

# TYPE EXAMINATION CERTIFICATE

This is to certify:

That the **Composite Handrails**

with type designation(s)

**Pultruded Composite Resin and Phenolic Guard Rails**

Issued to

**ENMAC ENGENHARIA DE MATERIAIS COMPOSTOS LTDA**  
**Arujá SP, Brazil**

is found to comply with

**ABNT NBR 15708-1:2014 Versão Corrigida:2014 - Indústrias do petróleo e gás natural –  
Perfis pultrudados, Parte 1: Materiais, métodos de ensaio e tolerâncias dimensionais**

**ABNT NBR 15708-2:2014 - Indústrias do petróleo e gás natural - Perfis pultrudados, Parte 2:  
Guarda-corpo**

Application :

**Naval and Offshore Installations**

Issued at **Høvik** on **2016-01-29**

This Certificate is valid until **2021-01-28**.

DNV GL local station: **Rio de Janeiro, CMC**

Approval Engineer: **William Alvarenga**

Issued at **Rio de Janeiro** on **29/01/2016**



for **DNV GL**  
This document has been digitally signed and  
will therefore not have handwritten  
signatures.

Digitally Signed By: **Silva, Rafael**

**Rafael Bellucci Vitale Silva**  
**Head of Section**

## Product description

Guard Rail manufactured with pultruded profiles of resin acrylic and phenolic.

## Application/Limitation

Naval and Offshore Instalations.

Resin acrylic:

Limitations: • The product satisfies the CO emissions requirements only for not-covered areas (open and semi open environments) (Table 1 in Part 1 of ABNT NBR 15708 2014 edition)

## Type Examination documentation

Acc. to ABNT NBR 15708-1:2014 and ABNT NBR 15708-2:2014:

## Tests carried out

Resin acrylic:

Flame Spread – Report 1 026 451-203;  
Smoke Emission – Report 1 206 452-203;  
Toxic Gases – Report 1 206 452-203;  
Weatherability – Report LCP11-000865;  
Deformation of Handrail – Report ENM/ENG 014;  
Tensile Strenght Footer – Report ENM/ENG 014;  
Tensile Strenght of the handrail – Report ENM/ENG 014.

Phenolic:

Flame Spread – Report 1 021 053-203;  
Smoke Emission – Report 98 283-205;  
Toxic Gases – Report 98 283-205;  
Weatherability – Report LCP11-000143;  
Deformation of Handrail – Report ENM T.E. 01;  
Tensile Strenght Footer – Report ENM T.E 01;  
Tensile Strenght of the handrail – Report ENM T.E. 01.

## Marking of product

Product shall be marked with manufacturer's name, type designation and Type Examination certificate 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.

## Certificate Retention Survey

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

Assessment to be performed after 2.5 years (Certificate Retention) and at renewal after 5 years (Certificate Renewal).

The main elements of the Periodical Assessment are:

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

END OF CERTIFICATE