed.

igubal® maintenance-free articulated heads are used in such a way that the angular movements of the spherical bearings take place at the spherical outer diameter of the bearing cap. In contrast, rotations of the shaft are supported directly in the bore of the cap. The advantage thus lies in the plastic/steel sliding bearing arrangement, which also permits high sliding speeds, even when running dry.

Taking radial loads into consideration, maximum sliding speeds of up to 1.5 m/s are possible with rotary movements. It is particularly interesting to note that these **articulated heads also permit linear movements of the shaft** without any difficulties.



Fig. 200.5: igubal® articulated heads weigh only a fraction of conventional metallic articulated heads.

Rotating shaft and compensating cap

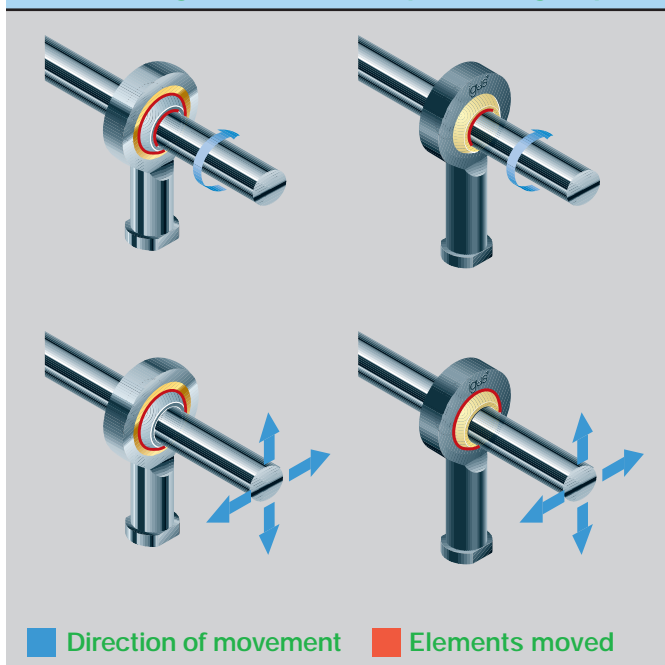


Illustration 200.7: The cap of the igubal® bearing elements only compensates for angular movements. The shaft rotates directly in the inner race during rotary movements.

Service temperatures

igubal® articulated heads can be used at temperatures between -40 °C and a maximum of $+80\text{ °C}$. The drop in mechanical strength at higher temperatures must be taken into consideration, as this particularly limits use under permanently high forces.

Table 200.1
Maximum service temperatures of the maintenance-free articulated heads

Wear limit °C-	Continuous service temperature °C	Short-term °C
80	80	120

Chemical resistance

Both the bearing cap made of iglidur and the housing are resistant to weak alkalis and weak acids, as well as to fuels and all types of lubricants.

Please contact us if you have any questions about the resistance of our igubal® bearings.

Delivery range

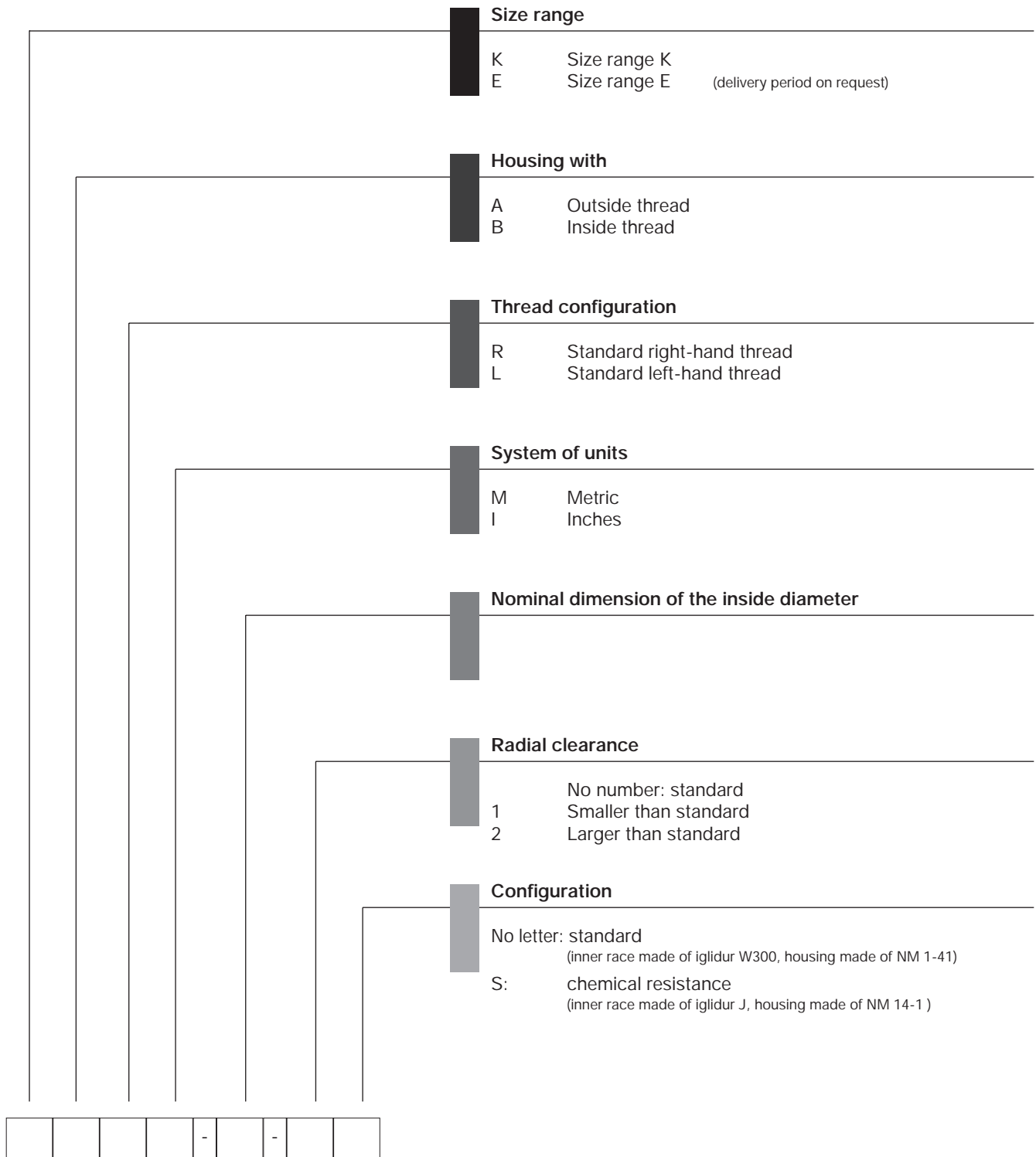
In size ranges K and E, igubal® articulated heads are available for all shaft diameters between 5 mm and 40 mm, with dimensions to DIN 648, either in Form A (with outside thread) or Form B (with inside thread).

Please contact us for information on further sizes, delivery periods and prices.

The articulated heads can be used with different tolerances, depending on the application. The standard range of articulated heads have a small clearance. This permits reliable operation, even at high peripheral speeds. The bore of the inner race has a tolerance to E 10. If you require smaller or larger clearances, please contact us.

Vakat

Article number structure for igubal articulated heads



Example:

K	B	R	M	-	10
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Metric articulated head, size range K, with right-hand inside thread for rod M10 and $d_1 = \varnothing 10$ mm

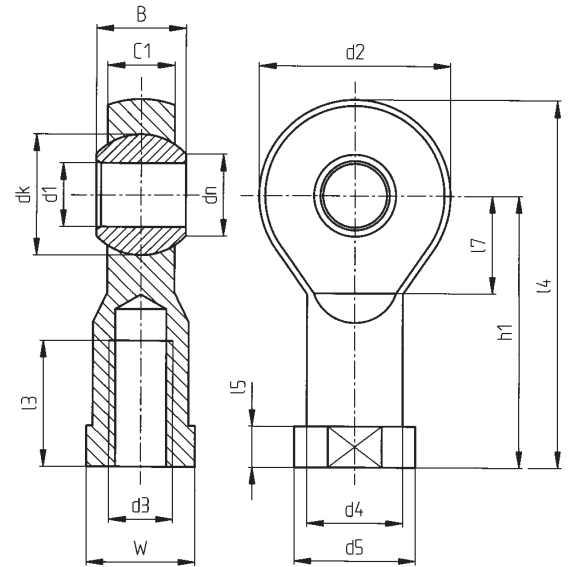
Dimensions for igubal® articulated head

Size range K

Form B

Description to DIN 648

Delivery period: from stock



Metrical sizes

Article No.

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	d ₄	d ₅	d _k	C ₁	B	h ₁	/ ₃	/ ₄	/ ₅	/ ₇	W
KBRM-05	KBLM-05	5	7,7	18	M05	9,0	12	11,10	6	8	27	10	36	4	9	SW09
KBRM-06	KBLM-06	6	8,9	20	M06	10,0	13	12,70	7	9	30	12	40	5	10	SW11
KBRM-08	KBLM-08	8	10,3	24	M08	13,0	16	15,80	9	12	36	16	48	5	12	SW14
KBRM-10	KBLM-10	10	12,9	30	M10	15,0	19	19,00	10,5	14	43	20	58	6,5	14	SW17
KBRM-12	KBLM-12	12	15,4	34	M12	18,0	22	22,20	12	16	50	22	67	6,5	16	SW19
KBRM-14	KBLM-14	14	16,8	38	M14	20,0	25	25,40	13,5	19	57	25	76	8	18	SW22
KBRM-16	KBLM-16	16	19,3	42	M16	22,0	27	28,50	15	21	64	28	85	8	21	SW22
KBRM-18	KBLM-18	18	21,8	46	M18x1,5	25,0	31	31,70	16,5	23	71	32	94	10	23	SW27
KBRM-20	KBLM-20	20	24,3	50	M20x1,5	28,0	34	34,90	18	25	77	33	102	10	25	SW30
KBRM-22	KBLM-22	22	25,8	56	M22x1,5	30,0	37	38,10	20	28	84	37	112	12	27	SW32
KBRM-25	KBLM-25	25	29,5	60	M24x2,0	32,0	41	42,85	22	31	94	42	124	12	30	SW36
KBRM-30	KBLM-30	30	34,8	70	M30x2,0	37,0	50	50,80	25	37	110	51	145	15	35	SW41

Special metrical sizes

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	d ₄	d ₅	d _k	C ₁	B	h ₁	/ ₃	/ ₄	/ ₅	/ ₇	W
KBRM-10 M10 x 1,25	KBLM-10 M10 x 1,25 LH	10	12,9	30	M10x1,25	15,0	19	19,0	10,5	14	43	20	58	6,5	14	SW17
KBRM-12 M12 x 1,25	KBLM-12 M12 x 1,25 LH	12	15,4	34	M12x1,25	18,0	22	22,2	12,0	16	50	24	67	6,5	16	SW19
KBRM-16 M16 x 1,5	KBLM-16 M16 x 1,5 LH	16	19,3	42	M16x1,5	22,0	27	28,5	15,0	21	64	31	85	8,0	21	SW22
KBRM-20 M20	KBLM-20 M20 LH	20	24,3	50	M20	28,0	34	34,9	18,0	25	77	38	102	10,0	25	SW30

Inch sizes

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	d ₄	d ₅	d _k	C ₁	B	h ₁	/ ₃	/ ₄	/ ₅	/ ₇	W
KBRI-03	KBLI-03	.1900	.307	.5625	10-32	.406		.438	.234	.312	1.062	.500	1.374		.356	.312
KBRI-04	KBLI-04	.2500	.354	.6562	1/4-28	.469		.516	.250	.375	1.312	.687	1.687		.396	.375
KBRI-05	KBLI-05	.3125	.447	.7500	5/16-24	.500		.625	.312	.437	1.375	.687	1.813		.443	.437
KBRI-06	KBLI-06	.3750	.504	.8125	3/8-24	.687		.718	.359	.500	1.625	.812	2.125		.570	.562
KBRI-07	KBLI-07	.4375	.601	.9062	7/16-20	.750		.828	.406	.562	1.812	.937	2.374		.595	.625
KBRI-08	KBLI-08	.5000	.700	1.0000	1/2-20	.875		.938	.453	.625	2.125	1.062	2.781		.620	.750
KBRI-10	KBLI-10	.6250	.838	1.1875	5/8-18	1.000		1.125	.464	.750	2.500	1.375	3.250		.715	.875
KBRI-12	KBLI-12	.7500	.978	1.4375	3/4-16	1.125		1.312	.593	.875	2.875	1.562	3.750		.869	1.000

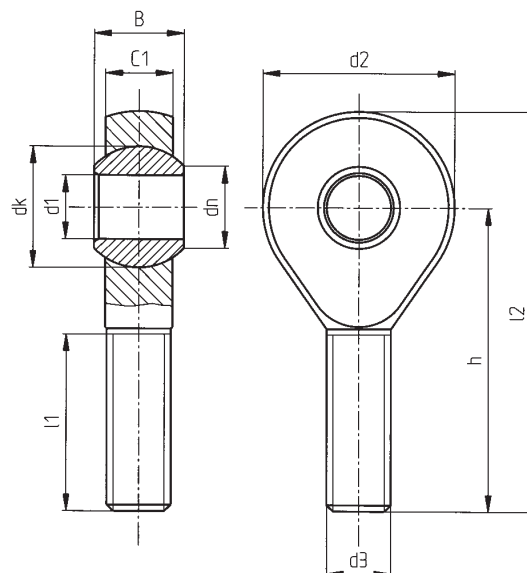
Dimensions for igubal® articulated head

Size range K

Form A

Description to DIN 648

Delivery period: from stock



Metrical sizes

Article No.

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	dk	C ₁	B	h	/1	/2
KARM-05	KALM-05	5	7,7	18	M05	11,1	6,0	8	33	19	42
KARM-06	KALM-06	6	8,9	20	M06	12,7	7,0	9	36	21	46
KARM-08	KALM-08	8	10,3	24	M08	15,8	9,0	12	42	25	55
KARM-10	KALM-10	10	12,9	30	M10	19,0	10,5	14	48	28	63
KARM-12	KALM-12	12	15,4	34	M12	22,2	12,0	16	54	32	71
KARM-14	KALM-14	14	16,8	38	M14	25,4	13,5	19	61	36	79
KARM-16	KALM-16	16	19,3	42	M16	28,5	15,0	21	66	37	88
KARM-18	KALM-18	18	21,8	46	M18x1,5	31,7	16,5	23	72	41	96
KARM-20	KALM-20	20	24,3	50	M20x1,5	34,9	18,0	25	78	45	104
KARM-22	KALM-22	22	25,8	56	M22x1,5	38,1	20,0	28	84	48	112
KARM-25	KALM-25	25	29,5	61	M24x2,0	42,8	22,0	31	94	55	125
KARM-30	KALM-30	30	34,8	71	M30x2,0	50,8	25,0	37	110	66	147

Special metrical sizes

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	dk	C ₁	B	h	/1	/2
KARM-10 M 10 x 1,25	KALM-10 M 10 x 1,25 LH	10	12,9	30	M10x1,25	19,0	10,5	14	43	28	63
KARM-12 M 12 x 1,25	KALM-12 M 12 x 1,25 LH	12	15,4	34	M12x1,25	22,2	12,0	10	50	32	71
KARM-16 M 16 x 1,5	KALM-16 M 16 x 1,5 LH	16	19,3	42	M16x1,5	28,5	15,0	21	64	37	88
KARM-20 M 20	KALM-20 M 20 LH	20	24,3	50	M20	34,9	18,0	25	77	45	104

Inch sizes

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	dk	C ₁	B	h	/1	/2
KARI-03	KALI-03	.1900	.307	.5625	10-32	.438	.234	.312	1.250	.750	1.563
KARI-04	KALI-04	.2500	.354	.6562	1/4-28	.516	.250	.375	1.562	1.000	1.937
KARI-05	KALI-05	.3125	.447	.7500	5/16-24	.625	.312	.437	1.875	1.250	2.313
KARI-06	KALI-06	.3750	.504	.8125	3/8-24	.718	.359	.500	1.938	1.250	2.438
KARI-07	KALI-07	.4375	.601	.9062	7/16-20	.828	.406	.562	2.125	1.375	2.688
KARI-08	KALI-08	.5000	.700	1.0000	1/2-20	.938	.453	.625	2.438	1.500	2.094
KARI-10	KALI-10	.6250	.838	1.1875	5/8-18	1.125	.484	.750	2.625	1.625	3.375
KARI-12	KALI-12	.7500	.978	1.4375	3/4-16	1.312	.593	.875	2.875	1.750	3.750

¹⁾ Barrel gauge test

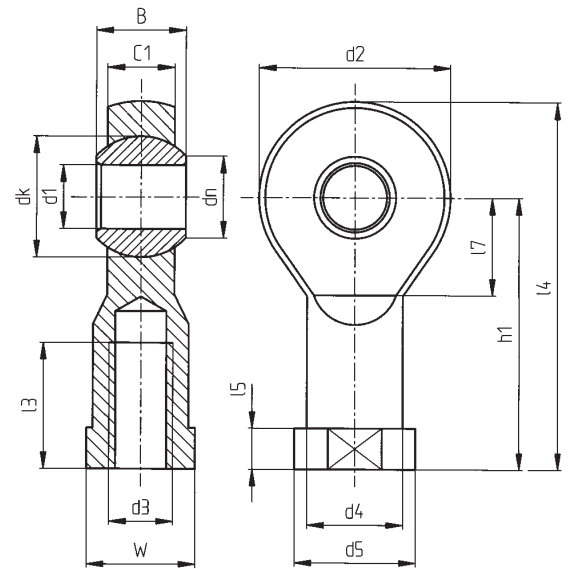
Dimensions for igubal® articulated head

Size range E

Form B

Description to DIN 648

Delivery period: on request



Metrical sizes

Article No.

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	d ₄	d ₅	d _k	C ₁	B	h ₁	l ₃	l ₄	l ₅	l ₇	W
EBRM-05	EBLM-05	5	7	19	M05	9	11	10	4,4	6	30	12	39,5	4	14,0	SW09
EBRM-06	EBLM-06	6	8	21	M06	11	13	10	4,4	6	30	12	40,5	5	14,0	SW11
EBRM-08	EBLM-08	8	10	24	M08	13	16	13	6	8	36	16	48,0	5	16,0	SW14
EBRM-10	EBLM-10	10	13	29	M10	15	19	16	7	9	43	18	57,5	6,5	18,5	SW17
EBRM-12	EBLM-12	12	15	34	M12	18	22	18	8	10	50	20	67,0	6,5	22,0	SW19
EBRM-15	EBLM-15	15	18	40	M14	21	26	22	10	12	61	26	81,0	8	25,0	SW22
EBRM-17	EBLM-17	17	20	46	M16	24	30	25	11	14	67	27	90,0	10	28,0	SW27
EBRM-20	EBLM-20	20	24	53	M20x1,5	27	34	29	13	16	77	31	103,5	10	32,0	SW30
EBRM-25	EBLM-25	25	29	64	M24x2,0	34	41	35	17	20	94	38	126,5	11	39,0	SW36
EBRM-30	EBLM-30	30	34	73	M30x2,0	41	48	40	19	22	110	47	146,5	14	42,0	SW41

Special metrical sizes

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	d ₄	d ₅	d _k	C ₁	B	h ₁	l ₃	l ₄	l ₅	l ₇	W
EBRM-10 M 10 x 1,25	EBLM-10 M 10 x 1,25 LH	10	13	29	M10x1,25	15	19	16	7	9	43	18	57,5	6,5	18,5	SW17
EBRM-12 M 12 x 1,25	EBLM-12 M 12 x 1,25 LH	12	15	34	M12x1,25	18	22	18	8	10	50	20	67,0	6,5	22,0	SW19
EBRM-17 M 16 x 1,5	EBLM-17 M 16 x 1,5 LH	17	20	46	M16x1,5	24	30	25	11	14	67	26	90,0	10,0	28,0	SW27
EBRM-20 M 20	EBLM-20 M 20 LH	20	24	53	M20	27	34	29	13	16	77	31	103,5	10,0	32,0	SW30

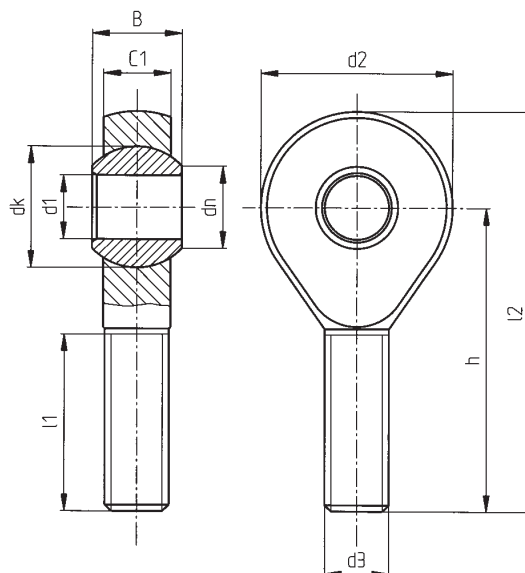
Dimensions for igubal® articulated head

Size range E

Form A

Description to DIN 648

Delivery period: on request



Metrical sizes

Article No.

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	dk	C ₁	B	h	/1	/2
EARM-05	EALM-05	5	7	19	M05	10	4,4	6	36	20	14,0
EARM-06	EALM-06	6	8	21	M06	10	4,4	6	36	20	14,0
EARM-08	EALM-08	8	10	24	M08	13	6	8	41	24	16,0
EARM-10	EALM-10	10	13	29	M10	16	7	9	47	27	18,5
EARM-12	EALM-12	12	15	34	M12	18	8	10	54	29	22,0
EARM-15	EALM-15	15	18	40	M14	22	10	12	63	34	25,0
EARM-17	EALM-17	17	20	46	M16	25	11	14	69	37	28,0
EARM-20	EALM-20	20	24	53	M20x1,5	29	13	16	78	43	32,0
EARM-25	EALM-25	25	29	64	M24x2,0	35	17	20	94	53	39,0
EARM-30	EALM-30	30	34	73	M30x2,0	40	19	22	110	65	42,0

Special metrical sizes

Right-hand thread	Left-hand thread	d ₁ ¹⁾ (E10)	d _n	d ₂	d ₃	dk	C ₁	B	h	/1	/2
EARM-10 M 10 x 1,25	EALM-10 M 10 x 1,25 LH	10	13	29	M10x1,25	16	7	9	47,5	27	62,0
EARM-12 M 12 x 1,25	EALM-12 M 12 x 1,25 LH	12	15	34	M12x1,25	18	8	10	54,0	29	71,0
EARM-17 M 16 x 1,5	EALM-17 M 16 x 1,5 LH	17	20	46	M16x1,5	25	11	14	69,0	37	92,0
EARM-20 M 20	EALM-20 M 20 LH	20	24	53	M20	29	13	16	80,0	43	106,5

¹⁾ Barrel gauge test

igubal® pedestal bearings

The new igubal® pedestal bearings consist of a housing with an integrated bearing cap. The igubal® pivoting pedestal bearing is thus a bearing unit which is particularly easy to install, compensating for alignment errors and avoiding edge pressures.

The housings are made of an impact-resistant, particularly rigid thermoplastic composite material. They absorb forces in a similar manner to steel, possess excellent damping properties and yet weigh only a fifth of conventional metallic bearing housings.

The interior bearing cap, made of the maintenance-free bearing material iglidur J as standard, is particularly abrasion-resistant and designed for dry applications. Thanks to the low friction coefficient, high sliding speeds up to a maximum of 1.5 m/s for rotary movements and 8 m/s for linear movements can be supported.

Special characteristics of igubal® pivoting pedestal bearings

- Maintenance-free dry-running
- High rigidity
- High fatigue strength under changing loads
- Compensation for alignment errors
- Compensation for edge loads
- Corrosion-resistant
- Chemical-resistant
- High damping capacity
- Suitable for rotary, oscillating and axial movements
- Very low weight

Fields of application

The two spherical components put igubal® pivoting pedestal bearings in an excellent position to compensate for alignment errors, faulty positioning and shaft deflections. The main fields of application are therefore those in which such effects cannot be prevented by design measures.

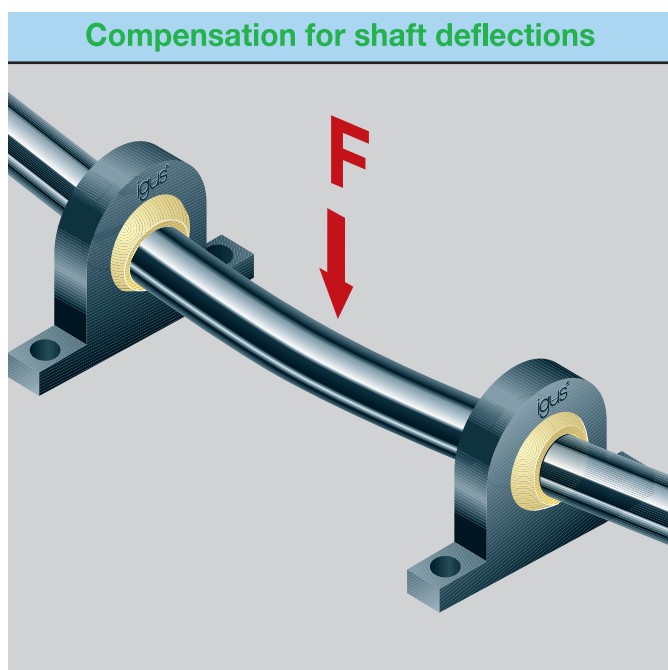


Illustration 200.8: igubal® pedestal bearings absorb very high forces and are self-aligning



Fig. 200.6: igubal® pedestal bearings: a wealth of benefits for the little space needed

The maintenance-free design of igubal® pedestal bearings opens up further fields of application. igubal® pedestal bearings can be installed dry. Self-lubrication is achieved by the special compound of the bearing cap. The thermoplastic alloy forms the basis, while solid lubricants perform the self-lubrication of the sliding bearings and fillers and engineering fibres optimise the tribological and mechanical properties.



Illustration 200.9: The structure of iglidur®: base polymer, fillers and solid lubricants

All the components support each other and together produce a highly wear-resistant material with excellent friction coefficients.

igubal® pivoting pedestal bearings can also be used in difficult circumstances without any problems. The bearings are corrosion-resistant in moist or wet environments and the sliding bearings are resistant to weak acids and alkalis. The service temperatures range from -40 °C to +100 °C.

The level of insensitivity to dirt is outstanding. The sliding bearings have no need of special seals, even under extremely contaminated conditions. This is true of fine dust as well as coarse dirt, such as arises with agricultural machinery, for example.

Loads

The load-bearing capacity of the maintenance-free, plastic pedestal bearings is very high at normal ambient temperatures. They absorb high forces under pressure in a similar manner to steel, possess very good damping properties and yet weigh only a fifth of conventional metallic bearing housings.

However, plastic-specific properties, such as dependence on temperature and behaviour under long-time stressing, must be taken into consideration when using the articulated heads. The load-bearing capacity of the pivoting bearings in individual cases should therefore be checked in a practical test, particularly if they are to be used under continuously high loads and at elevated temperatures.

Sliding friction coefficients and speeds

Taking radial loads into consideration, maximum sliding speeds of up to 1.5 m/s are possible with rotary movements. igubal® pivoting pedestal bearings can be operated with all possible types of movement without restrictions. Rotary and oscillating movements are just as feasible as linear movements.

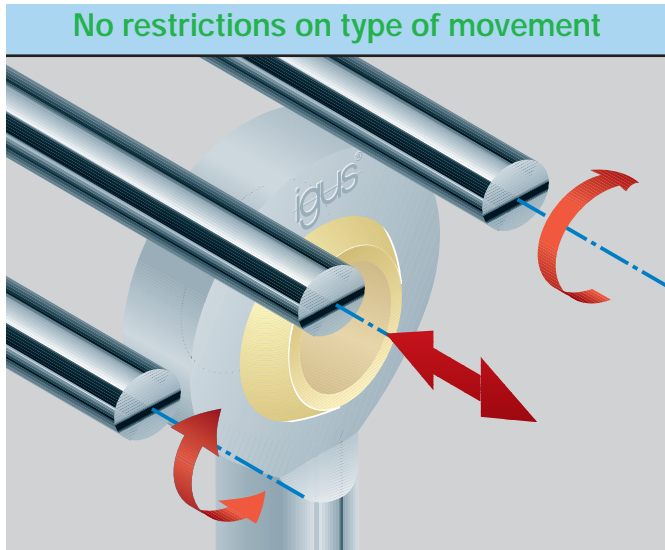


Illustration 200.10: igubal® bearing elements are ideal for all types of movement

Service temperatures

igubal® pivoting bearings can be used at temperatures between -40 °C and a maximum of +80 °C. The drop in mechanical strength at higher temperatures must be taken into consideration, as this particularly limits use under permanently high forces.

Table 200.2
Maximum service temperatures of the maintenance-free articulated heads

Wear limit °C	Continuous service temperature °C	Short-term °C
80	80	120

Chemical resistance

Both the bearing cap made of iglidur J and the housing are resistant to weak alkalis and weak acids, as well as to fuels and all types of lubricants.

Fitting tolerances

igubal® maintenance-free pivoting pedestal bearings are designed with a tolerance to E 10. Thermal expansion of the bearings can be compensated for by the bearing clearance.

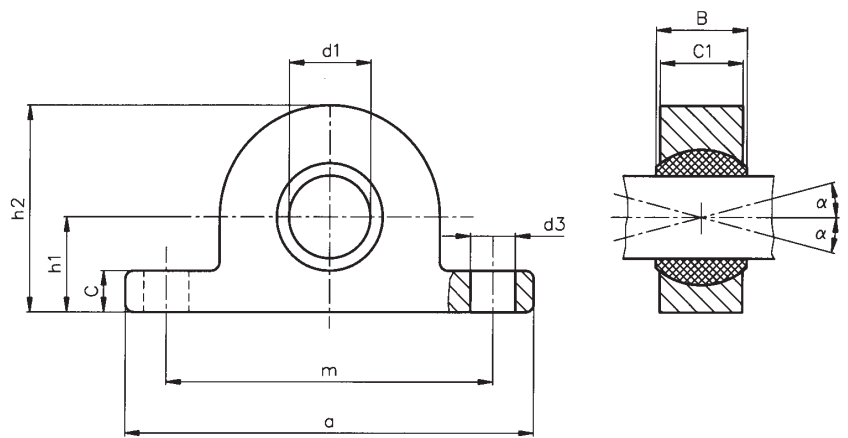
Installation

igubal® pivoting pedestal bearings are designed for fastening with 2 screws. Exact alignment of the bearing housings is unnecessary, as the pivoting bearing compensates for alignment errors itself.

Delivery range

igubal® pivoting pedestal bearings are available in the standard dimensions for shafts between 10 mm and 30 mm. Please contact us for information on delivery periods and further sizes.

Dimensions for igubal® pedestal bearings



Metrical sizes

Article No.	d ₁ ¹⁾ (E10)	d _n	d _k	B	C ₁	h ₁	h ₂	a	c	m	d ₃
JAM-05	5	7,7	11,1	8	6,0	7	14	36	3	25	3,3
JAM-06	6	8,9	12,7	9	7,0	10	20	44	4	33	4,5
JAM-08	8	10,3	15,8	12	9,0	10	20	44	4	33	4,5
JAM-10	10	12,9	19,0	14	10,5	14	28	60	6	46	5,5
JAM-12	12	15,4	22,2	16	12,0	14	28	60	6	46	5,5
JAM-14	14	16,8	25,4	19	13,5	18	36	80	6	60	6,5
JAM-16	16	19,3	28,5	21	15,0	18	36	80	6	60	6,5
JAM-18	18	21,8	31,7	23	16,5	22	44	88	9	68	8,5
JAM-20	20	24,3	34,9	25	18,0	22	44	88	9	68	8,5
JAM-22	22	25,8	38,1	28	20,0	24	48	97	9	74	8,5
JAM-25	25	29,5	42,8	31	22,0	27	54	110	10	86	8,5
JAM-30	30	34,8	50,8	37	25,0	32	64	124	10	96	10,5

Inch sizes

Article No.	d ₁ ¹⁾ (E10)	d _n	d _k	B	C ₁	h ₁	h ₂	a	c	m	d ₃
JAI-03	.1900	.307	.438	.312	.234	.290	.580	1.420	.120	1.000	.137
JAI-04	.2500	.354	.516	.375	.250	.390	.780	1.720	.160	1.250	.137
JAI-05	.3125	.447	.625	.437	.312	.430	.860	1.850	.160	1.350	.150
JAI-06	.3750	.504	.718	.500	.359	.550	1.100	2.500	.240	1.800	.180
JAI-07	.4375	.601	.828	.562	.406	.570	1.140	2.550	.240	1.850	.205
JAI-08	.5000	.700	.938	.625	.453	.600	1.200	2.800	.240	2.000	.205
JAI-10	.6250	.838	1.125	.750	.484	.700	1.400	3.200	.280	2.300	.205
JAI-12	.7500	.978	1.312	.875	.593	.860	1.720	3.650	.360	2.700	.270
JAI-16	1.0000	1.269	1.875	1.375	1.005	1.100	2.200	4.800	.400	3.500	.520

¹⁾ Barrel gauge test

igubal® pivoting bearings

The design of igubal® pivoting bearings opens up a whole new world of possibilities. Up to now, the use of pivoting bearings was characterised by high costs, difficult installation and high bearing weights. In the long term, maintenance was usually necessary after all, and only special bearing versions were corrosion-resistant.

igubal® puts an end to all these disadvantages:

- igubal® pivoting bearings are easy to handle
- igubal® pivoting bearings are extremely low-cost
- igubal® pivoting bearings are very light
- igubal® pivoting bearings are very sturdy

igubal® pivoting bearings combine many benefits through which the user can achieve extensive improvements in the quality of his products. Rolling or sliding bearings are often subjected to excessive stress by edge loads, thus failing prematurely. Or the bearings are readjusted, rereamed or modified in complicated procedures because alignment errors impede shaft assembly.

Self-adjusting igubal® pivoting bearings are always aligned, so there are no difficulties in connecting the shafts.

Special characteristics of igubal® pivoting bearings

- Maintenance-free dry-running
- Compensation for alignment errors
- Compensation for edge loads
- Corrosion-resistant
- High damping capacity
- Very good vibration reduction
- Suitable for rotary, oscillating and axial movements
- Very low weight

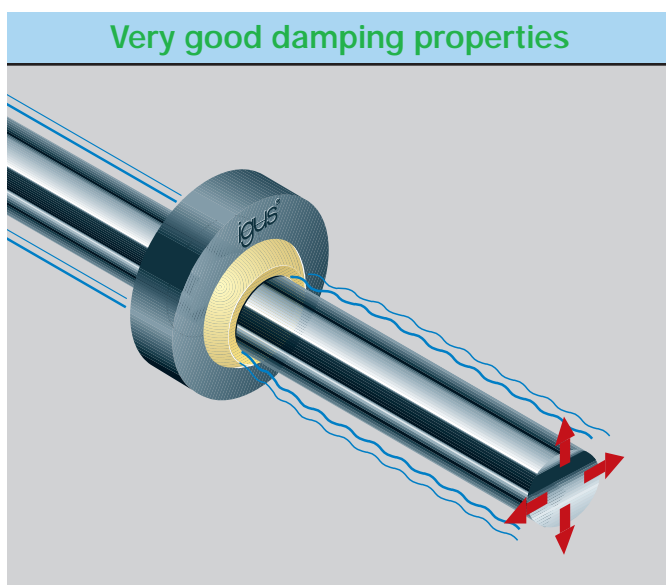


Fig. 200.11: igubal® bearing elements are ideal for all types of movement



Fig. 200.7: igubal® pivoting bearings to DIN 648, size range K

Loads

The load-bearing capacity of igubal® pivoting bearings is very high at normal ambient temperatures. The encapsulation of the pivoting bearings in the housing permits very high radial forces.

The very good damping properties of igubal® pivoting bearings permit operation even in cases of vibrations and high shock loads.

A different combination of materials should be selected for applications involving maximum loads of over 10 N/mm² on the projected surface, as the radial wear on the inner race made of iglidur J increases disproportionately at high loads.

Please contact us for information on applications involving such loads.

Sliding speeds

igubal® pivoting bearings can be operated with all possible types of movement.

Taking radial loads into consideration, sliding speeds of up to a maximum of 1.5 m/s are possible with rotary movements. The same applies to oscillating movements.

Much higher speeds (up to a maximum of 8 m/s) can even be achieved with igubal® pivoting bearings in the case of linear movements.

Temperatures

igubal® pivoting bearings can be used at temperatures between -40 °C and a maximum of +80 °C.

Table 200.3:

Maximum service temperatures of the maintenance-free pivoting bearings

Wear limit °C	Continuous service temperature °C	Short-term °C
80	80	120

Resistance to external influences

igubal® pivoting bearings are resistant to weak alkalis and weak acids, as well as to fuels and all kinds of lubricants.

igubal® pivoting bearings can be used outdoors without any problems. The bearings are UV-resistant and don't rust.

Application possibilities

igubal® pivoting bearings are versatile to use, thanks to their simple handling. In future, igubal® pivoting bearings can be used wherever the self-adjusting bearings yield design benefits or help to simplify installation.

The bearings are installed by simple press-fitting into an H7 bore.

Dimensions

igubal® pivoting bearings are manufactured to DIN 648, size range K. As is usual for pivoting bearings made of polymers, igubal® pivoting bearings are installed with a small bearing clearance.

Dimensions between 5 mm and 30 mm are available in the delivery range. The product range is currently in the preparatory stage. Please contact us for information on delivery periods.

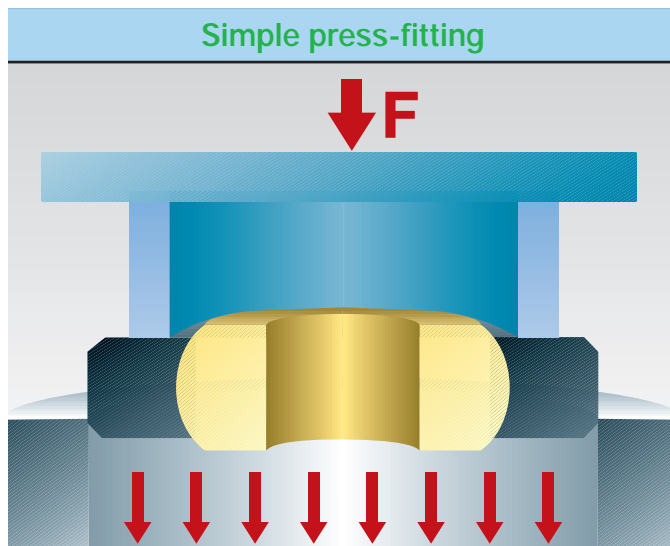
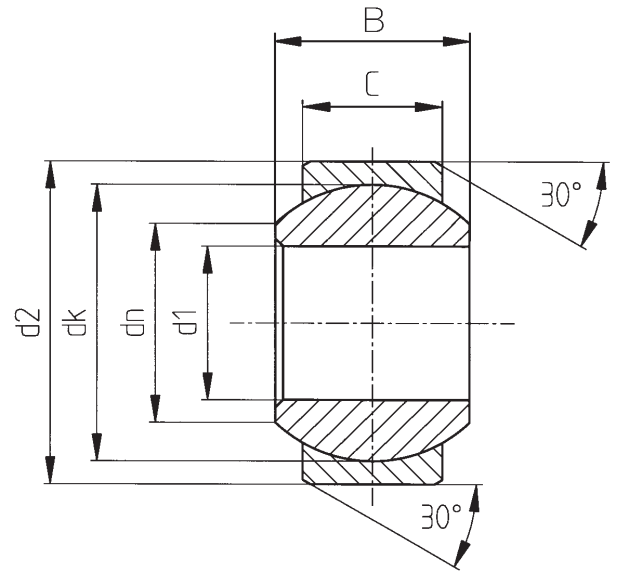


Fig. 200.12: Press-fitting of igubal® pivoting bearings

igubal® pivoting bearings

Size range K
DIN 648



Metrical Sizes

Article No.	d ₁ ¹⁾ (E10)	d ₂ ²⁾	B	C	d _n	d _k
KGLM-05	5	13	8	6	7,7	11,1
KGLM-06	6	16	9	6,5	8,9	12,7
KGLM-08	8	19	12	9	10,3	15,8
KGLM-10	10	22	14	10,5	12,9	19
KGLM-12	12	26	16	12	15,4	22,2
KGLM-14	14	28	19	13,5	16,8	25,4
KGLM-16	16	32	21	15	19,3	28,5
KGLM-18	18	35	23	16,5	21,8	31,7
KGLM-20	20	40	25	18	24,3	34,8
KGLM-22	22	42	28	20	25,8	38,1
KGLM-25	25	47	31	22	29,5	42,8
KGLM-30	30	55	37	25	34,8	50,8

Inch sizes

Article No.	d ₁ ¹⁾ (E10)	d ₂ ²⁾	B	C	d _n	d _k
KGLI-03	.1900	.5625	.312	.218	.307	.438
KGLI-04	.2500	.6562	.375	.250	.354	.516
KGLI-05	.3125	.7500	.437	.281	.447	.625
KGLI-06	.3750	.8125	.500	.312	.504	.718
KGLI-07	.4375	.9062	.562	.343	.601	.828
KGLI-08	.5000	1.0000	.625	.390	.700	.938
KGLI-10	.6250	1.1875	.750	.500	.838	1.125
KGLI-12	.7500	1.4375	.875	.593	.978	1.312
KGLI-16	1.0000	2.1250	1.375	1.005	1.269	1.875

¹⁾ Barrel gauge test

²⁾ Press fit in locating bore D (h7)

igus (UK) Ltd.
10 Newton Close
Drayton Fields
Daventry Northants NN11 5RR
Phone + 44 - (0) 13 27 / 31 03 66
Fax + 44 - (0) 13 27 / 31 03 50



igus GmbH
Postfach 90 61 23
D-51127 Köln
Germany
Phone + 49 - 22 03 / 96 49-0
Fax + 49 - 22 03 / 96 49-222
<http://www.igus.de>