



Certificate no.:
TAE00004WN

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **High Voltage Cable**

with type designation(s)
AMP Shore Connection Cable 6/10kV,

issued to

Far East Cable Co., Ltd
Yixing, China

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Cables for high voltage shore connection (HVSC) systems

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Rated voltage (kV) 6/10 (12)

Temp. class (°C) 90

Issued at **Høvik** on **2024-07-24**

This Certificate is valid until **2029-07-23**.

for **DNV**

DNV local unit: **Jiangyin NB & CMC**

Approval Engineer: **Carsten Hunsalz**

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: 2023-09

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Product description

High Voltage Ship to Shore Connection Cable

Type: AMP 6/10kV Cables with three Power Cores

Power cores: 3 x 25 mm² to 3 x 185 mm²
Conductors: Stranded tinned copper class 5
Cond. Screening: Non-metallic extruded semi-conducting layer
Core insulation: EPR
Insul. Screening: Non-metallic extruded semi-conducting layer

Earth cores: nX(16 mm² to 95 mm²)/n (n=1 or n=2)
Conductors: Stranded tinned copper class 5
Cond. Screening: Non-metallic extruded semi-conducting layer

Pilot elements: 150/250V 4X1,5mm² or 5X2,5mm²
Conductors control cores: Stranded tinned copper class 5
Insulation control cores: HF90

Fibre-elements: 6 optical fibre 62,5/125 in tube, protected with aramid yarns and LSZH outer jacket (combined with pilot elements)

Screen around pilot and fibre- elements: Polyester tape / tinned copper wire braid / polyester tape

Outer sheath: TPU

3×25+2×16/2+4×1.5+6FO(62.5/125)	3×25+1×16+4×1.5+6FO(62.5/125)
3×35+2×25/2+4×1.5+6FO(62.5/125)	3×35+1×25+4×1.5+6FO(62.5/125)
3×50+2×25/2+4×1.5+6FO(62.5/125)	3×50+1×25+4×1.5+6FO(62.5/125)
3×70+2×35/2+4×1.5+6FO(62.5/125)	3×70+1×35+4×1.5+6FO(62.5/125)
3×25+2×16/2+4×2.5+6FO(62.5/125)	3×25+1×16+4×2.5+6FO(62.5/125)
3×35+2×25/2+4×2.5+6FO(62.5/125)	3×35+1×25+4×2.5+6FO(62.5/125)
3×50+2×25/2+4×2.5+6FO(62.5/125)	3×50+1×25+4×2.5+6FO(62.5/125)
3×70+2×35/2+4×2.5+6FO(62.5/125)	3×70+1×35+4×2.5+6FO(62.5/125)
3×95+2×50/2+4×2.5+6FO(62.5/125)	3×95+1×50+4×2.5+6FO(62.5/125)
3×50+2×25/2+5×2.5+6FO(62.5/125)	3×50+1×25+5×2.5+6FO(62.5/125)
3×70+2×35/2+5×2.5+6FO(62.5/125)	3×70+1×35+5×2.5+6FO(62.5/125)
3×95+2×50/2+5×2.5+6FO(62.5/125)	3×95+1×50+5×2.5+6FO(62.5/125)
3×120+2×70/2+5×2.5+6FO(62.5/125)	3×120+1×70+5×2.5+6FO(62.5/125)
3×150+2×95/2+5×2.5+6FO(62.5/125)	3×150+1×95+5×2.5+6FO(62.5/125)
3×185+2×95/2+5×2.5+6FO(62.5/125)	3×185+1×95+5×2.5+6FO(62.5/125)

Type: AMP 6/10kV Cables with single Power Core

Power cores: 1 x 35 mm² to 1 x 185 mm²
Conductors: Stranded tinned copper class 5
Cond. Screening: Non-metallic extruded semi-conducting layer
Core insulation: EPR
Insul. Screening: Non-metallic extruded semi-conducting layer
Screen: Tinned copper wire braid
Outer sheath: TPU

1 × 25	1 × 95
1 × 35	1 × 120
1 × 50	1 × 150
1 × 70	1 × 185

Application/Limitation

Cable according to IEC/ISO/IEEE 80005-1 for high voltage shore connection (HVSC) systems to supply the ship with electrical power from shore.

Please note that IEC/ISO/IEEE 80005-1 (2023) states 6/10 (12) kV as standard voltage for ship to shore connection cables and the cable construction includes three power cores.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
IEC/ISO/IEEE 80005-1	2023-08	Utility connections in port – Part 1: High Voltage Shore Connection (HVSC) Systems – General requirements	Including: -Bending Test -Sunlight-resistance test -Cold bend -40°C -Impact test -35°C -Abrasion test -IRM 902 oil resistant TPU sheath
IEC 60092-350	2020-01	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-354	2020-02	Electrical installations in ships - Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV)	partly
IEC 60092-376	2017-05	Electrical installations in ships – Part 376: Cables for control and instrumentation circuits 150/250 V (300 V)	partly
IEC 60793-2-10	2019-05	Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres	
IEC 60092-360	2021-01	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 60332-1-2	2015-07	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	

Marking of product

Example:

Far East Cable Co., Ltd AMP 6/10kV 3×185+1×95+5×2.5+6FO(62.5/125) IEC/ISO/IEEE 80005-1 - SHORE CONNECTION CABLE. DANGER! HIGH VOLTAGE

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