

**DNV·GL**

Certificate No:  
**E-14180**  
File No:  
**828.70**  
Job Id:  
**262.1-007569-2**

## TYPE APPROVAL CERTIFICATE

**This is to certify:**  
**That the Cable Tray**

with type designation(s)  
**Light Type (LLE), Heavy Type (LPE)**

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

is found to comply with  
**IACS Rec. No. 73 (June 2002)**  
**Det Norske Veritas' Rules for Classification of Ships and Mobile Offshore Units**

**Application :**  
**Cable trays suitable for use in gas hazardous areas.**

This Certificate is valid until **2018-06-30**.  
Issued at **Høvik** on **2015-04-27**

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

Approval Engineer: **Ludovico Gullifa**



for **DNV GL**

Digitally Signed By: Laumann, Marit  
Location: DNV GL Høvik, Norway  
Signing Date: 2015-04-30

**Marit Laumann**  
**Head of Section**

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## Product description

Glass Fibre Reinforced Plastic Cable tray system with acrylic resin. Light and heavy type complying with IACS Rec 73 (June 2002).

### Light type

Type designation	Width (mm)	Height (mm)	Length (mm)
LLE-#-100-A	100	101,6	3000 / 6000
LLE-#-200-A	200	101,6	3000 / 6000
LLE-#-300-A	300	101,6	3000 / 6000
LLE-#-400-A	400	101,6	3000 / 6000
LLE-#-500-A	500	101,6	3000 / 6000
LLE-#-600-A	600	101,6	3000 / 6000
LLE-#-700-A	700	101,6	3000 / 6000
LLE-#-800-A	800	101,6	3000 / 6000
LLE-#-900-A	900	101,6	3000 / 6000
LLE-#-1000-A	1000	101,6	3000 / 6000

### Heavy type

Type designation	Width (mm)	Height (mm)	Length (mm)
LPE-#-200-A	200	152,4	3000 / 6000
LPE-#-300-A	300	152,4	3000 / 6000
LPE-#-400-A	400	152,4	3000 / 6000
LPE-#-500-A	500	152,4	3000 / 6000
LPE-#-600-A	600	152,4	3000 / 6000
LPE-#-700-A	700	152,4	3000 / 6000
LPE-#-800-A	800	152,4	3000 / 6000
LPE-#-900-A	900	152,4	3000 / 6000
LPE-#-1000-A	1000	152,4	3000 / 6000

Symbol " # " is either 1 or 2, 1 = 6000mm length and 2 = 3000mm length.

Data given in table are for straight sections.

## Application/Limitation

Cable trays suitable for use in gas hazardous areas.

The cable trays shall be installed in accordance with the manufacturer's instructions and maximum loading table for each type.

The installation shall also be in accordance with DNV Rules. Cable ladders shall be mechanically protected in accordance with DNV Rules and especially care must be taken for installations on weather decks, in cargo hold areas and through cargo holds.

## Type Approval documentation

Drawings: Cable ladder light type ENF-003438 rev1, dated 2009-08-03  
Cable ladder heavy type ENF-003439 rev1, dated 2009-08-03

Test reports: ENM/ENG 013 Safe Working Load, dated 2010-02-03  
ENM/ENG 015, Impact resistance Test, dated 2010-04-01.  
Instituto de Pesquisas Tecnológicas Assay Report no 1007347-203 Safety report to fire, dated 2010-03-16, with translation from Manoel Antonio Schmidt I-77700/10 dated 2010-04-05.  
Instituto de Pesquisas Tecnológicas Assay Report no 116211-205 Determination of specific optical density of smoke and toxicity of the gases, dated 2010-03-16, with translation from Manoel Antonio Schmidt I-77698/10 dated 2010-04-05.  
CEPEL Test report DVLF - 10956/2010 Volumetric and surface electrical resistivity for polymeric materials with glass fiber reinforcement and grey coloured acrylic resin-ENMAC.

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### **Tests carried out**

Type tests are in accordance with IACS REC.73 (June 2002): Impact resistance test, Safe working load test (SWL), Flame retardant test, Smoke and Toxic test, Volumetric and Surface resistivity test.

### **Marking of product**

ENMAC – LPE(heavy type) or LLE(Light type) – Length – Width – A(Acrylic resin) – CA(classified area)

### **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.

The main elements of the periodical assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and RT to be carried out)
- Review of type approval documentation
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Periodical assessment shall be performed at least every second year.

**CÓPIA SEM VALOR COMERCIAL**