DNV·GL

Certificate No:
TAE0000259

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
P105 BFOU H-M 0,6/1 kV

Issued to
Controlcavi Industria S.r.l.
FERENTINO, Italy

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.

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) 90

Issued at **Høvik** on **2017-09-26**
This Certificate is valid until **2022-06-30**.
DNV GL local station: **Milan**

Approval Engineer: **Ivar Bull**

for **DNV GL**

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.

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Job Id: **262.1-010304-3**
Certificate No: **TAE0000259**

Product description

Type: P105 BFOU H-M 0,6/1 kV
Construction:

Conductors: Tinned flexible copper class 2 or class 5
Core insulation: Mica tape + EPR
Bedding: Halogen free compound
Metal covering: Tinned copper wire braid
Outer sheath: SHF2 H-M (Oils & Muds resistant)
Tested with Total AZOLLA 68 hydraulic oil.

No of cores:	Cross sectional area [mm^{2}]
1	16 - 300
2	1,5 – 16
3	1,5 - 300
4	1,5 - 120
5, 7, 12, 19, 27, 37	1,5 2,5

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331-1/2.

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

	Release	**General description**	**Limitation**
DNVGL-CP-0399	2016-03	Class Programme Electric cables	
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
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.	Including: Ozone resistance
IEC 60092-353	2016-09	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	
IEC 60228	2004-11	Conductors of insulated cables	
IEC 60331-1/2	2009-05	Fire resistance / Circuit integrity – Test for method for fire with shock at temperature of at least 830ºC for cables rated up to and including 0,6/1 kV	120 min
IEC 60332-1-2	2015-07	Tests on eletric cables under fire conditions. Test for vertical flame propagation for a single insulated wire or cable.	
IEC 60332-3-22	2009-02	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	Bunch test Category A

	Release	General description	Limitation
DNVGL-CP-0399	2016-03	Class Programme Electric cables	
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 < 10µS/mm
IEC 60684-2	2011-08	Flexible insulating sleeving – Part 2: Methods of test.	Fluorine content < 0,1%
IEC 61034-1/2	2013-07 2013-09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%
CSA C22.2 No. 38.05	2007-03	Thermoset Insulated Wires and cables. Cold bending & impact tests	Cold bend: -40°C Cold impact: -40°C
CSA C22.2 No. 0.3-01	2005-01	Test Methods	
NEK 606 Ed.5	2016	Cables for offshore installations halogen-free, low smoke,flame retardant/fire resistant. Technical specification.	
UL 1581	2013-01	Reference Standard for Electrical Wires, Cables, and Flexible Cords. Paragraph 1200.1: Sunlight resistance Carbon arc and Xenon arc test.	720h. Max tensile strenght and elongation@break decay 20%.

Marking of product

CCI– P105 BFOU H-M – size – 0,6/1 kV – IEC 60092-353 – NEK 606 –IEC 60332-3-22 Cat A - IEC 60331-1/2 – Year – Meter mark – QA No.

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