DNV·GL

Certificate No:
TAE000017G

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
MarineSignal & MarineSignal+ YOZs 250 V,
Marine(2)Com YOZ(2)c 250 V

Issued to
B.V. Twentsche Kabelfabriek
Haaksbergen, Netherlands

is found to comply with
DNV GL rules for classification – Ships and offshore units
DNV GL class programme DNVGL-CP-0399 – Type approval – Electric cables

Application :

Control and instrumentation.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Type	Voltage class (V)	Temp. class (°C)
MarineSignal & MarineSignal+ YOZs 250 V	250	90
Marine(2)Com YOZ(2)c 250 V	250	90

This Certificate is valid until **2021-06-30**.

Issued at **Høvik** on **2016-07-01**

for **DNV GL**

DNV GL local station: **Rotterdam**

Approval Engineer: **Ivar Bull**

Marit Laumann
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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Product description

MarineSignal & MarineSignal+ YOZs 250 V,
Construction

Conductors: Plain stranded copper class 2
Core insulation: XLPE
Inner covering: Non hygroscopic tape or Halogen free filler (MarineSignal+)
Metal Covering: Tinned or plain copper wire braid
Outer sheath: SHF1

MarineSignal YZs HALOGEN FREE 250 V

No of cores:	Cross sectional area [mm^{2}]
2, 3, 4, 5, 7, 12, 19, 27, 37	0,75 1,0

MarineSignal+ YZs HALOGEN FREE 250 V

No of cores:	Cross sectional area [mm^{2}]
2, 3, 4, 5	0,75 1,0

MarineCom -YOZc 250 V HALOGEN FREE & Marine(2)Com YOZ(2)c HALOGEN FREE 250 V
Construction

Conductors: Plain stranded copper class 2
Core insulation: XLPE
Individual screen: Aluminum foil (2) types only
Inner covering: Non hygroscopic tape
Metal Covering: Tinned or plain copper wire braid
Outer sheath: SHF1

MarineCom -YOZc 250 V HALOGEN FREE & Marine(2)Com YOZ(2)c HALOGEN FREE 250 V

No of cores:	Cross sectional area [mm^{2}]
1 to 27, 30, 32, 37 pairs	0,50, 0,75 1,0 1,5 2,5
1 to 27, 30, 32, 37 triples	0,50, 0,75 1,0 1,5 2,5
1 Quad	0,50, 0,75 1,0 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

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 60092-360	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 60092-376	2003-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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
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	2013-07 2013-09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%

Marking of product

TKF – Size – 250V – MarineSignal YOZs – {batch nr} or
TKF – Size – 250V – MarineSignal+ YOZs – {batch nr} or

TKF – Size – 250V – MarineCom YOZc– {batch nr} or
TKF – Size – 250V – Marine(2)Com YOZ(2)c– {batch nr}

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.

Assessment to be performed at least every second year.

END OF CERTIFICATE