

## DP4

### METAL-POLYMER LOW FRICTION PLAIN BEARINGS



### APPLICATIONS

**Automotive** – Braking systems, clutches, gearbox and transmissions, hinges: door, bonnet, boot, cabriolet roof tops, pedals; pumps: axial piston, radial piston, gear and vane; seat mechanisms, steering systems, struts and shock absorbers, wiper systems, etc.

**Industrial** – Aerospace, agricultural equipment, construction equipment, food and beverage, material handling equipment, forming machines: metal, plastic and rubber; office equipment, medical and scientific equipment, packaging equipment, pneumatic and hydraulic cylinders, pumps and motors, railroad and tramways, textile machinery, valves, etc.

### CHARACTERISTICS

- DP4 low friction bushings offer good wear and low friction performance over a wide range of loads, speeds and temperatures in dry running conditions
- Very good performance in lubricated applications
- Good performance in greased applications
- Suitable for linear, oscillating and rotating movements
- Lead-free material compliant to ELV, WEEE, and RoHS specifications
- Approved to standard DIN EN 1797: 2002-02 and ISO 21010: 2004-04 (Cryogenic Vessels – Gas/Material Compatibility) for piping, valves, fittings and other components in both gaseous and liquid oxygen for up to maximum temperature of 60°C and oxygen pressure of 25 bars. Contact GGB for further details.
- Approved to standard FAR 25.853 and FAR 25.855 - Federal Aviation Regulations – making it suitable for interior aircraft applications
- Approved to standard DIN EN 1797 and ISO 21010 (Cryogenic Vessels – Gas/Material Compatibility) for piping, valves, fittings and other components in both gaseous and liquid oxygen for up to maximum temperature of 60°C and oxygen pressure of 25 bars - contact GGB for further details
- Tested acc. to ASTM E595/ECSS-Q-ST-70-02C - Outgassing properties of materials used in Spacecraft equipment

### AVAILABILITY

**Bearing forms available in standard dimensions:** Cylindrical bushes, flanged bushes, thrust washers, flanged washers and sliding plates

**Bearing forms made to order:** Standard bushing forms in special dimensions, half-bushings, special shapes obtained by stamping or deep drawing, bearings with locating notches, lubricant holes and machined/stamped grooves, customized bushing designs, customized bearing designs



BEARING PROPERTIES		UNITS	VALUE
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**GENERAL**

Maximum load, p	Static	N/mm <sup>2</sup>	250
	Dynamic	N/mm <sup>2</sup>	140
Operating temperature	Min	°C	- 200
	Max	°C	280
Coefficient of linear thermal expansion	Parallel to the surface	10 <sup>-6</sup> /K	11
	Normal to the surface	10 <sup>-6</sup> /K	30

**DRY**

Maximum sliding speed, U	m/s	2.5
Maximum pU factor	N/mm <sup>2</sup> x m/s	1.0
Coefficient of friction, f		0.04 - 0.25*

**OIL LUBRICATED**

Maximum sliding speed, U	m/s	5.0
Maximum pU factor	N/mm <sup>2</sup> x m/s	10.0
Coefficient of friction, f		0.02 - 0.08

**RECOMMENDATIONS**

Shaft surface roughness, Ra	Dry	µm	0.3 - 0.5
	Lubricated	µm	≤ 0.05 - 0.40*
Shaft surface hardness	Unhardened acceptable, improved bearing life	HB	> 200

\* Depending on operating conditions

**OPERATING PERFORMANCE**

Dry	Good
Oil lubricated	Very Good
Grease lubricated	Good
Water lubricated	Fair
Process fluid lubricated	Good

**FOR SUPERIOR PERFORMANCE**

Water lubricated	DP4-B
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**MICROSECTION**

