

# BOLEXP



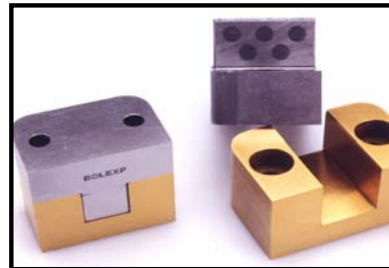
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# BOLEXP

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# BOLEXP , guidance systems

This catalogue shows several guidance systems designed to provide with efficient service and useful solutions to the problems which arise when executing injection moulds and dies, as well as when executing machinery tools and construction in general.

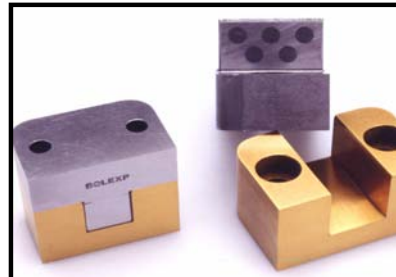
All of the products in the present catalogue are available in stock for immediate delivery in order to offer a better service to meet our customer needs.



Bolexp Ball Guidance is a high-precision rolling system with very reduced travel resistance. It is advisable for rectilinear guides where wide travels, tiny friction, high-precision guidance and positioning, together with reduced wear and long durability, are required. Page 4.

The centerer for moulds guarantees the appropriate alignment for the main plates in the mould. The system of fixing to plate allows to apply machinery to plates in only one operation.

It includes graphite components for self-lubricating pieces and a TiN treatment for reducing seizing. For details, see page 17.



The tilted assembly allows to make the allocations of tilted columns with great agility. The fact of fixing it through the front side of the plate allows for an agile capacity of exchange. 140 models are available in stock, with 7 different degrees and 5 column diameters. For details, see page 21,

Bolexp Self-lubricated Guidance is a travel system which adds-in solid lubricant for its operating, needing little maintenance and exhibiting high resistance in elevated-temperature operating conditions and drastic seizing reduction. For details, see page 24.





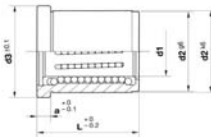
## BALL GUIDANCE

### PRODUCT DESCRIPTION

#### **BALL GUIDE BUSH**

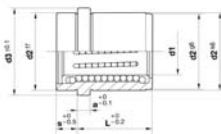
BOLEXP ball guidance bushes are made up of an outer casing of steel for rolling, hardened and ground, which holds fixed inside a high-resistance bronze cage for guiding the balls running along the cage. The translation system consists of several rows of precision balls circulating endlessly.

The great novelty of BOLEXP ball guidance bushes is that balls do not run aligned, with the translation motion, but at a slight angle, thus enlarging the contact area with the shaft and enabling greater load capacity. This patented system represents an utter innovation in the linear guidance market. An all-metal structure makes bushes extremely resistant to high temperatures. BOLEXP bushes are supplied in a variety of three outer forms, all of them equipped with the same inside structure.



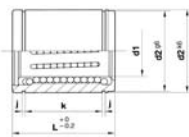
**Model 801**

Bush with an outer cylindrical body and a flange at the end for fixing it.



**Model 802**

Bush with two outer cylindrical bodies and a center flange for fixing it between two plates.



**Model 803**

Bush with an all-cylindrical outer body and two ferrules at the ends for fixing it with security spring rings.

#### **GUIDE COLUMN**

BOLEXP guide column is made of steel 1.5732 with surface hardening, obtaining a hardness of 62-64 RHc, and a depth from 1.00 to 1.20 mm., leaving the shaft core soft so that it can absorb the bending it might be required to. In guide manufacturing, some features are considered to be essential, including the quality of steel, surface hardness and precision and quality of the finish.

## FEATURES

Determining the adequate ball bush size is based on the requirements of the tool to be constructed and the load capacity needed, as well as bush lifetime and operating security.

Use the maximum recommended loads listed in Table I below for calculations.

Made in accordance with report by L.G.A.I. (Generalitat de Catalunya)

<b>TABLE I</b>					
<b>MODEL</b>	<b>Maximum Recommended Load (N)</b>	<b>MODEL</b>	<b>Maximum Recommended Load (N)</b>	<b>MODEL</b>	<b>Maximum Recommended Load (N)</b>
B8012035	1,250	B8022026	1,250	B8031630	882
B8012535	1,250	B8022035	1,915	B8031635	1,250
B8012545	1,985	B8022526	1,250	B8032035	1,250
B8012555	2,721	B8022535	1,985	B8032045	1,912
B8013245	1,691	B8022545	2,721	B8032535	1,250
B8013263	3,015	B8022555	3,456	B8032545	1,985
B8014045	1,691	B8023245	2,574	B8032555	2,721
B8014063	3,015	B8023263	3,897	B8033245	1,691
B8021222	882	B8024045	2,574	B8033263	3,015
B8021622	882	B8024063	3,897	B8035045	1,691
B8021626	1,250	B8031230	882	B8034063	3,015

Use the following formula to calculate nominal life for ball bushes.

$$L_h = (833/H * N_{osc}) * (C/P) \text{ in hours}$$

- L<sub>h</sub>**= Nominal lifetime in operating hours
- H**= Single-way length of oscillatory motion travel in m.
- N<sub>osc</sub>**= Come-and-go motion frequency in 1/min.
- C**= Load capacity in N.
- P**= Equivalent rolling load in N.

### Calculation example:

An injection mould expulsion is guided by four bushes reference B8022535 (C=1,985). The load on each bush is of P=200N, the column travel is of H=0.25 m., the come-and-go motion frequency is of N<sub>osc</sub>=10 1/min. Nominal lifetime has to be calculated.

Solution:  $L_h = (833/0.25 * 10) * (1,985/200) = 300,000 \text{ hours}$

Load capacities and lifetime calculations for bushes shown here above are applicable under precisely defined conditions. Any adverse condition may reduce significantly both measurements.

## TRAVEL ACCURACY

Travel accuracy with a guidance system using shafts with BOLEXP ball linear rolling depends on several factors, such as the positioning precision of bushes or shafts, quality of shafts, free length between shaft supports and length of the bush in relation to the area to be slid. These influences depend basically on the type of application and the load to be supported.

On the whole, the required travel accuracy must be ensured by the features and design of the assembly, as well as by the precise manufacture of adjacent pieces.

Fixing the shaft at its two ends is recommended, particularly in the case of high loads, whenever the project allows it.

## **LUBRICATION**

In order to ensure long durability for BOLEXP ball bushes, proper lubrication and maintenance are a must. The channels that the balls run along must be free of any interfering particles. Moreover, it is recommended to use oil lubrication so as to ensure proper lubrication for the whole of rolling items and, if necessary, to remove all impurities.

We suggest the use of CLP oils according to DIN 51524, within the range of viscosities from ISO VG 64 to 100. Although grease can also be used for lubrication, this is not highly recommended as it fixes dirt particles much more easily.

BOLEXP ball bushes are supplied oiled for its conservation and must be lubricated when necessary. The conservancy fluid is compatible and can be mixed with mineral-based lubricants, making it unnecessary to wash bushes before assembling them.

## **SHAFT EXECUTION**

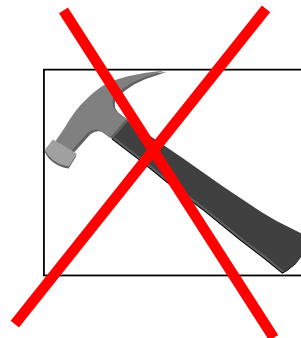
Shafts for BOLEXP ball bushes must be hardened and ground. The ends require a tapering so that rollings cannot be damaged during the assembling. In order to fully benefit from high travel accuracy and load capacity of BOLEXP ball bushes, the shafts around which bushes slid must exhibit the best quality and a properly hard layer.

## **ASSEMBLING AND FIXING**

BOLEXP ball bushes can be mounted either in holes with tolerance H7 or in such a way that they can be manually slid into their cartridge. Never hit them with hammers or any other impacting tool. Otherwise, the bush structure could be damaged.

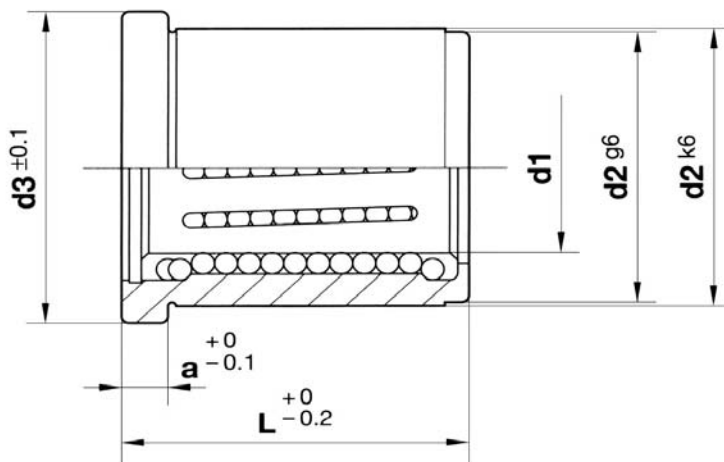
It is recommended to mount at least two units in parallel disposal so as to avoid possible rotation motions in the travelling of items. Bush length is also suggested to be at least twice its diameter in order to minimize the rotation motion of balls, whenever this is possible.

Rotation motions are not advised in this type of bushes, whose function is that of translation.





## BUSH REF. 801



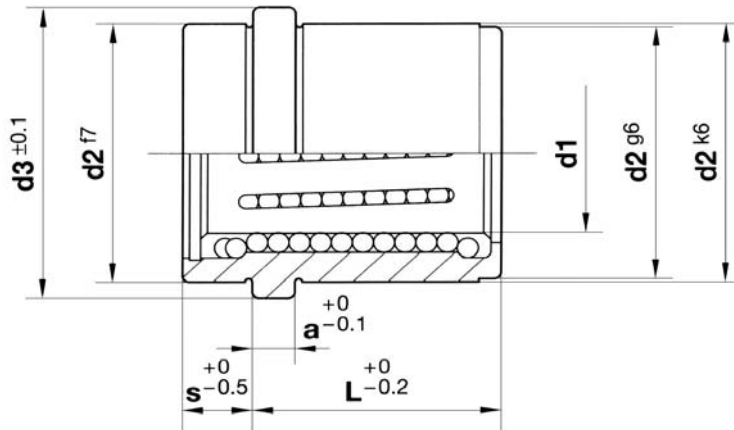
BOLEXP 801							
d1	L	d2	d3	a	Ø ball	Number of lines	Item code
20	35	32	36	6	3	6	B8012035
25	35	40	45	6	3	8	B8012535
25	45	40	45	6	3	8	B8012545
25	55	40	45	6	3	8	B8012555
32	45	50	56	8	4	8	B8013245
32	63	50	56	8	4	8	B8013263
40	45	60	66	8	4	8	B8014045
40	63	60	66	8	4	8	B8014063

**Materials:** Special steel bush. Bronze cage with high resistance to wear.  
High-precision balls. Hardness: 60-62 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.



## BUSH REF. 802



BOLEXP 802									
d1	L	d2	d3	a	s	Ø ball	Number of lines	Item code	
8	12	18	21	3	6	2	5	B8020812	
10	12	20	24	4	9	2.5	5	B8021012	
12	22	24	28	6	8	3	5	B8021222	
16	22	28	32	6	8	3	6	B8021622	
16	26	28	32	6	9	3	6	B8021626	
20	26	32	36	6	9	3	6	B8022026	
20	35	32	36	6	9	3	6	B8022035	
25	26	40	45	6	9	3	8	B8022526	
25	35	40	45	6	10	3	8	B8022535	
25	45	40	45	6	10	3	8	B8022545	
25	55	40	45	6	10	3	8	B8022555	
32	45	50	56	8	12	4	8	B8023245	
32	63	50	56	8	12	4	8	B8023263	
40	45	60	66	8	12	4	8	B8024045	
40	63	60	66	8	12	4	8	B8024063	
50	55	70	76	10	25	4	10	B8025055	
60	55	85	91	10	25	4	12	B8026055	

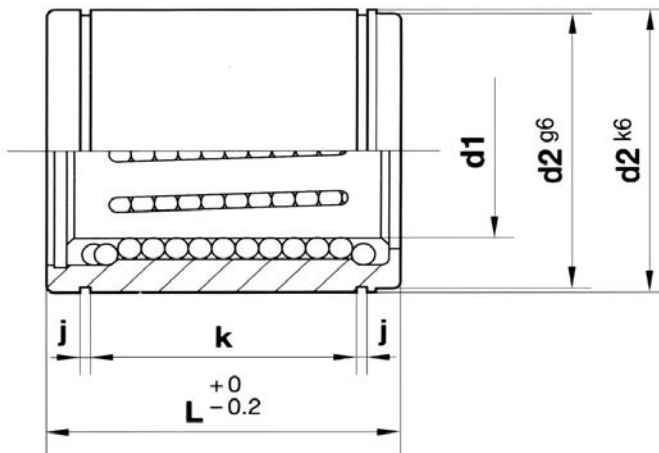
**Materials:** Special steel bush. Bronze cage with high resistance to wear.  
High-precision balls. Hardness: 60-62 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.





## BUSH REF. 803



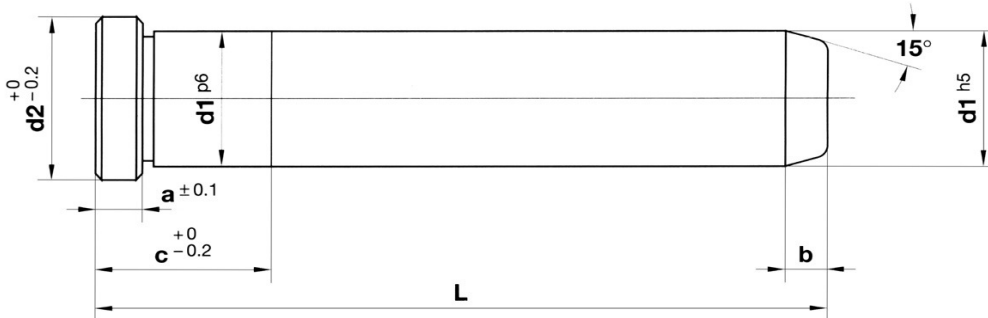
BOLEXP 803							
d1	L	d2	k	j	Ø ball	Number of lines	Item code
12	30	24	20	1,3	3	5	B8031230
16	30	28	19	1,6	3	6	B8031630
16	35	28	24	1,6	3	6	B8031635
20	35	32	24	1,6	3	6	B8032035
20	45	32	34	1,6	3	6	B8032045
25	35	40	23	1,8	3	8	B8032535
25	45	40	33	1,8	3	8	B8032545
25	55	40	43	1,8	3	8	B8032555
32	45	50	33	2,1	4	8	B8033245
32	63	50	51	2,1	4	8	B8033263
40	45	60	33	2,1	4	8	B8034045
40	63	60	51	2,1	4	8	B8034063
50	63	70	50	2,6	4	10	B8035063
50	80	70	65	2,6	4	10	B8035080
60	80	85	65	3,1	4	12	B8036080
60	100	85	85	3,1	4	12	B80360100

**Materials:** Special steel bush. Bronze cage with high resistance to wear.  
High-precision balls. Hardness: 60-62 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.



## COLUMN REF. 808



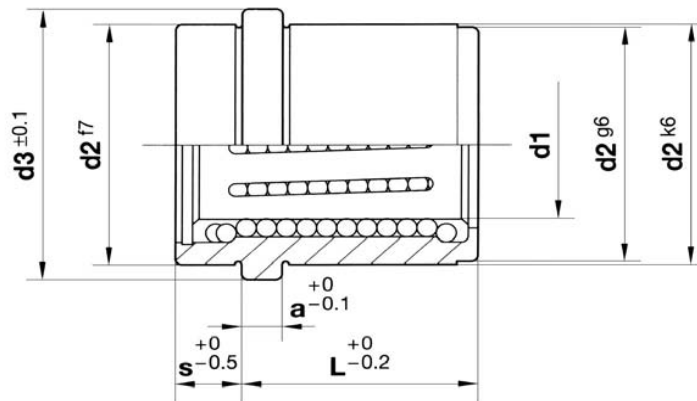
BOLEXP 808						
d1	L	d2	a	b	c	Item code
8	60	12	3	4	10	B80808060
8	80	12	3	4	10	B80808080
8	100	12	3	4	10	B80808100
10	60	14	4	4	12	B80810060
10	80	14	4	4	12	B80810080
10	100	14	4	4	12	B80810100
12	80	16	4	4	16	B80812080
12	100	16	4	4	16	B80812100
12	125	16	4	4	16	B80812125
16	80	20	6	6	20	B80816080
16	100	20	6	6	20	B80816100
16	125	20	6	6	20	B80816125
16	160	20	6	6	20	B80816160
16	200	20	6	6	20	B80816200
20	100	24	6	6	22	B80820100
20	125	24	6	6	22	B80820125
20	160	24	6	6	22	B80820160
20	200	24	6	6	22	B80820200
20	250	24	6	6	22	B80820250
25	125	30	6	6	25	B80825125
25	160	30	6	6	25	B80825160
25	200	30	6	6	25	B80825200
25	250	30	6	6	25	B80825250
25	315	30	6	6	25	B80825315
32	125	37	8	8	35	B80832125
32	200	37	8	8	35	B80832200
32	250	37	8	8	35	B80832250
32	315	37	8	8	35	B80832315
40	125	45	8	8	35	B80840125
40	200	45	8	8	35	B80840200
40	250	45	8	8	35	B80840250
40	315	45	8	8	35	B80840315
40	400	45	8	8	35	B80840400
50	315	55	10	10	45	B80850315
50	400	55	10	10	45	B80850400
60	315	65	10	10	55	B80860315
60	400	65	10	10	55	B80860400

**Materials:** Steel 5732. Hardness: 62-64 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.



## **BUSH REF. 812**



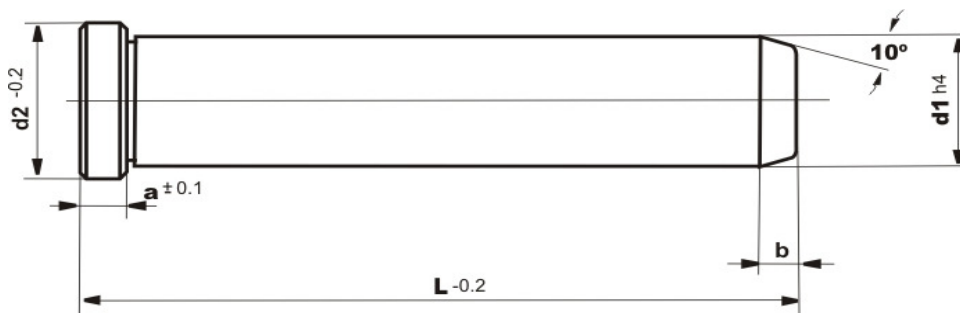
<b>BOLEXP 812</b>								
<b>d1</b>	<b>L</b>	<b>d2</b>	<b>d3</b>	<b>a</b>	<b>s</b>	<b>Ø bola</b>	<b>Number of lines</b>	<b>Item Code</b>
12	20	22	26	6	6	2,5	6	<b>B8121226</b>
18	24	30	35	6	11	3	6	<b>B8121835</b>
24	29	38	43	6	16	3	8	<b>B8122445</b>
30	34	46	52	6	21	4	8	<b>B8123055</b>

**Materials:** Special steel bush. Bronze cage with high resistance to wear.  
High-precision balls. Hardness: 60-62 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.



## COLUMN REF. 818



BOLEXP 818					
d1	L	d2	a	b	Item Code
12	80	16	4	4	B81812080
12	100	16	4	4	B81812100
12	120	16	4	4	B81812120
12	140	16	4	4	B81812140
18	100	22	6	7	B81818100
18	120	22	6	7	B81818120
18	140	22	6	7	B81818140
18	160	22	6	7	B81818160
18	200	22	6	7	B81818200
24	160	28	6	7	B81824160
24	200	28	6	7	B81824200
24	240	28	6	7	B81824240
24	300	28	6	7	B81824300
30	160	36	6	7	B81830160
30	200	36	6	7	B81830200
30	240	36	6	7	B81830240
30	300	36	6	7	B81830300

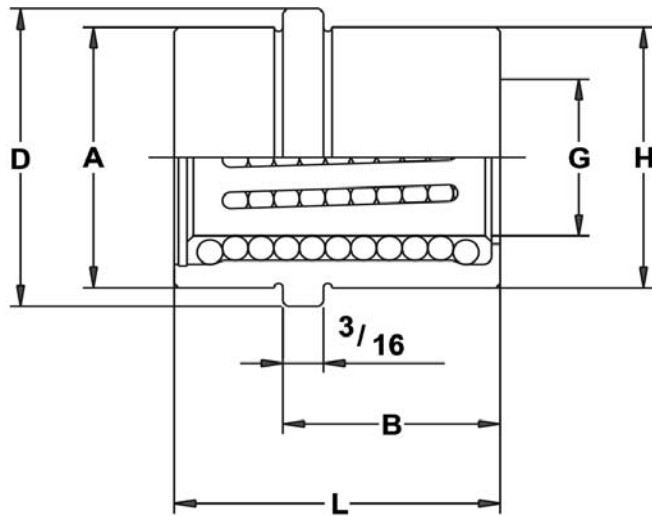
**Materials:** Steel 5732. Hardness: 62-64 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.



## BALL GUIDED EJECTION BUSHINGS

### INCH SIZES



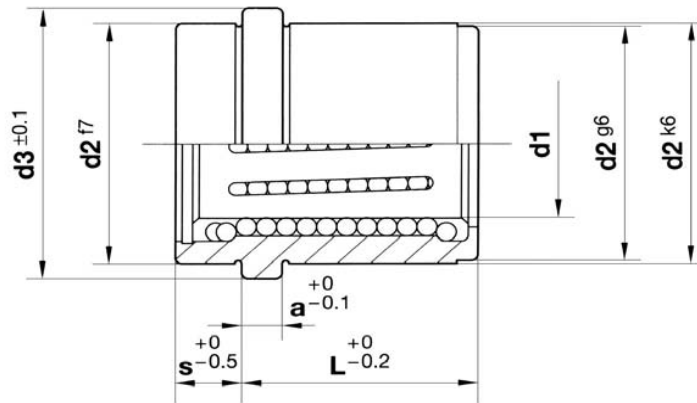
<b>BOLEXP INCH SIZES</b>							
NOM. I.D.	G	H	A	D	L	B	CATALOG NUMBER
3/4	0.751	$\begin{smallmatrix} +.0005 \\ -.0000 \end{smallmatrix}$	$\begin{smallmatrix} +.000 \\ -.001 \end{smallmatrix}$	$\begin{smallmatrix} +.000 \\ -.030 \end{smallmatrix}$	$\begin{smallmatrix} +.000 \\ -.030 \end{smallmatrix}$	$\begin{smallmatrix} +.000 \\ -.030 \end{smallmatrix}$	<b>BGEB0750</b>
7/8	0.876	1.3755	1.3740	1.552	1.75	1.12	<b>BGEB0875</b>
1"	1.001	1.6255	1.6240	1.802	1.75	1.12	<b>BGEB1000</b>
1-1/4	1.251	2.0005	1.9990	2.177	1.75	1.12	<b>BGEB1250</b>
1-1/2	1.501	2.5005	2.4990	2.687	2.25	1.62	<b>BGEB1500</b>

**Materials:** Special steel bush. Bronze cage with high resistance to wear.  
High-precision balls. Hardness: 60-62 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.



## BUSH REF. 852 (stainless steel)



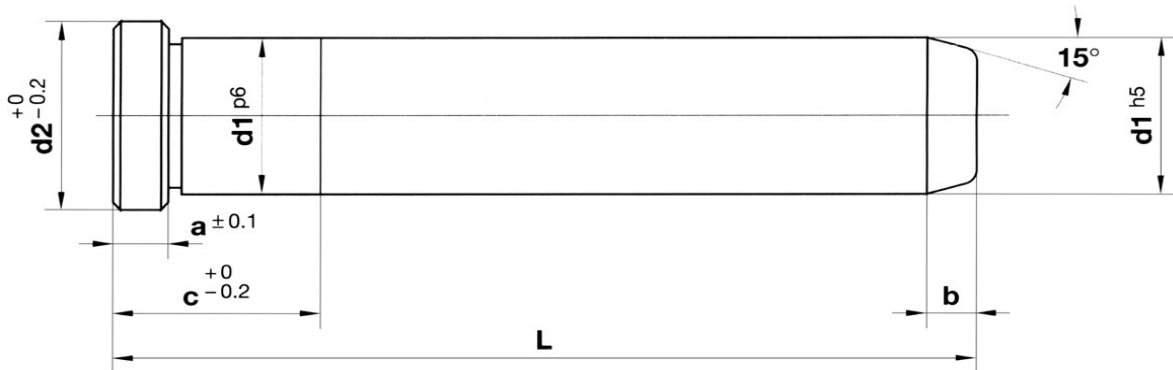
BOLEXP 852								
d1	L	d2	d3	a	s	Ø bola	Number of lines	Item Code
12	22	24	28	6	8	3	5	B8521222
16	22	30	32	6	8	3	6	B8521622
20	26	32	36	6	9	3	6	B8522026
25	26	40	45	6	9	3	8	B8522526

**Materials:** Stainless steel bush 1.2083.  
Anodized aluminium cage  
High-precision balls stainless steel,  
Hardness: 54-56 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.



## COLUMN REF. 858 (stainless steel)



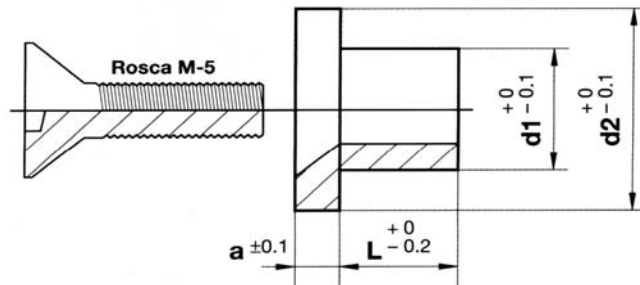
<b>BOLEXP 858</b>						
<b>d1</b>	<b>L</b>	<b>d2</b>	<b>a</b>	<b>b</b>	<b>c</b>	<b>Item code</b>
12	80	16	4	4	16	<b>B85812080</b>
12	100	16	4	4	16	<b>B85812100</b>
16	100	20	6	6	20	<b>B85816100</b>
16	125	20	6	6	20	<b>B85816125</b>
20	125	24	6	6	22	<b>B85820125</b>
20	160	24	6	6	22	<b>B85820160</b>
25	160	30	6	6	25	<b>B85825160</b>
25	200	30	6	6	25	<b>B85825200</b>

**Materials:** 1.4125 Hardness: 58-60 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.



## CLAMP



CLAMP				
L	a	d1	d2	Item code
6	3	9	13	B6
8	3	9	15	B8

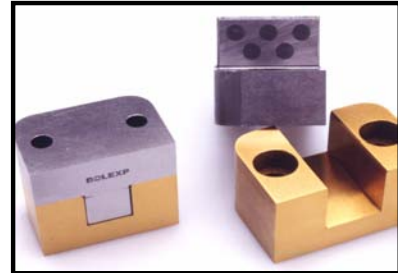
**Materials:** Special steel. Hardness: 60 HRc.

Please ask for other diameters and lengths different to the ones included in this catalogue.





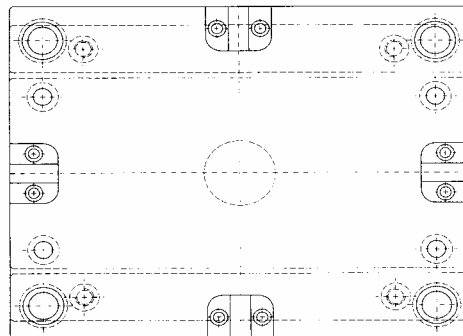
## MOULD CENTERERS



All our range of centerers that we present in this catalogue edition include graphite insertions in order to self-lubricate its working in one of the pieces, the other one being coated with a TiN treatment at 2300 Hv for reducing seizing.

Side centerers make it possible to guarantee the appropriate alignment for the main plates in the mould.

The fact of making the allocations in the mould bearer axis allows us to ensure the zero point of the whole structure.



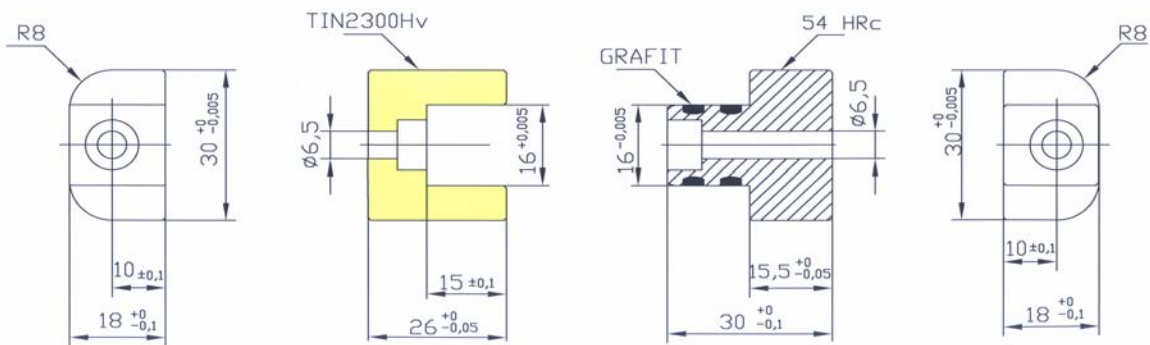
The fact of making the allocations in the mould bearer axis allows us to ensure the zero point of the whole structure.

The flat centerer keeps the axis invariable where it is located as well as absorbs the +B27 longitudinal dilatations of that axis.

The system of fixing to plate of our centerers allows to make all the mechanization of plates, figure allocations and centering system in a single operation, which guarantees a greater precision of execution.

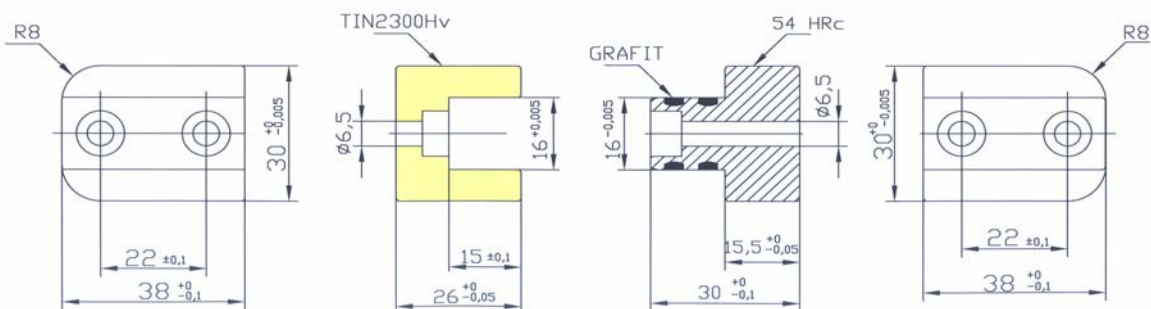


## CENTERER REF. 503018



**Materials:** Steel 1.2344 at 54HRc. + graphite and TiN 2300Hv.

## CENTERER REF. 503038

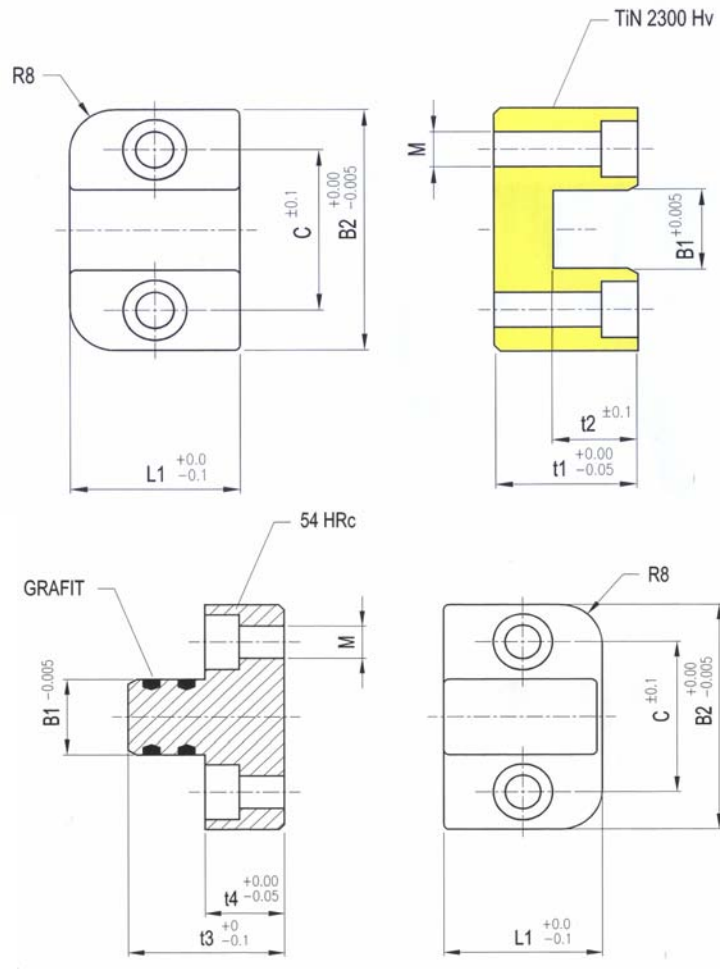


**Materials:** Steel 1.2344 at 54 HRc. + graphite and TiN 2300 Hv.

Please contact us for any measures different to those included in the catalogue.



## CENTERER REF. 505



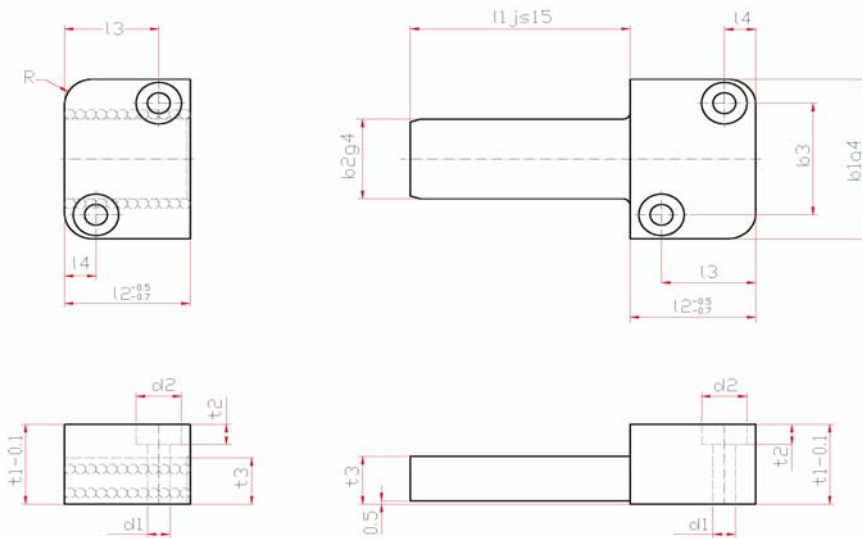
<b>BOLEXP REF. 505</b>									
B1	B2	L1	C	t1	t2	t3	t4	M	Item code
11	35	26	23	25	15	29,5	15	M5	CL505035
15	45	30	30	25	15	29,5	15	M6	CL505045
20	55	36	37,5	30	20	39,5	20	M8	CL505055
30	75	36	52	35	25	44,5	20	M10	CL505075

**Materials:** Steel 1.2344 at 54 HRc. + graphite and TiN 2300 Hv.

**Please contact us for any measures different to those included in the catalogue.**



## CENTERER REF. 507



BOLEXP REF. 507													
b1	b2	b3	l1	l2	l3	l4	d1	d2	t1	t2	t3	R	Item code
45	12	29	25	27	19	11	6.3	11	22	6.8	14	6	CL507045025
			50										CL507045050
50	17	35	32	36	27	11	6.3	11	25	6.8	15	8	CL507050032
			63										CL507050063
63	25	45	40	46	35	13	8.5	15	32	9	20	8	CL507063040
			80										CL507063080
85	35	60	50	56	40	15	10.5	18	36	11	23	10	CL507085050
			100										CL507085100
100	45	74	56	66	48	18	13	20	40	13	25	10	CL507100056
			112										CL507100112

**Materials:** 1.2379 Hardness 60-62 HRc.  
Cover: 1.2311 Black oxide finish- + High precision balls

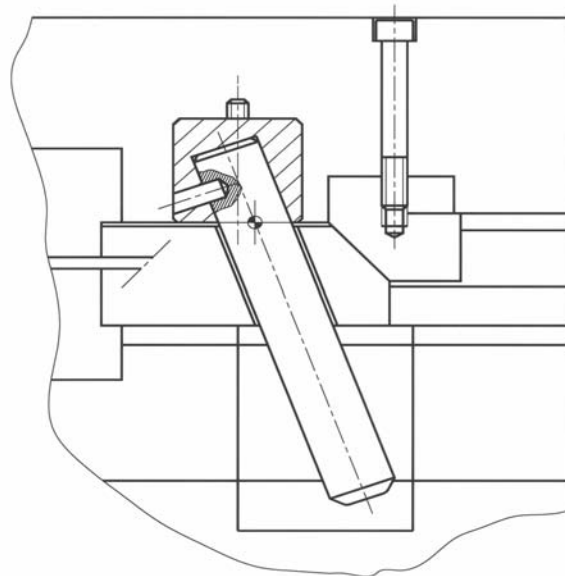
**Please contact us for any measures different to those included in the catalogue.**



## INCLINED ASSEMBLY

During the years of experience in the injection mould sector mechanizations, we have detected the need of products which are able to agilize its mechanization; because of this fact, and given the complexity of making the tilted columns in moulds, we have decided to manufacture these tilted assemblies.

Our standard system allows us to have in stock and ready for immediate delivery an amount of 140 models, with which we expect to greatly cover the existing needs.



The assembly consists of a support in 1.2312 material screwed into the allocation previously made in the mould plate with 2 conical screws fixing and aligning the position of the tilted column out of the support.

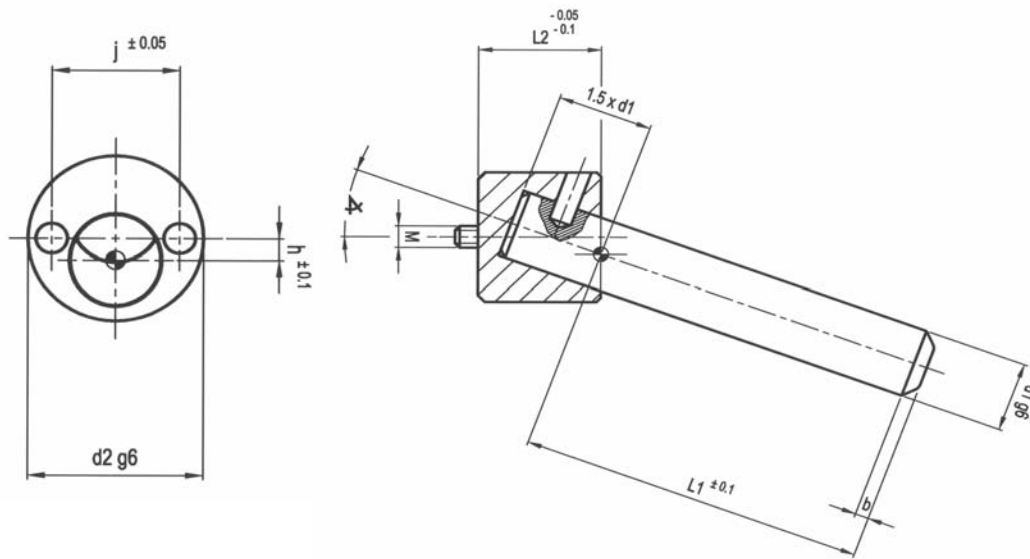
Mounting and unmounting operations are made through the front side of the plate, which makes it easy to exchange, when needed. The allocations to make on plates are always straight, so improving its mechanization agility.

By using the BOLEXP tilted assembly, we keep free the down side of the plate through which we can make cooling circuits without interferences.



## INCLINED ASSEMBLY REF. CI

7° - 10° - 12° - 15° - 18° - 20° - 22°



ALL OF THE BENCH MARKS IN THE DIMENSION TABLE ARE VALID FOR ANY OF THE AVAILABLE DEGREES: 7°, 10°, 12°, 15°, 18°, 20° AND 22°

INCLINED ASSEMBLY CI																
d1	d2	L2	j	h	b	M	L1									
							50	75	100	125	150	175	200	250		
12	24	22	17,5	2,5	4	4	●	●	●	●						
16	30	28	22,5	3	6	5		●	●	●	●					
20	38	36	28	4	6	6			●	●	●	●				
25	48	45	36	5	6	8				●	●	●	●			
30	58	55	43	6	8	10					●	●	●	●		●

**Way of order:** CI + Angle + Ø Column + Column Length L1

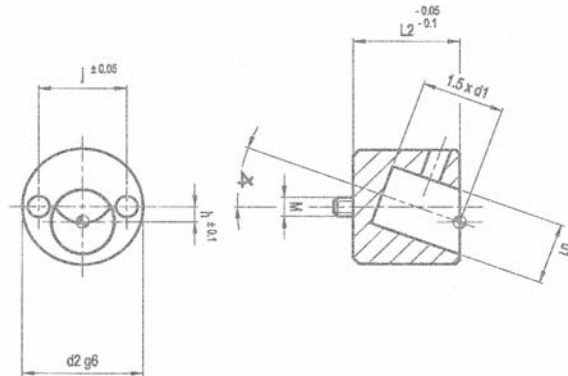
**Materials:** Base support 1.2312, Column 1.5732 58-60 HRC, Screw 12-9

Please ask for other diameters and lengths different to the ones included in this catalogue.



## TILTED COLUMN SUPPORT

7° - 10° - 12° - 15° - 18° - 20° - 22°



CS SUPPORT					
d1	d2	L2	j	h	M
12	24	22	17,5	2,5	4
16	30	28	22,5	3	5
20	38	36	28	4	6
25	48	45	36	5	8
30	58	55	43	6	10

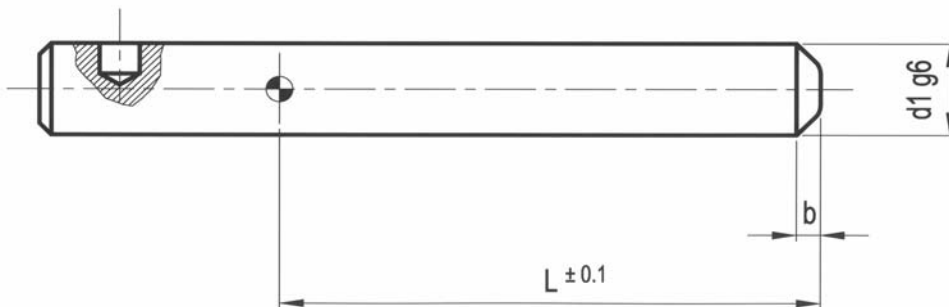
ALL OF THE BENC MARKS IN THE DIMENSION TABLE ARE VALID FOR ANY OF THE AVAILABLE DEGREES: 7°, 10°, 12°, 15°, 18°, 20° Y 22°

Way of order: CS + Angul + Ø Column

Materials: Base support 1.2312, Column 1.5732 58-60 HRc, Screw 12-9

Please ask for other diameters and lengths different to the anes included in this catalogue.

## TILTED COLUMN CP



TILTED COLUMN CP		L1							
d1	b	50	75	100	125	150	175	200	250
12	4	●	●	●	●				
16	6		●	●	●	●			
20	6			●	●	●	●		
25	6				●	●	●	●	
30	8					●	●	●	●

Way of order: CP + Ø Column + Length column L1

Materials: 1,5732 58-60 HRc

Please ask for other diameters and lengths different to the anes included in this catalogue.



## **SELF-LUBRICATED BRONZE**

The development of self-lubricated guidance systems arises from the need to solve the existing problems involved in lubrication. These are due either to the difficulty of access or to the convenience of continuous and permanent lubrication, which oils fail to ensure.

Implementing these systems results in a significant reduction in seizing problems and maintenance costs, as well as in gas emission caused by oil heating. This permits to operate at high temperatures that in some cases can reach 400° C (752° F).

The presence of aluminium in bronze reduces the attack of atmospheric agents and warm gases, whilst at the same time exhibiting great stability against distilled water, saline water, seawater or acid well water. Bleaches, except for ammonia, are harmless to it. Moreover, a protection layer produced by the material itself acts very favourably against the corrosive effect of sulphur and oxidizing gases.

Graphite insertions, acting as a solid lubricant, allow to keep an excellent level of lubrication for plates or bushes through all their lifetime, ready for use at any time. Through use, the bronze structure wear causes graphite insertions wear. The graphite dust resulting from this slight wear will be the responsible for lubricating the whole of the contact area.

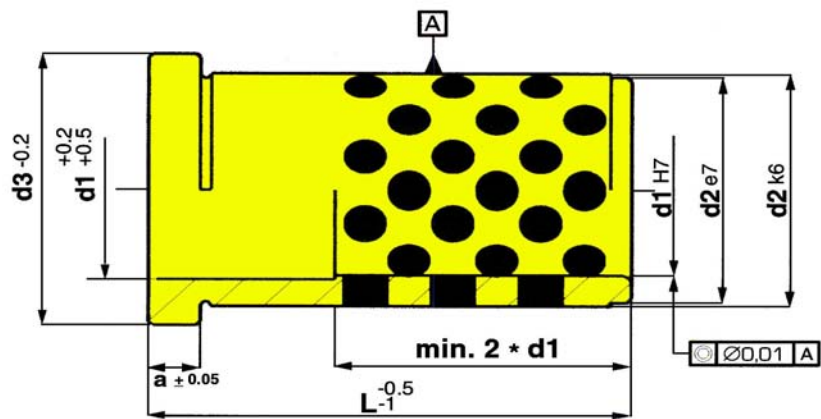
The graphite used is a material with an extremely low chemical-inertia level, not interacting with most elements in nature under normal conditions. This ensures regular behaviour through the piece lifetime without unexpected contingency.

BOLEXP item construction exhibits a graphite distribution over the guide surface of about 25%-35% of the total, thus guaranteeing proper lubrication of the tool to construct. In addition, the graphite insertions used are relatively small, in comparison with other manufacturers, in order to minimize the impact on bronze bush consistency and maximize the dispersal of solid lubricant.





## BUSH REF. 311



sense of motion

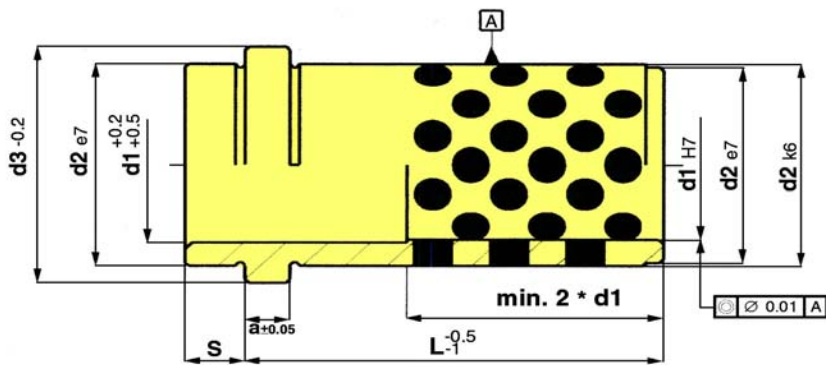
BOLEXP 311														
d1	d2	d3	a	L										
				12	17	22	27	36	46	56	66	76	86	96
9	14	16	3	●	●	●	●	●	●	●				
10	14	16	3	●	●	●	●	●	●	●				
12	18	23	6		●	●	●	●	●	●				
14	20	25	6		●	●	●	●	●	●				
15	20	25	6		●	●	●	●	●	●				
16	22	27	6		●	●	●	●	●	●				
18	26	31	6		●	●	●	●	●	●	●	●		
20	26	31	6		●	●	●	●	●	●	●	●		
22	30	35	6			●	●	●	●	●	●	●	●	
24	30	35	6			●	●	●	●	●	●	●	●	
30	42	47	6				●	●	●	●	●	●	●	●
32	42	47	6				●	●	●	●	●	●	●	●
40	54	60	10					●	●	●	●	●	●	●
42	54	60	10					●	●	●	●	●	●	●

**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please ask for other diameters and lengths different to the ones included in this catalogue.



## BUSH REF. 312



sense of motion

BOLEXP 312																
d1	d2	d3	S	a	L											
					17	22	27	36	46	56	66	76	86	96	116	136
9	14	16	5	3	●	●	●	●	●	●	●					
10	14	16	5	3	●	●	●	●	●	●	●					
14	20	25	6	6	●	●	●	●	●	●	●	●				
15	20	25	6	6	●	●	●	●	●	●	●	●				
18	26	31	8	6	●	●	●	●	●	●	●	●				
20	26	31	8	6	●	●	●	●	●	●	●	●				
22	30	35	8	6		●	●	●	●	●	●	●	●	●		
24	30	35	8	6		●	●	●	●	●	●	●	●	●		
30	42	47	8	6			●	●	●	●	●	●	●	●	●	
32	42	47	8	6			●	●	●	●	●	●	●	●	●	
40	54	60	10	10				●	●	●	●	●	●	●	●	●
42	54	60	10	10				●	●	●	●	●	●	●	●	●

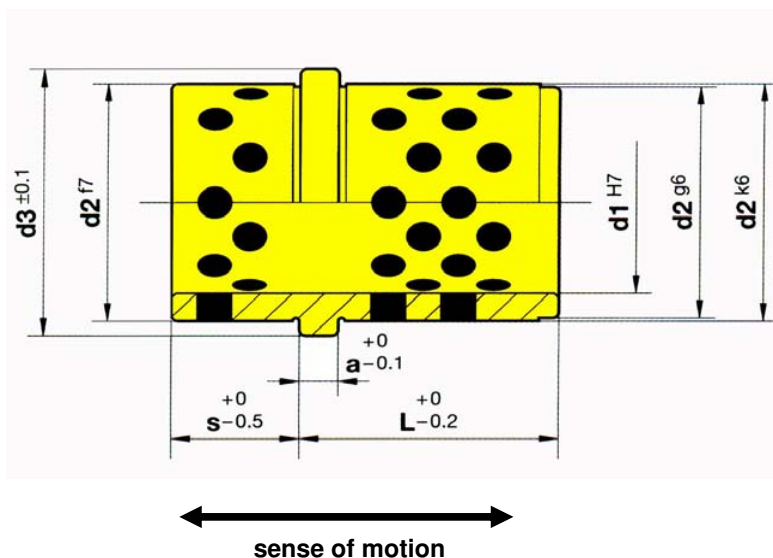
Form of order: G312 + d1 + L

Materials: Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please ask for other diameters and lengths different to the ones included in this catalogue.



## BUSH REF. 313



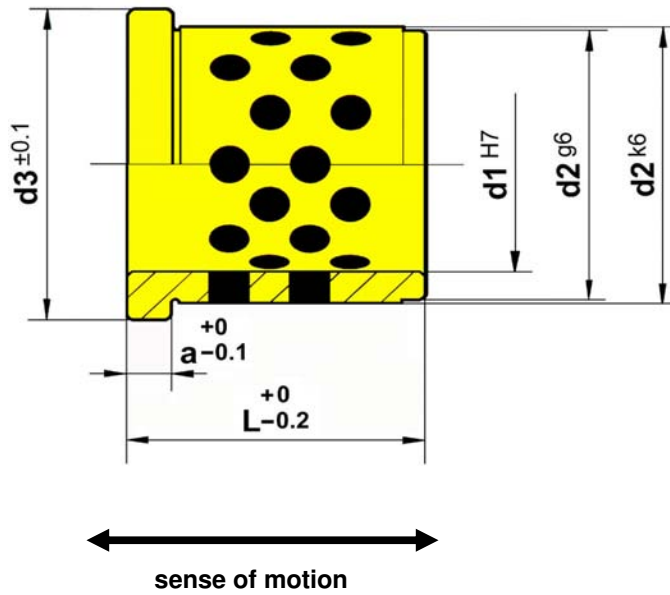
BOLEXP 313						
d1	L	d2	d3	a	S	Item code
14	17	20	25	6	9	G3131417
15	17	20	25	6	9	G3131517
18	22	26	31	6	17	G3131822
20	22	26	31	6	17	G3132022
22	27	30	35	6	22	G3132227
24	27	30	35	6	22	G3132427
30	36	42	47	6	27	G3133036
32	36	42	47	6	27	G3133236

**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please ask for other diameters and lengths different to the ones included in this catalogue.



## BUSH REF. 401



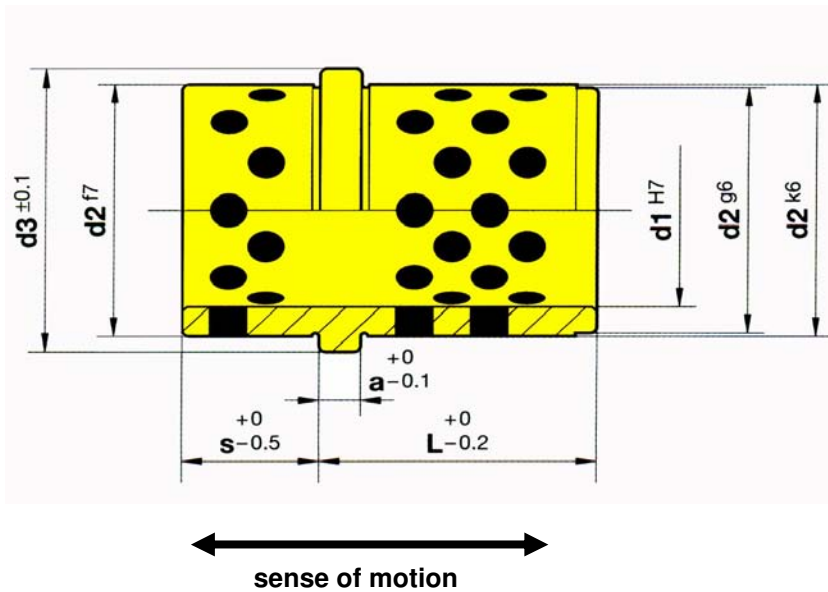
BOLEXP 401					
d1	L	d2	d3	a	Item code
20	26	28	32	6	G4012026
20	35	28	32	6	G4012035
25	26	32	36	6	G4012526
25	35	32	36	6	G4012535
25	45	32	36	6	G4012545
32	35	40	45	8	G4013235
32	45	40	45	8	G4013245
40	45	50	56	8	G4014045

**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please ask for other diameters and lengths different to the ones included in this catalogue.



## BUSH REF. 402



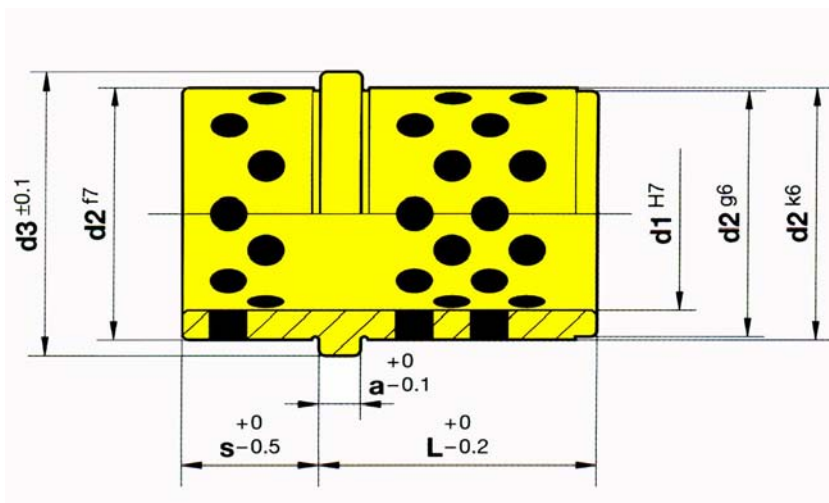
BOLEXP 402						
d1	L	d2	d3	a	S	Item code
12	22	18	22	6	9	G4021222
16	22	22	26	6	12	G4021622
16	26	22	26	6	12	G4021626
20	26	28	32	6	15	G4022026
20	35	28	32	6	15	G4022035
25	26	32	36	6	18	G4022526
25	35	32	36	6	18	G4022535
25	45	32	36	6	18	G4022545
32	35	40	45	8	20	G4023235
32	45	40	45	8	20	G4023245
40	45	50	56	8	25	G4024045
40	63	50	56	8	25	G4024063

**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please ask for other diameters and lengths different to the ones included in this catalogue.



## BUSH REF. 403



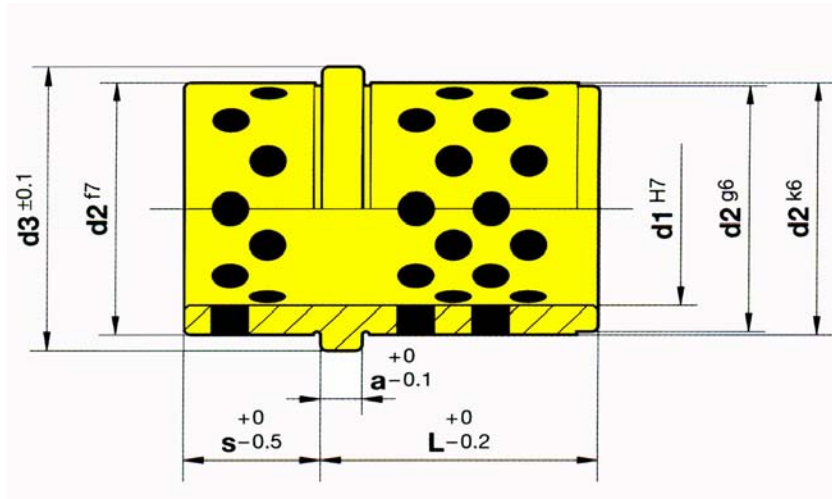
BOLEXP 403							
D1	D2	D3	L+S	L	S	a	Item code
12	18	22	32	16	16	5	G4031232
14	20	24	32	16	16	5	G4031432
16	22	26	32	16	16	5	G4031632
18	26	30	32	16	16	5	G4031832
20	28	32	32	16	16	6	G4032032
25	34	38	32	16	16	7	G4032532
32	40	45	50	25	25	7	G4033250
40	48	52	65	33	32	8	G4034065

**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please contact us for any measures different to those included in the catalogue.



## BUSH REF. 404



↔  
sense of motion

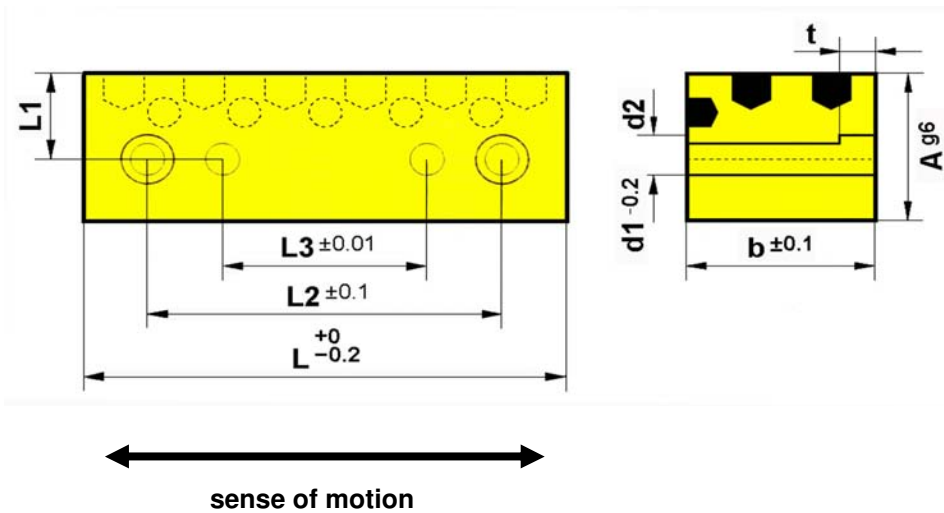
BOLEXP 404						
d1	L	d2	d3	a	S	Item code
12	17	16	20	4	8	G4041217
16	17	20	24	4	12	G4041617
16	21	20	24	4	12	G4041621
18	21	25	30	6	17	G4041821
18	26	25	30	6	17	G4041826
20	26	30	35	6	17	G4042026
22	21	30	35	6	17	G4042221
22	26	30	35	6	17	G4042226
25	26	35	40	8	18	G4042526
25	35	35	40	8	18	G4042535
30	35	40	45	8	21	G4043035

**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please contact us for any measures different to those included in the catalogue.



## GUIDE STRIP REF. 405



BOLEXP 405									
A	b	L	L1	L2	L3	d1	d2	t	Item code
20	15	63	13	47	25	6	6,5	6,5	G40515063
20	15	300							G40515300
20	20	63	13	47	25	6	6,5	6,5	G40520063
20	20	80	13	64	40	6	6,5	6,5	G40520080
20	20	100	13	84	60	6	6,5	6,5	G40520100
20	20	300							G40520300
25	25	100	16	80	50	8	8,5	8,5	G40525100
25	25	125	16	105	75	8	8,5	8,5	G40525125
25	25	300							G40525300
25	30	125	16	105	75	8	8,5	8,5	G40530125
25	30	160	16	140	110	8	8,5	8,5	G40530160
25	30	300							G40530300

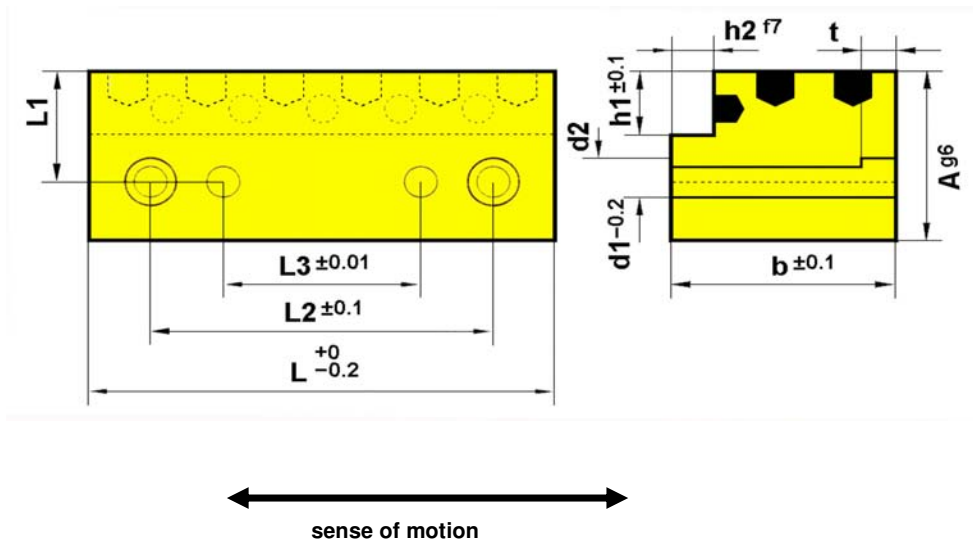
**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please contact us for any measures different to those included in the catalogue.





## GUIDE STRIP REF. 406



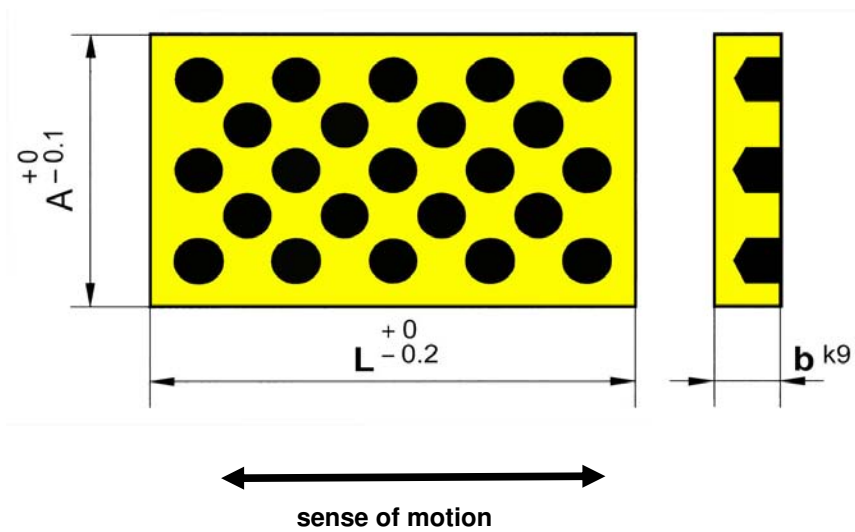
BOLEXP 406											
A	b	L	L1	L2	L3	d1	d2	t	h1	h2	Item code
20	20	63	13	47	25	6	6,5	6,5	6	5	G40620063
20	25	63	13	47	25	6	6,5	6,5	6	5	G40625063
20	25	80	13	64	40	6	6,5	6,5	6	5	G40625080
20	25	100	13	84	60	6	6,5	6,5	6	5	G40625100
25	31	100	16	80	50	8	8,5	8,5	7	6	G40631100
25	31	125	16	105	75	8	8,5	8,5	7	6	G40631125
25	38	125	16	105	75	8	8,5	8,5	7	8	G40638125
25	38	160	16	140	110	8	8,5	8,5	7	8	G40638160

**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please contact us for any measures different to those included in the catalogue.



## SLID PLATE REF. 407



<b>BOLEXP 407</b>			
<b>A</b>	<b>L</b>	<b>b</b>	<b>Item code</b>
20	63	5	<b>G40720063</b>
20	300	6	<b>G40720300</b>
25	63	5	<b>G40725063</b>
25	80	5	<b>G40725080</b>
25	300	6	<b>G40725300</b>
30	80	6	<b>G40730080</b>
30	100	6	<b>G40730100</b>
30	300	6	<b>G40730300</b>
40	80	6	<b>G40740080</b>
40	100	6	<b>G40740100</b>
40	125	6	<b>G40740125</b>
40	300	6	<b>G40740300</b>

**Materials:** Bronze EN1982 CuAl10Fe5Ni5C + Graphite

Please contact us for any measures different to those included in the catalogue.

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**BOLEXP**

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