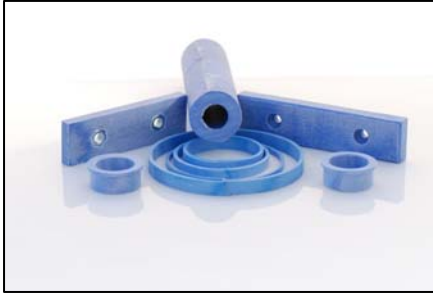


ProPlas® Composites

ProPlas Composite bearing materials are composed of modified thermoset resin systems reinforced with synthetic fabrics and impregnated with solid lubricants.



ProPlas® Composites provide:

- High Compressive Strength
- Self Lubrication
- Low Friction
- Virtually Zero Water Absorption
- Wide Temperature Range
- Outstanding Abrasion Resistance
- Easily Machined
- Cost Effective

The construction process of ProPlas Composites utilizes specialized technologies to encapsulate the internal lubricants and woven reinforcing fabrics within the resin system. The materials are then cured under highly controlled conditions insuring uniform mechanical properties and lubricant dispersion throughout the material.

Applications for ProPlas Composites:

- 
- Offroad/Construction
 - Petrochemical
 - Pulp/Paper
 - Hydraulics
 - Food Processing
 - Forest Products
 - Marine
 - Packaging Machinery
 - Material Handling/Conveying
 - Textile Machinery
 - Water Treatment
 - Railway
 - Hydroelectric & more.....

Applications can be rotary, linear or oscillating but usually require one or more of the performance benefits offered by the materials.

- High Load Capability
- Extremely Low Absorption
- Abrasion Resistance
- Homogeneous Bearing Grade Material
- Self Lubrication
- Low Friction
- Abrasion Resistance

ProPlas® Composite Material Grades:

P106 General Engineering

Excellent load, friction and wear properties in most equipment applications. Operating temperature range of cryogenic to +200° F.

P116 Abrasion Resistant

Utilizes proprietary resin/fabric system to offer superior performance in high abrasion environments. Operating temperature range of cryogenic to +200°F.

P306 Acid/Alkali Resistant

Retains properties in most acid/alkali environments. Not recommended for acetone or ketone media applications. Operating temperature range of cryogenic to +200° F. pH range 3-12.

ProPlas HT - High Temperature

Utilizes high temperature resin/fabric system to offer superior performance in high temperature applications. Operating temperature range of cryogenic to +450°F.

ProPlas HP1 - High Performance Liner

Utilizes high performance fabric/lubricant system to offer superior friction and wear performance in dynamic applications. Operating temperature range of cryogenic to +200°F.

ProPlas composites are available in finished machined components or tube and sheet for customer fabrication.

Standard Tube:

Length: 30"
 ID: ½" to 14 ¼"
 OD: ¾" to 40"

Standard Sheet:

Thickness: 1/16" to 1 ½"
 Sheet Size: 30" x 48"
 ProPlas HT Sheet Size: 24" x 48"

Application Guidelines

Substrate Hardness

General theory for substrate wear resistance is the harder the better. However, most ProPlas Composites can be utilized in applications with minimum hardness levels or Rb 25 (304 SS hardness, dependent upon application parameters).

Optimum substrate hardness recommendation is Rb 94, Rc15 or 200 on the Brinell hardness scale. Exception: ProPlas HT requires Rc50, 477 Brinell substrate hardness.

Surface Finish

For best performance, a minimum of a 32 rms (.08µmRa) or better is desired.

Speed / Load

PV: 20,000
 Surface Speed: 40 SFM (dry, low load)
 Static Load: 14,400 psi **
 Dynamic Load: 10,000 psi **

Note: Due to ProPlas Composites extremely low absorption level, all fluids act as a lubricant. Even low viscosity liquids, such as water, are trapped in the microscopic surface irregularities of the material and produce a hydrodynamic action, even at low speeds. Therefore, frictional values are significantly reduced and surface speeds can be increased in most lubricated environments.

**Load ratings listed are recommended maximums with no permanent deflection. As with all composite bearing materials, higher loads are attainable but will result in permanent deflection/deformation.)

Mechanical Properties

Compressive Strength

Normal to Laminate
 Parallel to Laminate

45,000-50,000 lbs/in² 310-345 N/mm²
 14,000-14,500 lbs/in² 97-100 N/mm²

Tensile Strength

7,800-8,300 lbs/in² 54-57 N/mm²

Modulus of Elasticity

48 x 10⁶ lbs/in² .33 x 10⁴ N/mm²

Density

.046 lbs/in³ 1.25 gm/cm³

Coefficient of Friction

.17 Static, .12 Dynamic

Coefficient of Friction

.08 Static, .08 Dynamic

(ProPlas HP ID Liner)

Swell in Water (Saturation)

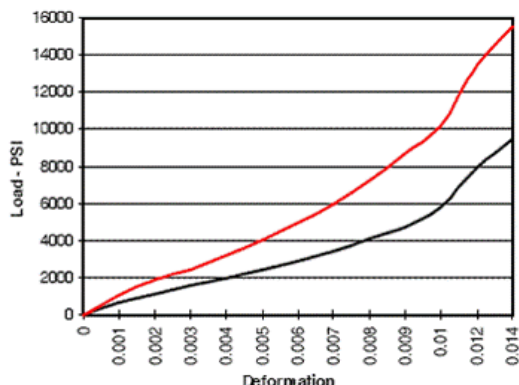
<0.1% of wall thickness

Hardness (Rockwell M)

100

Coefficient of Thermal Expansion

1.7 x 10⁻⁶



ProPlas® Composite materials demonstrate elastic deformation under compressive loads and vary with the material's thickness. The graph compares the load as a function of deformation using test sample thicknesses of **.125"** and **.250"**

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