DNV·GL

Certificate No:
TAS00002EB

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Sacrificial Anode Material for Corrosion Protection

with type designation(s)
Al-In-Zn Series Sacrificial Anode Material

Issued to
Fer Mo Enterprise Corporation
Kaohsiung, Taiwan

is found to comply with
DNV GL class programme DNVGL-CP-0107 – Type approval – Sacrificial anode materials
DNV GL recommended practice DNVGL-RP-B401 – Cathodic protection design, June 2017
DNV GL rules for classification – Ships
DNV GL offshore standards
NORSOK Standard M-503 Cathodic protection, Edition 3, May 2007

Application :

The mean current capacity of the sacrificial anode material after 12 months free running testing is 2673 Ah/kg. The mean closed circuit potential is -1092 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 **2020-03-10**
This Certificate is valid until **2025-03-09**.
DNV GL local station: **Kaohsiung**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

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.

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Job Id: **262.1-030050-1**
Certificate No: **TAS00002EB**

Product description

Al-In-Zn Series Sacrificial Anode Material; Aluminium based alloy sacrificial anode material.

Chemical Composition (%):

Fe	Zn	Si	Cu	Cd	In	Al
0.09 max	2.5–5.75	0.12 max	0.003 max	0.002 max	0.015-0.040	Remainder

Application/Limitation

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

For cathodic protection of steel structures in sea water sediment, sea mud, subsea pipelines, ship's hull, tank internals, steel structures buried in soil, etc.

The mean current capacity of the sacrificial anode material after 12 months free running testing was calculated to be **2673** Ah/kg. The mean closed circuit potential is -1092 mV vs. $Ag/AgCl_{seawater}$.

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

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

Type Approval documentation

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**. Refer to DNV GL Technical Report No. 2019-5469, Rev. 0 "*Long term anode testing of one aluminium alloy according to DNVGL-RP-B401 (2017), Annex C*" of 2020-01-07 for further details on the specific testing performed.

Testing has been performed with basis in DNVGL-RP-B401 (2017).

Marking of product

Product shall be marked with **FMAA YYMMDDHHS**, where

-FM: Fer Mo Enterprise Corporation -AA: Aluminium Anode -YY: Production year (two digits) -MM: Production month -DD: Production date	 -HH: Heat no. of each day -S: Serial of each heat no.

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 assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-CP-0338.

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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