Certificate No:
TAE00004KX

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Lightweight Electric Cable

with type designation(s)
DMFRO 250V

Issued to
Habia Cable China Ltd.
Changzhou, **China**

is found to comply with
DNV 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.

Rated voltage (kV)	**150/250V**
Temp. class (°C)	**95**

Issued at **Høvik** on **2022-11-11**
This Certificate is valid until **2027-11-10**.
DNV local unit: **Nanjing NB & CMC**

Approval Engineer: **Ivar Bull**

for **DNV**

Frederik Tore Elter
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Product description

Type: DMFRO 150/250V

Conductor:	Tinned, stranded copper class 5
Core insulation:	HFI 140 or HFI 140B
Fillers (optional):	Halogen free compound
Bedding (optional):	Halogen free flame retardant compound
Binder (optional):	Tape
Individual screen(optional) Inner:	Metal laminated tape screen or Tinned copper wire braid
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 [mm2]	Cross sectional area [AWG]
2-50 cores	0,5 0,75	AWG 22 to AWG 20
1-37 Pairs	0,5 0,75	AWG 22 to AWG 20
1-32 Triples	0,5 0,75	AWG 22 to AWG 20

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	2021-09	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 60332-3-22	2018-07	Tests on electric and optical fibre cables under fire conditions - Part 3-22: Test for vertical flame spread of vertically mounted bunched wires or cables - Category A	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
IEC 60332-3-25	2018-07	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 2,5m above bottom edge of burner.
IEC 60754-1	2019-11	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	2019-11	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	2019-11	Measurement of smoke density of cables burning under defined conditions	Low smoke: Light transmittance ≥ 70 %

Marking of product

Habia Cable DMFRO size 150/250V Habia product no. YYYY-Www – CN011 batch code – IEC 60332-3-22.

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