

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Sacrificial Anode Material for Corrosion Protection**

with type designation(s)

IMPALLOY III, IMPALLOY III-S and IMPALLOY III-CW

Issued to

**Impalloy Limited
WALSALL, United Kingdom**

is found to comply with

Det Norske Veritas' Recommended Practices, DNV-RP-B401 Cathodic Protection Design**Det Norske Veritas' Type Approval Programme 1-601.2, 2009, Sacrificial Anode Materials****Application :**

The mean current capacity of the sacrificial anode material after 12 months free running testing is 2580 Ah/kg. The mean closed circuit potential is -1110 mV vs. Ag/AgCl seawater. The approval is given for use of the sacrificial anode material in seawater at temperatures below 30°C.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **2019-06-30**.Issued at **Høvik** on **2015-07-08**DNV GL local station: **Manchester**Approval Engineer: **Gisle Hersvik**for **DNV GL**

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.



Job Id: **262.1-011230-2**
Certificate No: **TAS000001F**

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

Product description

Sacrificial Aluminium (Al-Zn-In) Anode Materials:
IMPALLOY III, IMPALLOY III-S and IMPALLOY III-CW.

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 calculated to be **2580** Ah/kg. The mean closed circuit potential is -1110 mV vs. Ag/AgCl seawater.

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

Approval is given for use of the sacrificial anode material in seawater at temperatures below 30°C.

Type Approval documentation

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**, including 12 months testing carried out at DNV Industry, Bergen, ref. Technical Report No. BGN-R795057, "Long Term Testing of Sacrificial Anodes", dated 7 April 1995.

Testing has been performed with basis in DNV RP-B401 (1993).

Marking of product

For traceability to this Type Approval Certificate, the products are to be marked: **Impalloy** with cast number, where "X" in the cast number denotes **Impalloy III**.

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. 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 DNV GL Type Approval Certificate.

END OF CERTIFICATE