DNV·GL

Certificate No:
TAE00003DR

TYPE APPROVAL CERTIFICATE

This is to certify:

That the High Voltage Cable

with type designation(s)
TRATOSFLEX AMP 3X185+2X95/2+(5X2,5)C+6FO(62,5/125) 6/10kV

Issued to
Tratos Cavi -S.P.A.-
PIEVE SANTO STEFANO AR, Italy

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

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.
Rated voltage (kV) 6/10
Temp. class (°C) 90

Issued at **Hamburg** on **2019-02-25**
This Certificate is valid until **2024-02-24**.
DNV GL local station: **Genoa**

Approval Engineer: **Carsten Hunsalz**

for **DNV GL**

Arne Schaarmann
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.

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Job Id: **262.1-030184-1**
Certificate No: **TAE00003DR**

Product description

High Voltage Ship to Shore Connection Cable

Type: TRATOSFLEX AMP 3X185+2X95/2+(5X2,5)C+6FO(62,5/125) 6/10kV

Power cores 6/10kV (3 x 185 mm^2)
Conductors: Tinned copper class 5
Cond. Screening: Non-metallic extruded semi-conducting layer
Core insulation: HEPR
Insul. Screening: Non-metallic extruded semi-conducting layer

Earth cores (2 x 95/2 mm^2)
Conductors: Tinned copper class 5
Cond. Screening: Non-metallic extruded semi-conducting layer

Pilot elements 150/250V (5 x 2,5 mm^2)
Conductors control cores: Tinned copper class 5
Insulation control cores: HEPR

Fibre-elements: 6 optical fibre 62,5/125 in tube, protected with layer of kevlar yarn

Screen around pilot and fibre- elements: Separator tape and tinned copper braid

Outer sheath: TMPU

Application/Limitation

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

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
IEC/ISO/IEEE 80005-1	2012-07	Utility connections in port – Part 1: High Voltage Shore Connection (HVSC) Systems – General requirements	
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-354	2014-08	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)	
IEC 60092-376	2017-05	Electrical installations in ships – Part 376: Cables for control and instrumentation circuits 150/250 V (300 V)	
IEC 60793-2-10	2017-08	Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres	

Standard	Release	General description	Limitation
IEC 60092-360	2014-04	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

+TRATOS+ CAVOFLEX AMP Lot/Year 3x185+2X95/2+(5x2,5)C+6FO(62,5/125) 6/10kV IEC/ISO/IEEE 80005-1

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