

DNV·GL

Certificate No:
TAE00001Y6

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

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

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.



Form code: TA 251

Revision: 2016-12

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Job Id: 262.1-022563-1
Certificate No: TAE00001Y6

Product description

Type : SPOVEng-HF and SPOVPng-HF

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

SPOVEng-HF:

| Number of conductors | Conductors cross-section [mm ²] |
|--|---|
| 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-HF:

| Number of conductors | Conductors cross-section [mm ²] |
|---|---|
| 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

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. | |
| 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 |



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| Standard | Release | General description | Limitation |
|----------------|---------|---|---|
| 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-HF or SPOVPng-HF – Size – 0,6/1kV – 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

