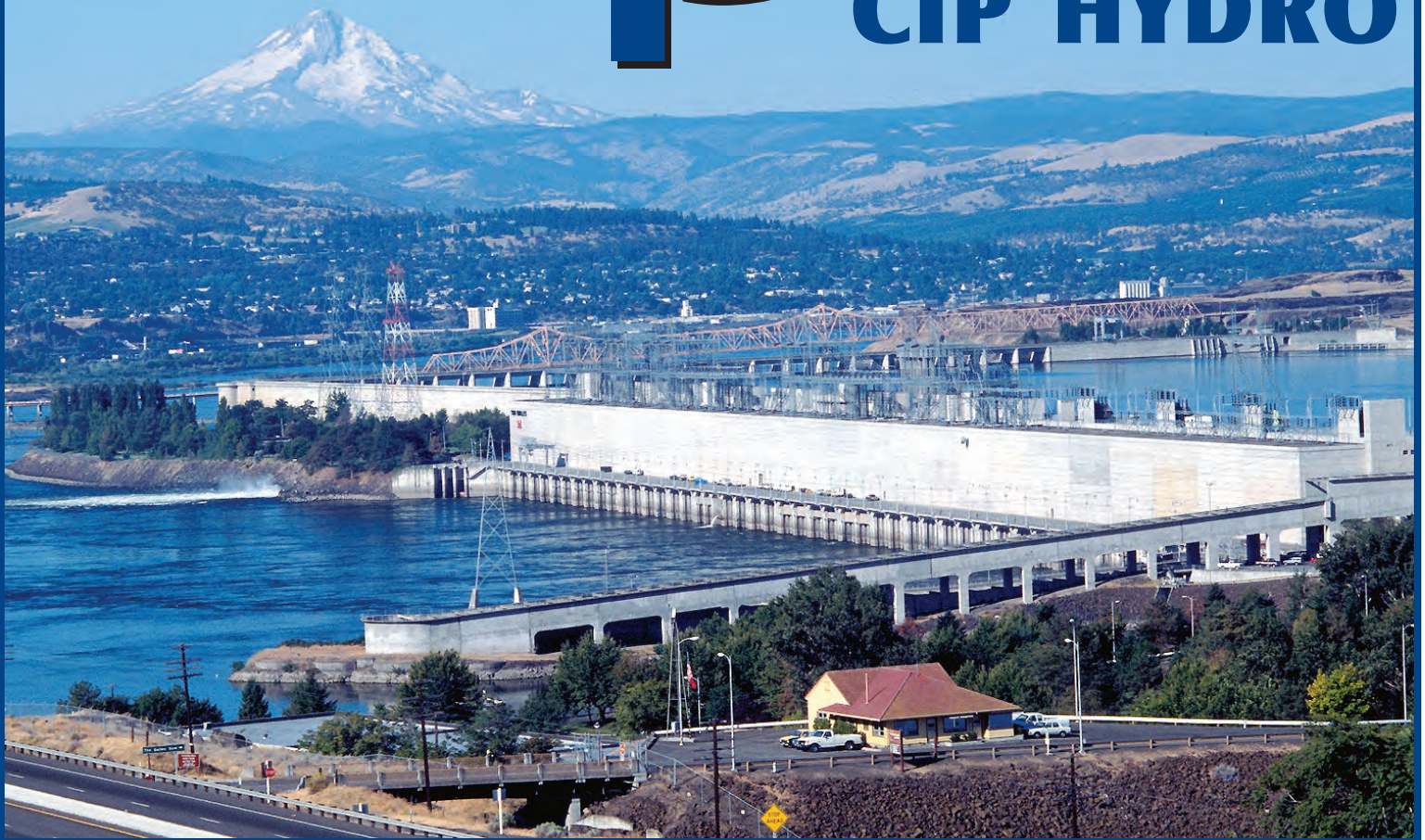




CIP HYDRO

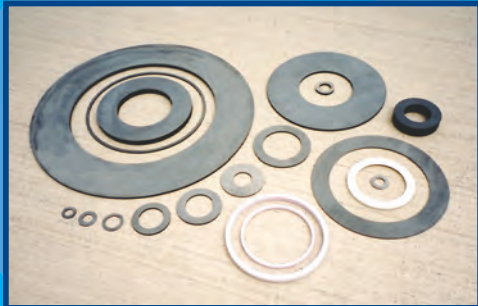


LAMINATE COMPOSITE MATERIAL FOR HYDRO PROJECT APPLICATIONS

CIP Composites

Columbia Industrial Products
29538 Airport Rd. • Unit A • Eugene, Oregon 97402
Phone: 541-607-3655 • Fax: 541-607-3657
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CIP HYDRO



THRUST WASHERS



LOCK GATES & MOORING BITTS



SWING BRIDGE BEARINGS



FISH TRAP BEARINGS



FISH SCREENS BEARINGS

CIP HYDRO COMPOSITE

CIP HYDRO Composite material is a laminated plastic material made by impregnating fabric with thermosetting resin. The physical and mechanical properties of CIP HYDRO composite make it an excellent bearing material. CIP HYDRO composite offers the design engineer an attractive, low cost alternative to more traditional materials used earlier in the hydro industry for bearings, wear pads, gates, slides and many other applications. CIP HYDRO composites are easily machined, have good dimensional stability and contain no harmful or toxic material.

CIP HYDRO PROJECT APPLICATIONS

- ▶ Butterfly valve seals
- ▶ Bridge pivot wear pads
- ▶ Control gate bearings
- ▶ Counter weight guide blocks
- ▶ Fish screen bearings
- ▶ Lock gate bearings
- ▶ Operating ring wear pads
- ▶ Running blade adjuster bearings
- ▶ Screen bearings & wear pads
- ▶ Trash rake bearing & wear pads
- ▶ Trunnion bearings
- ▶ Vertical pump shaft bearings
- ▶ Wicket gate linkage bearings
- ▶ Wicket gate bearings
- ▶ Wicket gate thrust washers
- ▶ Floating mooring bitt roller bearings
- ▶ Chain guide/slides
- ▶ Servo wear rings



GATE SERVO OPERATING RING CONNECTION, PIN REMOVED



GATE SERVO OPERATING RING CONNECTION WITH CIP COMPOSITE

PHYSICAL & MECHANICAL PROPERTIES CIP HYDRO

Ultimate Compressive Strength:
52,000 PSI

Compressive strength (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:
280,000 PSI

Hardness Rockwell :
M100

Density:
.045 #/cu. in.

Water Absorption:
<.1%



MARSHAL WADDINGTON (USACE) AND STEVE PHILLIPS (CIP) INSPECTING WICKET GATE LINKAGE.

TEST RESULTS

CIP HYDRO Composite has been tested by Power Tech Labs in Surrey, British Columbia, Canada which resulted in these extremely low coefficients of friction numbers. The U.S. Army Corps of Engineers has listed CIP HYDRO bearings as approved materials for hydro projects.

dry static	=	.075
wet static	=	.056
dry dynamic	=	.065
wet dynamic	=	.046



OPERATING RING WITH LINKAGE TO WICKET GATES



WICKET GATE READY FOR REBUILD



TURBINE HEAD AND COVER



THRUST BEARING SPIDER HOUSING



GENERATOR ROTOR

CIP TUBES & SHEETS

TUBE

Minimum bore 3/8"
Maximum bore 54"
Standard Lengths 16" - 24" - 32"
Special sizes available upon request.

SHEET

Minimum thickness 1/16"
Maximum thickness 2" normal- special order up to 6"
Standard widths 16" - 24" - 32"
Standard lengths 24" - 36" - 48" - 60"

MACHINING

CIP composite is readily machinable by conventional machining techniques and, as a general guide, may be treated as bronze but should be machined dry without coolant. For turning, tungsten carbide-tipped tools should be used to obtain a fine finish. High-speed steel tools can be used for machining when accuracy below .005" is not required and for small quantity production. For details contact our engineering department.

CIP composites are completely non-toxic. It is advisable to use adequate dust extraction when machining CIP composites.

BENEFITS

- ▶ Low friction
- ▶ Edge load tolerant
- ▶ Self lubricating
- ▶ Excellent wear life
- ▶ High shock loading
- ▶ Pollution free
- ▶ Very low moisture absorption
- ▶ Custom sizes available
- ▶ Freeze fitting
- ▶ Easy to machine
- ▶ Wet or Dry running
- ▶ Short lead time
- ▶ Can be machined in place
- ▶ Non-conducting
- ▶ Manufactured in the U.S.A.
- ▶ Engineering support

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