

## Marine Composites

CIP Marine Composites are laminated composite bearing materials made by impregnating fabrics with thermosetting resin. The physical properties of CIP Marine Composites make them an excellent choice for various applications in the Marine Industry.

CIP Marine Composites offer marine engineers an attractive, environmentally friendly, cost-effective alternative to more traditional materials used commonly in the Marine Industry for bearings, wear pads, and guide strips. CIP Marine Composites are easily machined and can be freeze fitted, press fitted or resin chocked. The materials also have great dimensional stability, high load capabilities, and they do not contain toxic or abrasive fillers.



## Columbia Industrial Products

CIP is dedicated to providing the highest quality material performance with exceptional customer service to build long term relationships.

**Experience** built it.  
**Innovation** drives it.



### Standard Shapes

#### Tubes

- Minimum Bore .....3/8" (9.5mm)
- Maximum Bore.....54" (1371mm)
- Standard Lengths.....16" - 24" - 32" (406mm - 609mm - 812mm)

#### Sheets

- Minimum Thickness .....1/16" (1.6mm)
- Maximum Thickness.....2" normal - special order up to 6"
- Standard Widths.....16" - 24" - 32" (406mm - 609mm - 812mm)
- Standard Lengths.....24" - 36" - 48" - 60" (609mm - 914mm - 1219mm - 1524mm)

### Custom Components

Special components can be manufactured to customer's drawings. Parts requiring hex, square or irregular ID shapes can be produced.



### Benefits

- No Abrasive Fillers (Calcium Carbonate)
- Environmentally Friendly
- Wet or Dry Running
- Exceptional Material Performance
- Stable in Fresh & Salt Water
- Self Lubricating
- Low Friction
- Edge Load Tolerant
- Excellent Wear Life
- High Shock Loading
- Low Moisture Absorption
- Custom Sizes
- Freeze Fitting
- Easy to Machine
- Machinable in Place
- Non-Conducting

### Physical & Mechanical Properties

Compressive Strength	
Perpendicular to Laminate.....	35,000 PSI
Perpendicular to Breaking.....	50,000 PSI
Parallel to Laminate.....	13,500 PSI
Tensile Strength.....	10,000 PSI
Tensile Modulus of Elasticity.....	470,000 PSI
Shear Strength.....	12,000 PSI
Flexural Modulus of Elasticity .....	260,000 PSI
Hardness Rockwell.....	100 M
Density.....	.045#/cu.in.
Water Absorption.....	<0.1%
<i>(Tests performed on sheet)</i>	

### Thermal Properties

#### Operating Temperatures

Range.....-40°F to +200°F (20°C - 113°C)

#### Coefficient Calculation

Range.....68°F to +200°F (20°C - 93°C)

Normal to Laminate..... $6.7 \times 10^{-5}$  in/in/°F (1.7 x 10<sup>-3</sup> mm)

Parallel to Laminate..... $3.8 \times 10^{-5}$  in/in/°F (9.6 x 10<sup>-4</sup> mm)



Added **performance**



### Applications

- Rudder Bearings
- Stern Tube Bearings
- Stabilizer Bearings
- Propeller Shaft Bearings
- Pintle Bearings
- Side Thruster Bearings
- Deck Machinery Bearings
- Slip way Pads
- Guide Strips
- Crane Mast Bearings
- Fairleads
- Pulley Line Bearings
- Thrust Washers
- Wear Pads



### CIP Services World Wide

- Superior Customer Service
- 24 Hour Emergency Support
- Engineering & Technical Support
- Custom Sizes
- Short Lead Times

**Reliability** through  
**superior quality**





**CIP MARINE BEARINGS**

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