



# CIP MARINE BEARINGS



**COLUMBIA INDUSTRIAL PRODUCTS**  
CIP COMPOSITES™

## 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.....60" (1524mm)

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.



## CIP Services World Wide

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

## 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 (ASTM D695)

Ultimate.....	50,000 PSI	345 MPa
Yield.....	15,000 PSI	103 MPa
Parallel.....	13,500 PSI	93 MPa
Modulus.....	500,000 PSI	3447 MPa

Tensile Strength (ASTM D638).....11,000 PSI 75 MPa

Tensile Modulus of Elasticity (ASTM D638).....470,000 PSI 3,240 MPa

Poisson's Ratio (ASTM D3039-08).....0.231

Shear Strength (ASTM D2344).....12,000 PSI 82 MPa

Flexural Modulus of Elasticity (ASTM D790).....260,000 PSI 1,793 MPa

Hardness Rockwell M (ASTM D785).....100

Density (ASTM D792).....0.047 lbs/in<sup>3</sup> 1.3 g/cm<sup>3</sup>

Water Swell (ASTM D570).....< 0.15%

## Thermal Properties

### Operating Temperatures

Range.....-40°F to +200°F (-40° C - 93° C)

### Coefficient Calculation

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

Normal to Laminate..... $3.5 \times 10^{-5} / \Delta^{\circ} F$  ( $6.3 \times 10^{-5} / \Delta^{\circ} C$ )

Parallel to Laminate..... $1.8 \times 10^{-5} / \Delta^{\circ} F$  ( $3.2 \times 10^{-5} / \Delta^{\circ} C$ )



## 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



Added **performance**



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



Columbia Industrial Products, Please visit us online at [www.cipmarine.com](http://www.cipmarine.com)  
or call 541-607-3655 toll free 888-999-1835



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