

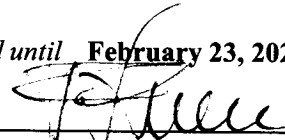


TYPE APPROVAL CERTIFICATE
No. **MAC062916CS/001**

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

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

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/001 dated 05/03/2011.
This certificate consists of this page and 1 enclosure



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CIP Marine Composites

Description of the products

Stern-tube bearings. Multi-groove, full diameter, water lubricated bearings installed in strut barrel or stern-tube 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 propeller and propeller shaft.

Nominal bearing pressure up to 10 N/mm² (1450 psi).

Supplied for shaft/liner sizes 9.5 mm (3/8") to 1372 mm (54").

Acceptance conditions

- For each application the relevant constructional drawings are to be sent to RINA Head Office for approval.
- On the basis of tests supplied by Manufacturer, provided that bearing design is in accordance with Manufacturer's Specifications and *CIP Marine Engineering Manual 3/1/2010*, bearing length less than 4 times the tail-shaft diameter required by the Rules may be accepted. In no case the length of synthetic bearings is to be less than 2 times the tail-shaft diameter required by the Rules.
- For stern-tube bearings, forced water circulation with flow indicators is to be provided.



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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 3/1/2010* :
 - if the bearings are used in water that is contaminated with abrasive materials, a filtered water supply should be considered.
 - the water flow rate should be a minimum of 96.3 to 144.3 liters per minute (1 to 1.5 gallons per minute) per inch of shaft diameter.
- 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

