

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Sacrificial Anode Material for Corrosion Protection**with type designation(s)
A-Guard

Issued to

Oilquip Limited
South Shields, Tyne & Wear, United Kingdom

is found to comply with

DNV GL class programme DNVGL-CP-0107 – Type approval – Sacrificial anode materials
Det Norske Veritas' Recommended Practices, DNV-RP-B401 Cathodic Protection Design**Application :****The mean current capacity of the sacrificial anode material after 12 months free running testing is 2357 Ah/kg. The mean closed circuit potential is -1079 mV vs. Ag/AgCl seawater. The approval is given for use in sea water at temperatures below 30°C.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2017-05-09**This Certificate is valid until **2017-12-31**.for **DNV GL**DNV GL local station: **Newcastle-upon-Tyne**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.



Product description

A-Guard; Aluminium-based (Al-Zn-In) sacrificial anode material.

Manufactured by

MG Duff International Limited, Unit 6 A/B, Throckley Way, Middlefield Industrial Estate, South Shields, Tyne and Wear, NE34 0NU, UK

DNV GL local station: Newcastle-upon-Tyne

Responsibility

The Company (stated on the front page of this Certificate) takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Application/Limitation

Approval is given for the sacrificial anode material; not for anode design.

The mean current capacity of the sacrificial anode material after 12 months free running testing is **2357 Ah/kg**. The mean closed circuit potential is -1079 mV vs. Ag/AgCl seawater.

The recommended design electrochemical capacity for aluminium based alloys in seawater is 2000 Ah/kg (ref. DNV-RP-B401).

The approval is given for use in seawater at temperatures below 30°C.

Type Approval documentation

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**. Refer to Type Test Report from DNV Energy Report No. 2008-5106 "*Long Term Electrochemical Testing According to DNV-RP-B401, Appendix C of A-guard Aluminium Alloy (Al/Zn/In)*", Rev. 00, of 2008-03-12 for details on testing performed.

Testing has been performed with basis in DNV RP-B401 (2005).

Marking of product

Product shall be marked with *manufacturer's name*; **MG Duff International Limited, South Shields, Tyne and Wear, UK** or *type designation*; **A-G** (for A-Guard) and *Melt Number*.

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 GL 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.

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:



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Certificate No: **TAS000011M**

- 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 DNV GL Type Approval Certificate.

END OF CERTIFICATE