

What are plane bearings?

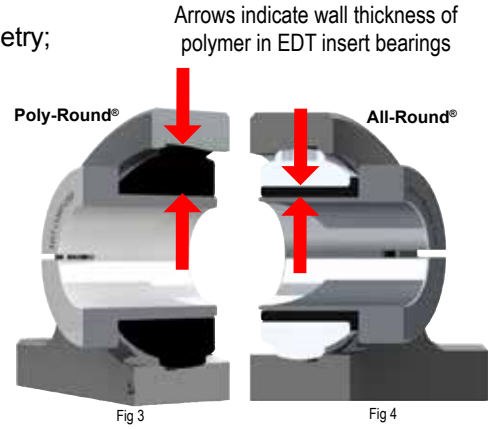
Plane bearings operate without rolling elements. The term 'plane' comes from geometry; it establishes the *plane of operation* of the centerline relative to the load.

Plane bearings can be made from a variety of materials (metals, woods, polymers, other materials). Bearing-grade polymers incorporate lubricity into the material to operate without needing any grease. Plane bearings without any grease or oil are considered Class 3 plane bearings. **EDT specializes in Class 3 polymer plane bearings.**

EDT offers a complete line of polymer plane bearings that interchange with insert ball bearings, both UC-style (setscrew) and SA-style (eccentric).

EDT Poly-Round® solid polymer inserts (Fig 3) and All-Round® polymer-and-stainless inserts (Fig 4) are available in a variety of polymer materials, each having different ranges of capabilities (see Material Selection Chart).

Check with EDT regarding the most appropriate style of bearing and bearing material for the specific applications you have. Poly-Round® bearings are an excellent choice on most applications where speed is not too fast. (All-Round® bearings are shown in the All-Round® section of the EDT catalog.)



Material Selection Chart

	Poly-Round® Bearing Materials	PV Limit*	Maximum Speed V (SFM)	Maximum Loading P (PSI)	Continuous Operating Temp.	Performance in Moisture		Δ T Dimensional Stability with Temp Change	Chemical Resistance	Abrasion Resistance	Impact Resistance	USDA/FDA Contact Approval^
						Wash down	Submerged					
Bearings	PA UHMW white	1,000	50	800	150°F / 65°C	Excellent	Excellent	Poor	Excellent	Abrasion applications are very non-predictable. Each application must be tested for abrasion resistance.	Excellent	Direct
	AA white	2,000	200	1,000	160°F / 71°C	Excellent	Good	Fair	Fair		Fair	Direct
	NA gray	6,000	350	2,000	200°F / 93°C	Excellent	Good	Fair	Good		Excellent	Incidental
	FA white	6,000	350	1,000	500°F / 260°C	Excellent	Excellent	Poor	Excellent		Excellent	Direct
	QF black	60,000	400	6,000	450°F / 232°C	Excellent	Excellent	Excellent	Excellent		Fair	Incidental
	MZ black	6000	300	4,000	650°F / 343°C	Excellent	Excellent	Excellent	Excellent		Fair	Incidental
	MY black	5000	250	3,000	800°F / 425°C	Excellent	Excellent	Excellent	Excellent		Fair	Incidental

* PV limits are shown for un-lubricated radial bearing applications. Low temperature / submerged installation may permit PV limits up to 2x higher.

^ All EDT products are suitable for use in food processing. Only locations with direct food contact require "direct" USDA/FDA contact approval

Plane bearing capacity is measured by PV and will determine the amount of heat generated in the bearing. PV is the relationship of the load to the shaft speed in a bearing.

Factors influencing PV limits (heat generation) include:

- Material selection
- Journal surface finish
- Bearing wall thickness
- Running clearance
- Proximity to moisture
- Ambient temperature
- Cycle time

HOW TO CALCULATE PV

PV - P x V

P - pressure in PSI (lbs/sq in)

V - velocity in SFM (surface ft/min)

P - F/A

where F = force (load) on bearing

A = shaft dia (in) x LTB

(LTB = bearing length through the bore)

V - .262 x D x RPM

where D = shaft diameter (in)

RPM = shaft revolutions/min