Certificate No:
TAE00004SD

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
BFOU-E(i) & (c) 250 V, BFOU-E (i&c) 250 V, BFCU-E(i) & BFCU-E(c) & BFCU-E(i+c) 250V, BFOU-E XFR (i) & (c) & (i&c) 250 V, BFCU-E XFR (i) & (c) & (i&c) 250 V

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 (V)	Temp. class (°C)
BFOU-E(i) & (c) 250 V	250	90
BFOU-E (i&c) 250 V	250	90
BFCU-E(i) & BFCU-E(c) & BFCU-E(i+c) 250V	250	90
BFOU-E XFR (i) & (c) & (i&c) 250 V	250	90
BFCU-E XFR (i) & (c) & (i&c) 250 V	250	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

Types: BFOU-E(i) & (c) 250 V,
BFOU-E (i&c) 250 V,
BFCU-E(i) & BFCU-E(c) & BFCU-E(i+c) 250V,
BFOU-E XFR (i) & (c) & (i&c) 250 V,
BFCU-E XFR (i) & (c) & (i&c) 250 V

On request: Cold bend -40°C / Cold impact -35°C.

Construction:

Conductors:	Tinned, stranded copper and Mica-tape helically applied directly over the copper conductor
Core insulation:	EPR
Inner covering:	Extruded flame retardant halogen free compound
Metal covering:	Tinned, Copper wire braid (O) or Galvanized steel wire braid (C)
Outer sheath:	SHF2 mud resistant according to IEC 60092-360 Annex D. NEK TS 606.
Additional moisture protection sheath	Low density Polyethylene sheath

BFOU-E/BFCU-E and BFOU-E/BFCU-E-XFR Collective screen (c):

No of Elements:	Cross sectional area [mm^2]
1, 2, 3, 4, 7, 8, 12, 14, 16, 19, 20, 24 pairs	0,75 1,5 2,5 mm^2
1, 2, 4, 8, 12, 16, 19, 24 triples	0,75 1,5 2,5 mm^2
1 quad	0,75 1,5 2,5 mm2

BFOU-E/BFCU-E and BFOU_E/BFCU-E-XFR Individual screen:

No of Elements:	Cross sectional area [mm^2]
1, 2, 3, 4, 7, 8, 12, 14, 16, 19, 20, 24 pairs	0,75 1,5 2,5 mm^2
1, 2, 4, 8, 12, 16, 19, 24 triples	0,75 1,5 2,5 mm^2
1 quad	0,75 1,5 2,5 mm2

BFOU-E/BFCU-E and BFOU-E/BFCU-E-XFR Individual & Collective screen:

No of Elements:	Cross sectional area [mm^2]
1, 2, 3, 4, 7, 8, 12, 14, 16, 19, 20, 24 pairs	0,75 1,5 2,5 mm^2
1, 2, 4, 8, 12, 16, 19, 24 triples	0,75 1,5 2,5 mm^2
1 quad	0,75 1,5 2,5 mm2

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.
This type of cable is fire resistant in accordance with IEC Publication 60331.

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 60092-376	2017-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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	120 minutes @830 ºC + 15 minutes cooling down

		cables of rated voltage up to and including 0,6/1,0 kV	
IEC 60331-21	1999-04	Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to and including 0,6/1,0 kV	180 min. test @1000ºC + 15 minutes cooling down
IEC 60332-1-2:2004+AMD1:2015	2004	Tests on electric and optical fibre cables under fire conditions - Part 1-2: Test for vertical flame propagation for a single insulated wire or cable - Procedure for 1 kW pre-mixed flame	Only with PE outer sheath removed. Flame retardant small scale
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
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

On special request (-XFR): After Fire test IEC 60331-1/2

EN50200 Annex E	2006-05	Method of test for resistance to fire of unprotected small cables for use in emergency circuits. The standard also includes in Annex E a means of applying water spray to the cable during the test.	Water spray for 15 minutes
BS 8491	2008	Method for assessment of fire integrity of large diameter power cables for use as components for smoke and heat control systems and certain other active fire safety systems	Water jet, 12,5 l/min: 5x5sec
		Water submersion	15 min.

On special request: Arctic Grade

IEC 60092-350	2014-08	Annex E: Cold bend test and impact test for low temperature behaviour	Cold bend: -40°C Cold impact: -35°C
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

Example of marking on outer PE sheath:
METER" <YYWW> DRAKA 01 PART NO. <ART.NR> BFOU-E(I) 250V 16 Pair 0.75 MM2 IEC 60092-376/ DRAKA PRODUCTION NO. <PROD.ORDRE.NR>

Example of marking on SHF2 Inner sheath:
"meter" "year" "week "DRAKA 01 "Part no" BFOU-E (i) – size – 150/250 V – IEC 60331 – IEC 60332-3-22 – IEC 60092-376 "Prod. Order 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.

Assessment to be performed at least every second year.

END OF CERTIFICATE