DNV·GL

Certificate No:
**TAE0000473**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Electric Power Cable**

with type designation(s)
**GAALSHIP MEDIUM MHF VFD 1,8/3kV**

Issued to
**ELETTROTEK KABEL S.p.A**
**Bagnolo in Piano RE, Italy**

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

## Application :

**Armoured and screened power cable for variable frequency drives.**
**Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**
**Rated voltage (kV) 1,8/3**
**Temp. class (°C) 90**

Issued at **Høvik** on **2020-11-25**
This Certificate is valid until **2025-11-24**.
DNV GL local station: **Italy/Malta CMC**

Approval Engineer: **Ivar Bull**

for **DNV GL**

**Marta Alonso Pontes**
**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.



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Job Id: **262.1-034719-1**
Certificate No: **TAE0000473**

## Manufactured by
DNVGL Id: 10675124

## Product description
Type: GAALSHIP MEDIUM MHF VFD 1,8/3kV

Construction:

Conductor: Plain or tinned annealed copper class 2 or 5
Core insulation: XLPE
Inner covering: Halogen free compound
Metal covering: Plain or tinned annealed copper wire braid
EMC Screen: Plain annealed copper tape 100% coverage
Outer sheath: SHF1

| No of cores: | Cross sectional area [mm$^{2]}$ |
|---|---|
| 3 | 10 - 300 |
| 3 + 3E | 50-300 / 10-50 |

## Application/Limitation
VFD application. Halogen free. Low smoke.

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 | 2020-01 | 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. | |
| IEC 60092-353 | 2016-09 | Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV | |
| IEC 60332-3-22 | 2018-07 | Tests on electric 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 +AMD1:2019 CSV | 2019-11 | Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content | Low Halogen: <0,5% Halogen |

| | Release | General description | Limitation |
|---|---|---|---|
| IEC 60754-2:2011 +AMD1:2019 CSV | 2019-11 | Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity | Halogen free: |
| IEC 61034-1/2 | 2013-07<br>2013-09 | Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements | Low smoke<br>Light transmittance ≥60% |
| CSA C22.2 No. 03 | 2009 | 4.12 Flexibility at any specified temperature | Cold bend: -40°C |
| CSA C22.2 No. 03 | 2009 | 4.13 Abnormal low temperature – impact | Cold impact: -35°C |

## Marking of product

ELETTROTEK KABEL GAALSHIP® (cable type) (nominal cross section) SQMM (voltage) (EK item code n°) IEC 60092-353 - IEC 60332-3-22 - (production plant *) (production batch n°) (week of production/year) CE RoHS (meter marking)

*A47 – DNV GL ID 10675124

## 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