TYPE APPROVAL CERTIFICATE

Certificate No:
TAE00000V1
Revision No:
1

This is to certify:

That the Electric Power Cable

with type designation(s)
MarineLine YZp X-FR 0,6/1 kV,
MarineLine+ YZp X-FR 0,6/1 kV,
Marine(E)Flex YZp X-FR 0,6/1 kV

Issued to
B.V. Twentsche Kabelfabriek
Haaksbergen, **Netherlands**

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

Application :

General power and lighting. Fire resistant.
Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Type	Rated voltage (kV)	Temp. class (°C)
MarineLine YZp X-FR 0,6/1 kV	0,6/1	90
MarineLine+ YZp X-FR 0,6/1 kV	0,6/1	90
Marine(E)Flex YZp X-FR 0,6/1 kV	0,6/1	90

Issued at **Høvik** on **2021-06-09**

This Certificate is valid until **2026-01-06**.

for **DNV**

DNV local station: **Netherlands FIS**

Approval Engineer: **Ivar Bull**

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.

Product description

Types: **MarineLine YZp X-FR 0,6/1 kV,**
MarineLine+ YZp X-FR 0,6/1 kV,
Marine(E)Flex YZp X-FR 0,6/1 kV

Construction:

Conductors: Plain stranded (optional tinned) copper class 2, round or sector shaped or class 5 (MarineFlex)
Core insulation: Mica tape plus XLHFFR (HF90)
Filler: Non hygroscopic tape or Halogen free filler (MarineLine+ and MarineFlex)
Outher sheath: SHF1

Marineline:

No of cores:	Cross sectional area [mm2]
1	1 - 300
2	1 - 300
3	1 - 300
4	1 - 300
5	1 - 300
6-37	1 1,5 2,5

MarineLine+

No of cores:	Cross sectional area [mm2]
1	1,5 - 300
2	1,5 - 300
3	1,5 - 300
4	1,5 - 300
5	1,5 - 300

MarineFlex

No of cores:	Cross sectional area [mm2]
1	10 - 300
2	10 - 300
3	10 - 300
4	10 - 300
5	10 - 300

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publications 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

Standard	Release	General description	Limitation
IEC 60092-350	2020-01	Electrical installations in ships - Part 350: General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-360	2021-01	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	

Standard	Release	General description	Limitation
IEC 60331-1/2	2018-03	Tests for electric cables under fire conditions - Circuit integrity - Part 1: Test method for fire with shock at a temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV	Min 90 min test time.
IEC 60332-3-22	2018-07	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	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
IEC 60754-2	2019-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 60684-2	2011-08	Flexible insulating sleeving – Part 2: Methods of test Clause 45.2 Methods of determination of low levels of fluorine	HCl + HBr + HJ max 0,5% [0,014% can be detected] HF max 0,1% [0,02% can be detected]
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus Part 2: Test procedure and requirements	Low smoke Light transmittance >60%
IEC 60684-2	2011-08	Flexible insulating sleeving – Part 2: Methods of test Clause 45.2 Methods of determination of low levels of fluorine	HF max 0,1% [0,02% can be detected]

Marking of product

TKF- Size - 0,6/1 kV - MarineLine YZp X-FR - HALOGEN FREE – IEC 60331-1/2–IEC 60332-3-22-Lot. No or
TKF- Size - 0,6/1 kV – MarineLine+ YZp X-FR - HALOGEN FREE - IEC 60331-1/2–IEC 60332-3-22 -Lot. No or
TKF- Size - 0,6/1 kV – Marine€Flex YZp X-FR - HALOGEN FREE –IEC 60331-1/2 – IEC 60332-3-22 – Lot. 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