



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **S-8014**

This is to certify that the  
**Rudder Bearing Bushing Material, Synthetic**

with type designation(s)  
**ACM L2 Marine**

Issued to  
**ACM Bearings Ltd**  
**ROTHERHAM, SOUTH YORKSHIRE, United Kingdom**

is found to comply with  
**Det Norske Veritas' Type Approval Programme 1-501.5, 2011, Synthetic Rudder Bearing Bushing Materials**  
**Det Norske Veritas' Rules for Classification of Ships**

Application  
**Max. surface pressure 5.5 MPa for the synthetic bearing against steel, non-lubricated, max. 10 MPa water or oil lubricated. The Type Approval is valid only when the installation/application of the product is according to the DNV Rules and the Manufacturer's specification.**

This Certificate is valid until **2018-06-30**.

Issued at **Høvik** on **2014-03-13**

for **Det Norske Veritas AS**

DNV local station: **Manchester**

Approval Engineer: **Gisle Hersvik**

**Martin Strande**  
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.

The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

## Product description

**ACM L2 Marine:** A polyester resin bonded, polyester fibre reinforced Rudder Bearing Bushing Material with added friction modifiers (Molybdenum Disulphide and PTFE).

## Application/Limitation

Maximum surface pressure:

- 10 N/mm<sup>2</sup> for the synthetic bearing against steel, water or oil lubricated.
- 5.5 N/mm<sup>2</sup> for the synthetic bearing against steel, non-lubricated (dry running).

Area of application will be evaluated during approval of classified objects if the surface pressure exceeds 5.5 N/mm<sup>2</sup>.

The maximum surface pressure of 10 N/mm<sup>2</sup> will be subject to evaluation w.r.t. service experience etc. in connection with renewal of the certificate.

The Type Approval is valid only when the installation/application of the product is in accordance with the specified Rules and the Manufacturer's specification.

## Type Approval documentation

1. Previous Type Approval Certificate No. S-6208.
2. Assessment Report from DNV Manchester, Nos. SHF-13-088868 and SHF-13-088868a of 2014-02-07,
3. Email from ACM of 2014-02-03, including Smithers Rapra Test Report, Proposal No. 123154MM, "Composite Testing (ACM L2 Marine)" of 2014-01-30,
4. Application for Type Approval of 2013-11-13,
5. ACM L2 Marine Engineering Manual Rev 3.6, ACM L2 Marine Rudder Fact Sheet, ACM L2 Marine Workboat Shaft Fact Sheet, ISO 9001 Certificate,
6. Email from ACM of 2010-06-10, including test data and calculations.

## Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**.

## Marking of product

Product/package shall be marked with *manufacturer's name*; **ACM Bearings Ltd., UK** and *type designation* **ACM L2 Marine**.

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV Type Approval Certificate.

## Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical Assessment to be performed after two (2) years (Certificate Retention) and at renewal after four (4) years (Certificate Renewal).

The main elements of the Periodical Assessment are to:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV Type Approval Certificate.

END OF CERTIFICATE