



TYPE APPROVAL CERTIFICATE

Certificate No:
TAS000001F
Revision No:
2

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
DNV GL class programme DNVGL-CP-0107 – Type approval – Sacrificial anode materials
DNV recommended practice DNV-RP-B401 – Cathodic protection design, May 2021

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.

Issued at **Høvik** on **2021-08-24**

for **DNV**

This Certificate is valid until **2024-07-07**.

DNV local station: **Manchester**

Approval Engineer: **Gisle Hersvik**

Gustav Heiberg
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

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

- **Impalloy III;** a general purpose alloy used for relatively short life anodes such as ships hulls/tanks.
- **Impalloy III-S;** for use in applications requiring long life such as offshore pipelines, sub-sea structures and marine terminals.
- **Impalloy III-CW;** commonly specified for use in deepwater applications.

Anode alloy specifications (%):

	Zn	In	Si	Fe	Cu	Cd	Ti	Al
Impalloy III	2.8-6.5	0.01-0.02	0.12 max.	0.12 max.	0.006 max.	0.002 max.	0.025 max.	Remainder
Impalloy III-S	3.0-5.5	0.016-0.04	0.1 max.	0.09 max.	0.005 max.	0.002 max.	0.02 max.	Remainder
Impalloy III-CW	4.75-5.75	0.016-0.02	0.08-0.12	0.06 max.	0.003 max.	0.002 max.	0.02 max.	Remainder

Others, each: max. 0.02%

Others, total: max. 0.05%

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

1. Assessment Report from DNV Manchester of 2021-07-09.
2. WI-PSI01 (Revision 02) "WORK INSTRUCTION TITLE: PRODUCT SPECIFICATION & IDENTITY".
3. ISO 9001 Certificate No. 20619 (issued by NQA Certification Limited).
4. Assessment Report from DNV GL Manchester of 2019-07-07.
5. Anode Alloys specifications; <http://www.impalloy.com/anodes/anode-alloys/>.
6. Example of delivery documentation.
7. Application for Type Approval of 2019-03-28.
8. Assessment Report from DNV GL Manchester of 2015-06-10, ISO 9001 and ISO 14001-certificates, Production Specification & Identity (Procedure) and ITP examples,
9. IMPALLOY Technical Factfile.
10. Survey Report from DNV Sheffield of 2011-06-15.
11. DNV Industry Technical Report No. BGN-R795057, "Long Term Testing of Sacrificial Anodes", dated 7 April 1995.

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**, including 12 months testing carried out at DNV 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

The products are to be marked: **Impalloy** with a product identification system, comprising cast Week No./Year/Furnace No./Alloy Type/Weekly Melt Number/Suffix (Piece number cast from Melt), where "A" in the system denotes Aluminium.

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.



Job Id: **262.1-011230-4**
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Periodical assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>

END OF CERTIFICATE