



Certificate No:
TAE00004NA

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)
HABIA MARINE DATABUS Cables

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 :

Data communication cables.
Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2023-02-28**

This Certificate is valid until **2028-02-27**.

for **DNV**

DNV local unit:

Approval Engineer: **Ivar Bull**

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.



Form code: TA 251

Revision: 2022-12

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Product description

Rated voltage peak: 300 V AC

Conductor: Bare, tinned or silver-plated copper conductor. Solid or stranded. Metric class 1, 2, 5 or 6. AWG sizes according to ASTM B286, ASTM B8 Class B or C

Insulation: PE or XLPE

Fillers and bedding (optional): Halogen free compound

Binder (optional): Tape

Individual screen (optional): Metal foil + copper drain wire or metal foil + metal braid or metal braid only

Individual sheath (optional): SHF1 or SHF2 or SHF2 Mud

Collective screen (optional): Metal laminated tape screen + bare, tinned or silver-plated copper drain wire

Collective braid: Tin plated copper braid minimum 80% coverage density

Binder (optional): Tape

Outer sheath: SHF1 or SHF2 or SHF2 Mud

Approved elements in table below can be combined.

No of elements	Cross sectional area [mm ²]	Cross sectional area [AWG]
1-4 cores	0,25 0,5 0,75	AWG 24 to AWG 18
1-2 pairs	0,25 0,5 0,75	AWG 24 to AWG 18

(Approx 0,22mm² to 0,82mm²)

Electrical data:

Conductor resistance: Max 9,5 Ω for 100 m as per IEC 61156-5 item 6.2.1.

Insulation resistance: 100 MOhm x km

Test voltage: 2kV DC for 1 minute or

AWG 18/21 2,5kV DC 2s, AWG 22/23 1500V DC 2s, AWG 24 1200V DC 2s

Capacitance: <60pF/m

Impedance: 76 to 165Ohm (f > 100kHz) depending on bus protocol

Table 113 – Cable specifications

Cable parameter	Type A	Type B
Impedance	135 to 165 Ω (f = 3 to 20 MHz)	100 to 130 Ω (f > 100 kHz)
Capacity	< 30 pF/m	< 60 pF/m
Resistance	< 110 Ω /km	not specified
Conductor cross-sectional area	$\geq 0,34$ mm ²	$\geq 0,22$ mm ²
Colour of sheath non-IS	Violet	Not specified
Colour of inner cable conductor A (Rx/D/TxD-N)	Green	Not specified
Colour inner cable conductor B (Rx/D/TxD-P)	Red	Not specified

Table from IEC 61158-2-2014

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 Bundles of Cables or Wires) are fulfilled without any additional measures.

Temperature range -40°C + 80°C (PE insulation, SHF1 or SHF2 or SHF2 Mud sheath)
-40°C + 90°C (XLPE insulation, SHF1 or SHF2 or SHF2 Mud sheath)

Touch hazard is normally not expected when working with data communication cables. For safety reasons extra caution must be shown and cable ends be clearly marked if data cables are operated at voltages above 100V.

Type Approval documentation

Tests carried out

Standard	Issued	General description	Limitation
IEC 61158-2	2014-07	Industrial communication networks - Fieldbus specifications - Part 2: Physical layer specification and service definition	Ref table 113 referred above
IEC 60332-1-2	2004-07	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame	
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 < 10µS/mm
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance >60%
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.
NEK TS 606 Ed6	2022	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	SHF2 Mud versions: IRM902 100°C 7d. IRM903 100°C 7d. Calcium Bromide 70°C 56d. EDC 95/11 70°C 56d
IEC 60092-350	2020-01	Electrical installations in ships - Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications Annex E: Cold bend test and impact test for low temperature behaviour	Cold bend: -40°C (8D)

Marking of product

L (meter marking) - Habia Cable bus - size - Part No - YYYY-Www – Plantcode – batchcode – IEC 60332-3-22

Italic = optional when applicable

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) checked (if not available tests according to 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 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