

TYPE APPROVAL CERTIFICATE

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****Product(s) approved by this certificate is/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 **2018-05-09**This Certificate is valid until **2023-05-08**.DNV GL local station: **Stockholm**for **DNV GL**Approval Engineer: **Ivar Bull**

Andreas Kristoffersen
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.



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
Braid screen:	Tinned copper wire braid. Min Coverage 90%
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

Tests carried out

Standard	Release	General description	Limitation
DNVGL-CP-0400	2015-12	Type approval program for lightweight cables including the following tests: No 14: Cold bend -30°C No 25: Flammability large scale No 26: Halogen content No 27: Toxicity index No 28: Smoke emission small scale No 29: Smoke emission large scale 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: ≤ 0,5 % Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH ≥ 4,3 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

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

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