Certificate No:
TAE00004SM

TYPE APPROVAL CERTIFICATE

This is to certify:

That the High Voltage Cable

with type designation(s)
RFOU-E 6/10(12)kV, RFOU-E 12/20(24)kV

Issued to
Prysmian Group Norge AS
DRAMMEN, **Norway**

is found to comply with
NEK TS 606 (2022-03)

Application :

Cable with extra PE sheath for moisture protection can be directly buried underground.
Cable with PE sheath removed is compliant with NEK TS 606.

Type	Rated voltage (kV)	Temp. class (°C)
RFOU-E 6/10(12)kV	6/10(12)	90
RFOU-E 12/20(24)kV	12/20(24)kV	90

Issued at **Høvik** on **2023-10-18**
This Certificate is valid until **2026-06-30**.
DNV local station: **Oslo Maritime and CAP**

Approval Engineer: **Ivar Bull**

for **DNV**

Frederik Tore Elter
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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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.

Product description

Power cables designed according to IEC 60092-354 and NEK TS Ed6 2022 with extra moisture protection sheath.

Type: RFOU-E 6/10(12)kV,
RFOU-E 12/20(24)kV

Construction:

Conductors:	Tinned, stranded copper Class 2
Conductor screen:	Semiconducting compound
Core insulation:	EPR
Insulation screen:	Semiconducting compound
Screen:	Tinned copper wire braid
Tape over screen:	PET tape
Inner covering:	Flame retardant and halogen-free extruded compound
Tape over inner covering:	PET tape
Armour:	Tinned copper wire braid
Tape over armour:	PET tape
Outer sheath:	SHF2 or SHF2 Mud resistant according to IEC 60092-360 Annex D. NEK TS 606.
Additional moisture protection sheath	Low Density Polyethylene

No of cores:	Cross sectional area [mm^{2}]
1	35 – 630

6/10(12)kV

No of cores:	Cross sectional area [mm^{2}]
3	70, 120

Application/Limitation

Cable with extra PE sheath for moisture protection can be directly buried underground. Not flame retardant.
Cable with PE sheath removed is compliant with NEK TS 606.

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 60092-354	2020-02	Electrical installations in ships – Part 354: Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV up to 30 kV.	
IEC 60332-1-2	2015-07	Tests on electric cables under fire conditions. Test for vertical flame propagation for a single insulated wire or cable.	Only with PE outer sheath removed.
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	Only with PE outer sheath removed. Charred portion of sample does not exceed 2,5m above bottom edge of burner

Standard	Release	General description	Limitation
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 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%
NEK TS606 Ed6	2022-03	Cables for offshore installations - halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS). Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. EDC 95/11 70°C 56d

Marking of product

Example of marking on outer PE sheath:
E.g. "meter" "year/week" DRAKA 01 Part no. <SAP-code> RFOU-E 6/10(12) kV 1 x 120/16 mm2 IEC 60092-354 - Production no. <Production order number>

Example of marking on SHF2 Inner sheath:
E.g. "meter" "year/week" DRAKA 01 Part no. <SAP-code> RFOU 12/20(24) kV 1 x 120/16 mm2 IEC 60092-354 - IEC 60332-3-22 Production no. <Production order number>

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the periodical assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and 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.

Survey to be performed at least every second year.

END OF CERTIFICATE