



Confirmation of Product Type Approval

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product. This certificate reflects the information on the product in the ABS Records as of the date and time the certificate is printed.

Pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 11/MAR/2019. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until 28/JUL/2019 subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Product Name: Bearing, Rudder and Rudder Carrier Bearings, Water Lubricated
Stern Tube Bearings
Model Name(s): L2 Marine

Presented to:

ACM BEARINGS LIMITED
UNIT 2, DERWENT WAY
WATH WEST INDUSTRIAL ESTATE
ROTHERHAM
United Kingdom

Intended Service:

Rudder Bearing Material for use in water lubricated bearings, dry and wet Rudder Bearings, Rudder Carrier Bearings and Water Lubricated stern shaft bearings

Description:

Synthetic reinforced resin bonded composite

Tier:

3

Ratings:

Up to 10 MPa nominal bearing pressure Shaft size 30-60 mm, Min wall 7 mm Shaft size 61-100 mm, Min wall 8 mm Shaft size 101-150 mm, Min wall 10 mm Shaft size 151-200 mm, Min wall 11 mm Shaft size 201-250 mm, Min wall 13 mm Shaft size 251-300 mm, Min wall 14 mm Shaft size 301-350 mm, Min wall 16 mm Shaft size 351-400 mm, Min wall 17 mm Shaft size 401-450 mm, Min wall 18 mm Shaft size 451-500 mm, Min wall 20 mm Shaft size 501-550 mm, Min wall 22 mm Shaft size 551-600 mm, Min wall 25 mm

Service Restrictions:

Unit Certification is not required for this product.

Comments:

1) Type approval of this equipment is based on compliance, in all respects, with the ABS Rules in association with the intended service and is limited to the rating as indicated above; 2) The bearings are to be effectively secured against rotation; 3) For new installations, the minimum installed clearance is to be $di/1000 + 1.0$ mm ($di/1000 + 0.04$ in) on the diameter, where di is the inner diameter of the bushing,

in mm (in). This clearance is in no case to be taken less than 1.5 mm (0.06 in) on diameter. Diameter is also to be in accordance with ACM L2 marine Engineering Manual

Notes / Documentation:

This Product Design Assessment (PDA) is valid only for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

Term of Validity:

This Product Design Assessment (PDA) Certificate 04-LD436272-6-PDA, dated 29/Jul/2014 remains valid until 28/Jul/2019 or until the Rules or specifications used in the assessment are revised (whichever occurs first). This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product. Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA. Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

ABS Rules:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product. The Rules applicable to this assessment are: 2012 Steel Vessel Rules 1-4-4/3.7, 3-2-14/15.1 and 4-3-2/5.15

National Standards:**International Standards:****Government Authority:****EUMED:****Others:**

Manufacturers Standards: L2 Marine Engineering Manual ACM Procedure ABS001 Issue 4

Model Certificate**Model Certificate No****Issue Date****Expiry Date**

PDA

04-LD436272-6-PDA

29/JUL/2014

28/JUL/2019



ABS Programs

ABS has used due diligence in the preparation of this certificate and it represents the information on the product in the ABS Records as of the date and time the certificate was printed. Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and quality control arrangements. Limited circumstances may allow only Prototype Testing to satisfy Type Approval. The approvals of Drawings and Products remain valid as long as the ABS Rule, to which they were assessed, remains valid. ABS cautions manufacturers to review and maintain compliance with all other specifications to which the product may have been assessed. Further, unless it is specifically indicated in the description of the product; Type Approval does not necessarily waive witnessed inspection or survey procedures (where otherwise required) for products to be used in a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS. Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.



CERTIFICATE NUMBER: HU2568792-X1

PORT OFFICE: HULL, U.K.

Certificate of MANUFACTURING ASSESSMENT

This is to certify that: The Undersigned did evaluate the relevant manufacturing quality procedures for the type of products of the manufacturer:

ACM BEARINGS LIMITED Plant at **ROTHERHAM, U.K.**

The methods of assuring and controlling quality during production as required by the ABS Rules or Guides for the product and the associated specifications or standard were verified to reflect the specific surveys, required by the Rules and Standards for the manufacture of:

Bearing, Rudder and Rudder Carrier Bearings, Water Lubricated Stern Tube Bearings

The manufacturer presented a sample or specimen of the product, representative of the "type" approved, to the undersigned, for the purpose of verifying that the "type" has been manufactured in conformance with the Manufacturer's Product Design Assessments.

This Certificate of Manufacturing Assessment is an evaluation of the manufacturer alone and is neither an approval nor a rejection of the product described above. Unless cancelled, expired or revoked, this certificate remains valid subject to annual audits

Consult the ABS Type Approval website to confirm the continued validity of this certificate and the status of the particular products being manufactured.

ISSUE DATE	12 March 2014	EXPIRATION DATE	11 March 2019
SURVEYOR		M. BELCHER	
FIRST ANNUAL ENDORSEMENT			06 MAY 2015
SECOND ANNUAL ENDORSEMENT			04 MAY 2016
THIRD ANNUAL ENDORSEMENT			12 May 2017
FOURTH ANNUAL ENDORSEMENT			02 MAY 2018

Note: This Certificate evidences compliance with one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping and is issued solely for the use of the Bureau, its committees, its clients or other authorized entities. This Certificate is a representation only that the structure, item of material, equipment, machinery or any other item covered by this Certificate has met one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping as of the date of issue. Parties are advised to review the Rules for the scope and conditions of classification and to review the survey records for a fuller description of any restrictions or limitation on the vessel's service or surveys. The validity, applicability and interpretation of this Certificate is governed by the Rules and standards of American Bureau of Shipping who shall remain the sole judge thereof. Nothing contained in this Certificate or in any notation made in contemplation of this Certificate shall be deemed to relieve any designer, builder, owner, manufacturer, seller, supplier, repairer, operator or other entity of any warranty express or implied.



ABS

TYPE APPROVAL PROGRAM

CERTIFICATE NUMBER

HU1637942-X1 REV 27-Mar-09

PLANT LOCATION

Rotherham, UK

ABS OFFICE

Hull, UK

CERTIFICATE OF Manufacturing Assessment

This is to Certify that a representative of this Bureau did, at the request of
ACM BEARINGS LIMITED

Attend their facilities at the location noted above, in order to carry out an audit of their facilities and associated quality assurance and quality control procedures. The facility is considered capable of consistently manufacturing;

BEARING, RUDDER BEARINGS & RUDDER CARRIER BEARINGS

in compliance with their ABS Product Design Assessment Certificates and the designated standards defined therein. The product listed on their current Product Design Assessment Certificates are eligible to be placed on this Bureau's *List of Type Approved Products*, subject to annual facility audits by a representative of this Bureau, and renewal of this Certificate after five (5) years.

ISSUE DATE 3-Mar-09

EXPIRATION DATE 2-Mar-14

SURVEYOR'S SIGNATURE

FIRST ANNUAL ENDORSEMENT

SECOND ANNUAL ENDORSEMENT

THIRD ANNUAL ENDORSEMENT

FOURTH ANNUAL ENDORSEMENT

Date: 30 MAR 2010

Date: 17 MAR 2011

Date: 15 MAR 2012

Date: 04 APR 2013

AB257 (03-04)

Note: This certificate evidences compliance with one or more of the Rules, Guides, standards, or other criteria of American Bureau of Shipping; or a statutory, industrial, or manufacturer's standard, and is issued solely for the use of the Bureau, its committees, its clients, or other authorized entities. This certificate is governed by the terms and conditions on the reverse side hereof.



CERTIFICATE NUMBER SI503153-X1
 PLANT LOCATION Wath Upon Deame, Rotherham, UK
 ABS OFFICE Sheffield, UK

CERTIFICATE OF Manufacturing Assessment

This is to Certify that a representative of this Bureau did, at the request of

ACM Bearings Limited

Attend their facilities at the location noted above, in order to carry out an audit of their facilities and associated quality assurance and quality control procedures. The facility is considered capable of consistently manufacturing;

Marine Bearings and Bearing Materials

in compliance with their ABS Product Design Assessment Certificates and the designated standards defined therein. The product listed on their current Product Design Assessment Certificates are eligible to be placed on this Bureau's *List of Type Approved Products*, subject to annual facility audits by a representative of this Bureau, and renewal of this Certificate after five (5) years.

ISSUE DATE 10-Mar-04 EXPIRATION DATE 10-Mar-09

SURVEYOR'S SIGNATURE	<u>pp G. L. Ford</u>	
FIRST ANNUAL ENDORSEMENT	<u>[Signature]</u>	Date: <u>4th May 2005</u>
SECOND ANNUAL ENDORSEMENT	<u>[Signature]</u>	Date: <u>25 April 2006</u>
THIRD ANNUAL ENDORSEMENT	<u>[Signature]</u>	Date: <u>06 MARCH 2007</u>
FOURTH ANNUAL ENDORSEMENT	<u>[Signature]</u>	Date: <u>04 MARCH 2008</u>

AB257 (03-04)

Note: This certificate evidences compliance with one or more of the Rules, Guides, standards, or other criteria of American Bureau of Shipping; or a statutory, industrial, or manufacturer's standard, and is issued solely for the use of the Bureau, its committees, its clients, or other authorized entities. This certificate is governed by the terms and conditions on the reverse side hereof.



ABS

CERTIFICATE NUMBER

04-LD436272-4-PDA

DATE

30 August 2012

ABS TECHNICAL OFFICE

London Engineering Department

CERTIFICATE OF DESIGN ASSESSMENT

This is to Certify that a representative of this Bureau did, at the request of
ACM BEARINGS LIMITED - ROTHERHAM

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

PRODUCT: **Bearing, Rudder and Rudder Carrier Bearings, Water Lubricated Stern Tube Bearings**

MODEL: **L2 Marine**

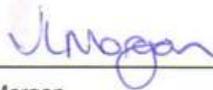
This Product Design Assessment (PDA) Certificate 04-LD436272-4-PDA, dated 30/Aug/2012 remains valid until 04/Jul/2017 or until the Rules or specifications used in the assessment are revised (whichever occurs first).

This PDA is intended for a product to be installed on an ABS classed vessel, MODU or facility which is in existence or under contract for construction on the date of the ABS Rules or specifications used to evaluate the Product.

Use of the Product on an ABS classed vessel, MODU or facility which is contracted after the validity date of the ABS Rules and specifications used to evaluate the Product, will require re-evaluation of the PDA.

Use of the Product for non ABS classed vessels, MODUs or facilities is to be to an agreement between the manufacturer and intended client.

AMERICAN BUREAU OF SHIPPING



John L. Morgan
Engineer

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by the terms and conditions as contained in ABS Rules 1-1-A3/3.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010).

ACM BEARINGS LIMITED

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Email: carl.buddery@acmbearings.co.uk



MA Certificate No. 09-HU1637942-X1

STANDARDS

ABS Rules:

The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product. The Rules applicable to this assessment are: 2012 Steel Vessel Rules 1-4-4/3.7, 3-2-14/15.1 and 4-3-2/5.15

National:

NA

International:

NA

Government Authority:

NA

EUMED:

NA

Others:

Manufacturers Standards:
L2 Marine Engineering Manual
ACM Procedure ABS001 Issue 4