DNV·GL

Certificate No:
TAE00001Y5

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
SPOVEng-FRHF and SPOVPng-FRHF

Issued to
"Azov Cable Company" LLC
Berdyansk, Zaporozhye Region, Ukraine

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

Application :

General power, lighting and control
Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Voltage class (kV) **0,6/1**
Temp. class (°C) **90**

Issued at **Høvik** on **2017-05-23**

This Certificate is valid until **2022-05-22**.
DNV GL local station: **Nikolaev**

Approval Engineer: **Marta Alonso Pontes**

for **DNV GL**

Digitally Signed By: Andreas Kristoffersen
Location: DNV GL Høvik, Norway
Signing Date: 2017-05-23

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.

Job Id: **262.1-022563-1**
Certificate No: **TAE00001Y5**

Product description

Type : SPOVEng-FRHF and SPOVPng-FRHF

Conductors:	Plain, Tinned, stranded copper class 2 or class 5
Core insulation:	Mica tape + HF 90
Inner covering:	Halogen free compound
Metal armour:	Copper wire braid (SPOVEng type) or galvanised steel (SPOVPng type)
Outer sheath:	SHF2

SPOVEng-FRHF:

Number of conductors	Conductors cross-section [mm²]
1	4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150, 185, 240, 300
2, 3, 4	4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150
5	4, 6, 10, 16, 25, 35, 50, 70, 95
1, 2, 3, 4, 5, 7, 10, 12, 14, 16, 19, 24, 27, 30, 33, 37, 48, 52	1, 1.5, 2.5

SPOVPng-FRHF:

Number of conductors	Conductors cross-section [mm²]
2, 3, 4	4, 6, 10, 16, 25, 35, 50, 70, 95, 120, 150
5	4, 6, 10, 16, 25, 35, 50, 70, 95
2, 3, 4, 5, 7, 10, 12, 14, 16, 19, 24, 27, 30, 33, 37, 48, 52	1, 1.5, 2.5

Application/Limitation

This type of cable is fire resistant in accordance with IEC 60331.

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

Documents referred to in approval letters with references:
MCANO381/PONT/262.1-022563-J-34 dated 2016/12/05
MCANO381/PONT/262.1-022563-J-38 dated 2016/12/16
MCANO381/PONT/262.1-022563-J-54 dated 2017/04/28

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-353	2016-09	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	0,6/1
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.	

Standard	Release	General description	Limitation
IEC 60331-1	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 and with an overall diameter exceeding 20 mm	90 min
IEC 60331-21	1999-04	Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to and including 0,6/1,0 kV	180 min
IEC 60332-1-2	2015-07	Tests on electric and optical fibre cables under fire conditions – Part 1-1:Test for vertical flame propagation for a single insulated wire or cable – Apparatus	Flame retardant small scale
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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
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 61034-1/2	2013-06	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance >60%

Marking of product

Azov Cable Company, UA – SPOVEng-FRHF or SPOVPng-FRHF – Size – 0,6/1kV – IEC 60331-1 or IEC 60331-21 – IEC 60332-3-22 – Lot. No, Year of manufacturing, meter.

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