

STANDARD GRADES	BRONZE BP 25	Iron Alloy FP20	Iron Alloy SO16 <i>Blanks only</i>
Similar to AFNOR SINT A50	C-T10-K140 A50	F-00C2-K200 A10	HORS NORME
Min. density (g/cm <sup>3</sup> )	6,2	5,6	6
Max. pressure (daN/cm <sup>2</sup> )	100	225	600
Max. lineare speed (m/s)	6	4	0,3
Max. PV hydrodinamic conditions (Vmini 0,5 m/s) daN/cm <sup>2</sup> xm/s	18	18	9
Temperature range	-5/+90	-5/+90	-5/+105
Impregnation oil	MT100	MT100	METADOP
Min. apparent porosity (%)	23	20	16

CHOICE OF THE GRADE

Bronze BP 25	Iron Alloy FP20	Iron Alloy SO16 <i>Blanks only</i>
good coefficient de friction	recommended for medium or low speeds	Recommended for high load, low speed
good corrosive resistance	good seizure resistance	Very good seizure resistance
Recommended for high speeds, low load and frequent starting up		
finish surface Ra ≤ 0,6	Surface finish Ra ≤ 0,3	Surface finish Ra ≤ 0,3
Shaft hardness ≥ 80 kg/mm <sup>2</sup>	Shaft hardness ≥ 120 kg/mm <sup>2</sup>	Shaft hardness ≥ 120 kg/mm <sup>2</sup>

SOLID LUBRICATING

Designation	Max speed (m/s)	LOAD Max (m/s)	Load x speed (daN/cm <sup>2</sup> x m/s)	Temperature range (°C)	Load at V=0 (daN/cm <sup>2</sup> )	Shaft	
						Ra max	HB mini
BP25 + PTFE	1	100	3	- 180 / + 180	200	0,3	240
FP20 + PTFE	1	225	3	- 180 / + 180	450	0,3	300
BP25 + MoS <sub>2</sub>	0,1	225	1	- 180 / + 300	200	0,3	355
FP20 + MoS <sub>2</sub>	0,1	100	1	- 180 / + 300	450	0,3	355
BG10 à 5% graphite	0,1	60	1	- 180 / + 250	120	0,3	355

OUT OF STANDARD SIZES AND SPECIFIC OILS

- ✓ For small quantities, our partner can propose you machined parts which allow ux to realize you
- ✓ For important and repetitive batch, we can propose a special tooling. Please consult us.
- ✓ To optimize your materials we can propose bearing with specific shape corresponding to your special applications. Please consult us.

**High load, low speed**

(rolling mill, press, pulley, block, shock, civil engineering machines)

A stock of blanks in SO16 and TR16 grade with standard sizes (see our brochure "Grades" ref CN2008E).

**High or low temperature**

In case of temperature outside the limits of -5/+90°C the impregnation lubricant can be adapted.

**Bearings immersed, corrosive environment protection**

Refer to paragraph "SOLID LUBRICATING"

**Impregnation with oil adapted to the requirements of FDA norm.**

ASSEMBLING

Please refer to datasheets ref "ASSEMBLING ADVICE" **METAFRAM®** ref CR2008E.  
Please contact us to obtain it.

Using advice



- Our products must be wrapped in plastic bag.
- Keep the products in their original wrapping.
- Do not store on absorbent supports.

- Do not shocks neither the packaging nor products.
- Spattered and contacts with water are forbidden.
- Do not use again after removal.

A large stock of **METAFRAM®** self-lubricating bearings is available with in 24 hours thanks to an international distribution network

**FEDERAL MOGUL**  
**METAFRAM®**

Your bushings and bearing of reference

**FEDERAL MOGUL**  
Sintertech

Sales Department  
60/62, rue Danjou  
92517 Boulogne Billancourt  
Tél. : +33 (0)5 59 36 30 02  
Fax. : +33 (0)1 46 94 27 02

**METAFRAM®**

CERTIFICATION  
SYSTEMES QUALITE  
ISO 9001 2000  
ISO TS 16949 2002  
ISO 14001  
OSHA 18001

# SELF LUBRICATING FLANGED BEARINGS

METRIC STANDARD  
IN STOCK **METAFRAM®**

## Flanged bushings-FP20 iron alloy base

Inside Ø mm (Ø1)	Outside Ø mm (Ø2)	Flange		Bearing Length (L)
		Outside Ø mm (Ø3)	Thickness mm (e)	
C3	6	9	1,5	4
C6	10	14	2	6-10-16
C8	12	16	2	8-12-16
C10	15	20	2,5	10-16-20
C12	15	18	1,5	12-16-20
C12	17	22	2,5	12-16
C14	18	22	2	14-18-22
C16	20	24	2	16-20
C16	22	28	3	16-20-25
C18	24	30	3	18-22

Inside Ø mm (Ø1)	Outside Ø mm (Ø2)	Flange		Bearing Length (L)
		Outside Ø mm (Ø3)	Thickness mm (e)	
C20	24	28	2	16-20-25
C20	26	32	3	16-20-25
C22	29	36	3,5	18-22-28-36
C25	30	35	2,5	20-32
C25	32	39	3,5	25-32
C30	38	46	4	30
C32	40	48	4	20-32
C36	45	54	4,5	22-36
C40	50	60	5	25-32-40
C50	60	70	5	50
C60	70	80	5	60

Tolerance in microns

## Flanged bushings-BP25 Bronze base

Inside Ø mm (Ø1)	Outside Ø mm (Ø2)	Flange		Bearing Length (L)
		Outside Ø mm (Ø3)	Thickness mm (e)	
C3	6	9	1,5	4-6-10
C4	8	12	2	4-8-12
C6	10	14	2	6-10-16
C8	12	16	2	8-12-16
C9	14	19	2,5	6-10-14
C10	13	16	1,5	10-16-20
C10	15	20	2,5	10-16-20
C10	16	22	3	8-10-16
C12	15	18	1,5	12-16-20
C12	17	22	2,5	12-16-20-25
C12	18	24	3	8-12-20
C14	18	22	2	14-18-22
C14	20	26	3	14-18-22
C14	20	26	3	14-18-22-28
C15	19	23	2	16-20-25
C15	21	27	3	16-20-25-32
C16	22	28	3	16-20-25-32
C18	22	26	2	18-22-28
C18	24	30	3	18-22-28
C20	24	28	2	16-20-25

Inside Ø mm (Ø1)	Outside Ø mm (Ø2)	Flange		Bearing Length (L)
		Outside Ø mm (Ø3)	Thickness mm (e)	
C20	26	32	3	16-20-25-32
C22	27	32	2,5	18-22-28
C22	28	34	3	15-20-25-30
C22	29	36	3,5	18-22-28-36
C25	30	35	2,5	20-25-32
C25	32	39	3,5	20-25-32
C28	33	38	2,5	22-28-36
C28	36	44	4	22-28-36
C30	38	46	4	20-25-30
C32	38	44	3	20-25-32
C32	40	48	4	20-25-30-32
C36	42	48	3	22-28-36
C36	45	54	4,5	22-28-36
C40	46	52	3	25-32-40
C40	50	60	5	25-32-40
C45	51	57	3	28-36-45
C45	56	67	5,5	28-36-45
C50	56	62	3	32-40-50
C50	60	70	5	32-40-50
C60	70	80	5	50-60

Tolerance in microns

### Tolerances

**Bearings before assembling**  
 Inside Ø - Ø1  
 Outside Ø - Ø2  
 Length - L > 10  
 Length - L ≤ 10  
 Flange : Ø ext. - Ø3  
 Thickness : e

**Concentricity tolerance Ø1 Ø2**  
 Distance from max. readings for one complete lap of the bearing fitted on a mandrel.  
 Inside Ø ≤ 20  
 Inside Ø 20 < a ≤ 35  
 Inside Ø > 35

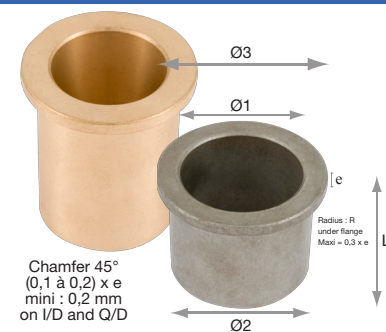
Tolerance F8  
 Tolerance s8  
 Tolerance ± 1%  
 Tolerance ± 0,10 mm  
 Tolerance js13  
 Tolerance js14

Tolerance 60µm  
 Tolerance 80µm  
 Tolerance 100µm

### Designation

Flange bearing I/D 22 - O/D 29 - L 36 is designed by :  
 - It **METAFRAM®** Grade BP25 (or FP20)  
 - It dimensions C22/29x36 ("C" for flange bearing)

Grades' choice and characteristics in sheet 5



# SELF-LUBRICATING CYLINDRICAL BEARINGS

METRIC STANDARD  
IN STOCK **METAFRAM®**

## Cylindrical bushings-FP20 iron alloy base

Inside Ø mm (Ø1)	Outside Ø mm (Ø2)	Bearing Length (L)
3	6	4-10
4	8	8
6	9	6-10-12-16
6	10	6-10-16
6	12	6
8	11	8-12-16
8	12	8-12-16-20
10	13	10-20-25
10	14	10-16-20
10	15	10
12	15	12-16-20
12	16	12-16-20-25
12	17	12
14	18	14-18-22

Inside Ø mm (Ø1)	Outside Ø mm (Ø2)	Bearing Length (L)
14	20	14-28
15	19	16-20
16	22	16-20-25-32
16	20	16-20-25
18	22	18-22
18	24	22
20	24	16-20-25-32
20	26	16-20-25-32
22	27	18-22
25	30	20-25-32
25	32	20-25-32
30	38	24-30-38
32	38	32
35	44	22-28-35

Tolerance in microns

## Cylindrical bushings-BP25 Bronze base

Inside Ø mm (Ø1)	Outside Ø mm (Ø2)	Bearing Length (L)
2	5	2-3
3	6	4-6-10
4	7	4-8-12
4	8	4-8-12
5	8	5-8-10-12-16
5	9	4-5-8
6	9	6-10-12-16
6	10	6-10-12-16
6	12	6-10-12-16
7	10	5-8-10
8	11	8-12-16-20
8	12	8-12-16-20
8	14	8-12-16-20
9	12	6-10-14
10	13	10-16-20-25
10	14	10-16-20-25
10	15	10-16-20-25
10	16	10-16-20-25
12	15	12-16-20-25
12	16	12-16-20-25
12	17	12-16-20-25
12	18	12-16-20-25
14	18	14-18-22-28

Inside Ø mm (Ø1)	Outside Ø mm (Ø2)	Bearing Length (L)
14	20	14-18-22-28
15	19	16-20-25-32
15	21	16-20-25-32
16	20	16-20-25-32
16	22	16-20-25-32
18	22	18-22-28-36
18	24	18-22-28-36
18	25	18-22-28-36
20	24	16-20-25-32
20	25	16-20-25-32
20	26	16-20-25-32
20	27	16-20-25-32
20	28	16-20-25-32
20	28	16-20-25-32
22	27	18-22-28-36
22	28	18-22-28-36
22	29	18-22-28-36
22	30	20-25-32-40
25	32	20-25-32-40
28	32	22-28-36-45
28	33	22-28-36-45
28	36	22-28-36-45
30	38	24-30-38
32	38	20-25-32-40-50

Tolerance in microns

### Tolerance

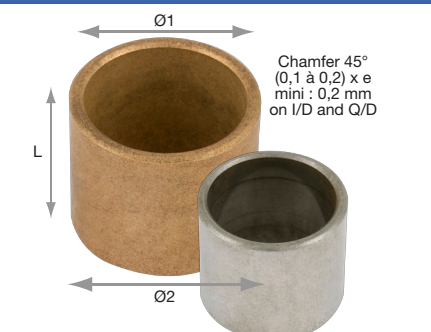
**Bearings before assembling**  
 Inside Ø - Ø1  
 Outside Ø - Ø2  
 Length - L > 10  
 Length - L ≤ 10

**Concentricity tolerance Ø1 Ø2**  
 Distance from max. readings for one complete lap of the bearing fitted on a mandrel.  
 Inside Ø ≤ 20  
 Inside Ø 20 < a ≤ 35  
 Inside Ø > 35

### Designation

Flange bearing I/D 22 - O/D 29 - L 36 is designed by :  
 - It **METAFRAM®** Grade BP25 (or FP20)  
 - It dimensions 22/29x36

Grades' choice and characteristics in sheet 5



# SELF-LUBRICATING STANDARD BLANKS

METRIC STANDARD  
IN STOCK **METAFRAM®**

## CORED BAR



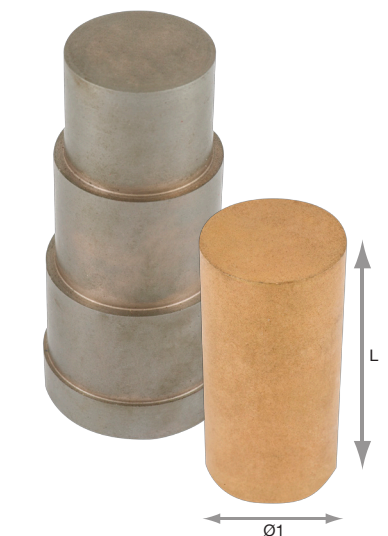
BP 25			FP 20			SO 16		
Ø1	Ø2	L	Ø1	Ø2	L	Ø1	Ø2	L
38	70	120	38	70	120	38	70	120
45	105	120	45	105	120	45	105	120
80	145	120	80	145	120	80	145	120
80	175	120	80	175	120	80	175	120
85	105	120	85	105	120	85	105	120

BP 25			FP 20			SO 16		
Ø1	Ø2	L	Ø1	Ø2	L	Ø1	Ø2	L
38	70	120	38	70	120	38	70	120
45	105	120	45	105	120	45	105	120
80	145	120	80	145	120	80	145	120
80	175	120	80	175	120	80	175	120
85	105	120	85	105	120	85	105	120

BP 25			FP 20			SO 16		
Ø1	Ø2	L	Ø1	Ø2	L	Ø1	Ø2	L
38	70	120	38	70	120	38	70	120
45	105	120	45	105	120	45	105	120
80	145	120	80	145	120	80	145	120
80	175	120	80	175	120	80	175	120
85	105	120	85	105	120	85	105	120

Dimensions in mm

## SOLID BLANK



BP 25		FP 20		SO 16	
Ø1	L	Ø1	L	Ø1	L
20	40	20	40	20	40
30	50	30	50	30	50
45	90	45	90	45	90
54	110	54	110	54	110
70	120	70	120	70	120
105	120	105	120	105	120
145	120	145	120	145	120

BP 25		FP 20		SO 16	
Ø1	L	Ø1	L	Ø1	L
20	40	20	40	20	40
30	50	30	50	30	50
45	90	45	90	45	90
54	110	54	110	54	110
70	120	70	120	70	120
105	120	105	120	105	120
145	120	145	120	145	120

BP 25		FP 20		SO 16	
Ø1	L	Ø1	L	Ø1	L
20	40	20	40	20	40
30	50	30	50	30	50
45	90	45	90	45	90
54	110	54	110	54	110
70	120	70	120	70	120
105	120	105	120	105	120
145	120	145	120	145	120

Dimensions in mm

## MACHINING

Follow the machining instructions recommended please look at datasheet "Manufacturing of self-lubricating blanks **METAFRAM®**" ref.CU2008E, available request.

## SELF-LUBRICATING SPHERICAL BUSHING ENQUIRY ONLY

Bronze BP 25	Ø1 Boring	Ø2 spherical	Ø3 outside	Length	Iron alloy FP20
Tolerance	+0,012 +0	Tolerance	+0,050 +0,050	Tolerance	+0,100 -0,100
4	10	9,5	8		
5	13	12,5	10		
6	13	12,6	8		
6	15	14,5	12		
6	16	15,5	12,5		
7	17	16,5	14		
8	16	15,5	12,5		

