

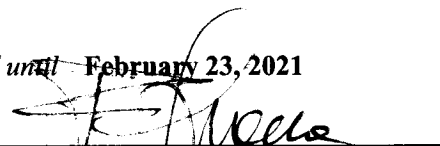


**TYPE APPROVAL CERTIFICATE**  
No. MAC062916CS/002

**This is to certify** that the product identified below is in compliance with the regulations herewith specified.

<i>Description</i>	<b>Rudder Bearings</b>
<i>Type</i>	<b>CIP Marine Composites</b>
<i>Applicant</i>	<b>COLUMBIA INDUSTRIAL PRODUCTS 29538 AIRPORT ROAD UNIT A OR 97402 EUGENE U.S.A.</b>
<i>Manufacturer</i>	<b>COLUMBIA INDUSTRIAL PRODUCTS</b>
<i>Place of manufacture</i>	<b>29538 AIRPORT ROAD UNIT A OR 97402 EUGENE U.S.A.</b>
<i>Reference standards</i>	<b>Part C, Chapter 1 Section 7 of RINA Rules</b>

Issued in **Genoa** on **February 24, 2016**. This Certificate is valid until **February 23, 2021**

  
\_\_\_\_\_  
RINA Services S.p.A.  
**Francesco Sciacca**

This Certificate annuls and replaces the previous one No. MAC045611CS/002 dated 05/03/2011.  
This certificate consists of this page and 1 enclosure



## TYPE APPROVAL CERTIFICATE

No. **MAC062916CS/002**

Enclosure - Page 1 of 2

CIP Marine Composites

### *Description of the products*

Rudder bearings. Multi-groove, full diameter, water lubricated bearings installed in stem castings or stern frame structure with freeze-fit or interference-fit.

Laminated plastic material made by impregnating polyester fabric with thermosetting resins, containing molybdenum disulphide, PTFE and other proprietary lubricants dispersed evenly throughout the material reducing friction.

### *Reference documents*

- CIP Marine US - CIP Marine Engineering Manual 3/1/2010
- CIP Inc. Manual 4\_25\_2014
- Test reports:
  1. CIP Marine Composite testing (report 7547003 of October 31, 2010) by MEIC (MEI-Charlton Inc.) laboratories: tests according to ISO 175 and ISO 604
  2. Composite testing (report 7539003 of May 27, 2010) by MEIC (MEI-Charlton Inc.) laboratories: shore durometer per ASTM D2240, compression strength testing per ASTM D695, specific gravity testing per ASTM D792
  3. Report 290990A(Revised 22/09/2009) dated 14/09/2009 by Exova OCM laboratories
  4. Report of tests No. 0607420-21, project 10-22 according to ASTM D 3702, Standard Method for Wear Rate and Coefficient of Friction of Materials in Self-Lubricated Rubbing Contact Using a Thrust Washer Testing Machine by Falex Corporation laboratories

### *Fields of application*

Support of rudder and rudder stock.

Nominal bearing pressure up to 12 N/mm<sup>2</sup> (1740 psi).

Supplied for shaft/liner sizes 102 mm (4") to 813 mm (32").

### *Acceptance conditions*

- For each application the relevant constructional drawings are to be sent to RINA Head Office for approval.
- Allowable bearing pressure for synthetic bearing material with hardness between 60 and 70 Shore D is indicated in Tab. 7 of Part B, Chapter 10, Section 1 of RINA Rules. Values greater than those given in Tab 7 may be accepted by the Society in accordance with the Manufacturer's specifications if they are verified by tests.



**TYPE APPROVAL CERTIFICATE**

No. **MAC062916CS/002**

Enclosure - Page 2 of 2

**CIP Marine Composites**

- The installation on board is to be made in accordance with the manufacturer's recommendations in compliance with all applicable RINA Rules.  
In particular, according to *CIP Marine Engineering Manual 3/1/2011*, the wall thickness for new bearing design is 0.04 inches x rudder stock/liner diameter +0.08 inches.
- For bearing dimensions, clearance, machining temperature, calculations and installation procedure (freeze method) reference is to be made to *CIP Marine Engineering Manual 3/1/2010*.
- This type approval is valid on the assumption that the manufacturer of the aforementioned bearings assures, under his own responsibility, that the product characteristics are in accordance with the ones specified on the documentation submitted.
- The acceptance of the a.m. products on board ship and other units classed with RINA is subject to the satisfactory outcome of testing as per the RINA rules.
- The approval may be withdrawn by RINA in the case of changes in the design not brought to the knowledge of RINA or in the case of changes in the RINA rules.
- This Certificate is issued for uses allowed by the laws and acts of Government in force.

Genoa 24/02/2016

