DNV·GL

# TYPE APPROVAL CERTIFICATE

Certificate No:
**TAE00002VZ**
Revision No:
**1**

## This is to certify:

**That the Lightweight Electric Cable**

with type designation(s)
**DMFRO**

Issued to
**Habia Cable AB**
**SÖDERFORS, Sweden**

is found to comply with
**DNV GL rules for classification – Ships, offshore units, and high speed and light craft**

## Application :

**General power and lighting. Control. Instrumentation and communication**

**Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**

| | |
|---|---|
| **Rated voltage (kV)** | **0,6/1** |
| **Temp. class (°C)** | **95** |

Issued at **Høvik** on **2019-11-30**

This Certificate is valid until **2023-05-08**.
DNV GL local station: **Sweden CMC**

Approval Engineer: **Ivar Bull**

for **DNV GL**
Digitally Signed By: Trond Sjåvåg
Location: DNV GL Høvik, Norway

**Trond Sjåvåg**
**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.

Job Id: **262.1-028533-2**
Certificate No: **TAE00002VZ**
Revision No: **1**

## Product description

Type: DMFRO

| | |
|---|---|
| Conductor: | Tinned, stranded copper class 5 |
| Core insulation: | HFI 140 |
| Fillers (optional) | Halogen free compound |
| Bedding (optional) | Halogen free flame retardant compound |
| Binder (optional) | Tape |
| Individual screen(optional) | Metal laminated tape screen or Tinned copper wire braid |
| Inner sheath (optional) | SHF1 |
| Screen (optional) | Metal laminated tape screen and/or Tinned copper wire braid (minimum 90% coverage density) |
| Outer sheath: | SHF2 MUD |

| No of elements | Cross sectional area [mm$^2$] |
|---|---|
| 2-50 cores | 0,5 0,75 1 1,5 2,5 |
| 2-5 cores | 4 6 10 |
| 1-37 Pairs | 0,5 0,75 1 1,5 2,5 |
| 1-32 Triples | 0,5 0,75 1 1,5 2,5 |

## Application/Limitation

The requirements of SOLAS Amendments Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bunches of Cables or Wires) are fulfilled without any additional measures.

## Type Approval documentation

Datasheet and test reports.: See approval letter MCANO381/IVABU/ 262.1-026209-J-18

## Tests carried out

| Standard | Release | General description | Limitation |
|---|---|---|---|
| DNVGL-CP-0400 | 2015-12 | Type approval program for lightweight cables including the following tests:<br>No 14: Cold bend -30°C<br>No 25: Flammability large scale<br>No 26: Halogen content<br>No 27: Toxicity index<br>No 28: Smoke emission small scale<br>No 29: Smoke emission large scale<br><br>SHF mud resistance test according to NEK TS 606 | |
| IEC 60332-3-25 | 2009-02 | Tests on electric and optical fibre cables under fire conditions – Part 3-25: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category D | Charred portion of sample does not exceed 2,5 m above bottom edge of burner. |
| IEC 60754-1 | 2011-11 | Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content | Low Halogen:<br>≤ 0,5 % Halogen |
| IEC 60754-2 | 2011-11 | Test on gases evolved during combustion of materials from cables - Part 2: | Halogen free:<br>pH ≥ 4,3 |

| Standard | Release | General description | Limitation |
|---|---|---|---|
| | | Determination of acidity (by pH measurement) and conductivity | Conductivity ≤ 10 µS/mm |
| IEC 61034-1/2 | 2005-04 | Measurement of smoke density of cables burning under defined conditions | Low smoke: Light transmittance ≥ 70 % |

## Marking of product

Habia Cable DMFRO size 0.6/1 kV Habia product no. YYYY-Www – SE010 batchcode – IEC 60332-3-25.

SE010 = Söderfors factory

## Periodical assessment

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

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine tests (RT) and selected type tests (ref. to applicable class programs) checked (if not available these tests shall 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 is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE