

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

**That the Electric Power Cable**

with type designation(s)  
**BFOU P5/P12 0,6/1 kV, BFCU 0,6/1 kV**

Issued to

**Draka Norsk Kabel - part of the Prysmian Group**  
**DRAMMEN, Norway**

is found to comply with

**Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards**  
**IEC 60092-350 (2014-08)**  
**IEC 60092-353 (2011-08)**  
**IEC 60331-1/2 (2009-05)**  
**IEC 60331-21 (1999-04)**  
**IEC 60332-3-22 (2009-02)**  
**IEC 60754-1/2 (2011-11)**  
**IEC61034-1/2 (2005-04/2005-04)**  
**NEK TS 606 (2009-05) (P-types only)**

**Application :**

**General power and lighting. Control.**

**Fire resistant. Flame retardant in bunch Cat. A. Halogen free. Low smoke. Mud resistant.**  
**On request: Cold bend -40°C / Cold impact -35°C.**

Type	Voltage class (kV)	Temp. class (°C)
<b>BFOU P5/P12 0,6/1 kV</b>	<b>0,6/1</b>	<b>90</b>
<b>BFCU 0,6/1 kV</b>	<b>0,6/1</b>	<b>90</b>

This Certificate is valid until **2016-06-30**.

Issued at **Høvik** on **2014-10-15**

for **DNV GL**

DNV GL local station: **Oslo**

Approval Engineer: **Ivar Bull**

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**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. If any person suffers loss or damage which is proven to have been caused by any negligent act or omission of the Society, then the Society shall pay compensation to such person for his proven direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question. The maximum compensation shall never exceed USD 2 million. In this provision the "Society" shall mean DNV GL AS as well as all its direct and indirect owners, affiliates, subsidiaries, directors, officers, employees, agents and any other person or entity acting on behalf of DNV GL AS.

Certificate No: **E-11343**  
 File No: **827.10**  
 Job Id: **262.1-002558-6**

## Product description

Type: BFOU P5/P12 0,6/1 kV & BFCU 0,6/1 kV

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 Galv. Steel wire braid (C)

Outer sheath: SHF2 Mud resistant according to IEC 60092-360 Annex D. NEK TS 606.

BFOU P5/P12 0,6/1 kV, BFCU 0,6/1 kV:

Number of cores x conductor cross-section mm <sup>2</sup>	Number of cores x conductor cross-section mm <sup>2</sup>	Number of cores x conductor cross-section mm <sup>2</sup>	Number of cores x conductor cross-section mm <sup>2</sup>
1 x 16*	2 x 2,5	4 x 10	3G x 50
1 x 25*	3G x 2,5	3G x 10	2 x 70
1 x 35*	3 x 2,5	4G x 10	3 x 70
1 x 50*	4G x 2,5	5G x 10	4 x 70
1 x 70*	4 x 2,5	2 x 16	4G x 70
1 x 95*	5 x 2,5	3 x 16	5G x 70
1 x 120*	7 x 2,5	4 x 16	3G x 70
1 x 150*	8G x 2,5	3G x 16	5 x 70
1 x 185*	12 x 2,5	5 x 16	2 x 95
1 x 240*	19 x 2,5	5G x 16	3 x 95
1 x 300*	27 x 2,5	4G x 16	4 x 95
1 x 400*	37 x 2,5	2 x 25	4G x 95
1 x 500*	5G x 2,5	3 x 25	5G x 95
1 x 630*	4G x 4	4 x 25	3G x 95
2 x 1,5	5G x 4	4G x 25	2 x 120
3G x 1,5	2 x 4	5G x 25	3 x 120
4G x 1,5	3 x 4	3G x 25	4 x 120
3 x 1,5	4 x 4	2 x 35	3 x 150
4 x 1,5	5 x 4	3 x 35	4G x 120
5 x 1,5	3G x 4	4 x 35	2 x 150
7 x 1,5	2 x 6	3G x 35	4 x 150
12 x 1,5	3 x 6	4G x 35	4G x 150
19 x 1,5	4 x 6	5G x 35	5G x 150
27 x 1,5	3G x 6	2 x 50	3 x 185
37 x 1,5	4G x 6	3 x 50	4 x 185
5G x 1,5	5G x 6	4 x 50	2 x 240
32 x 1,5	2 x 10	5G x 50	3 x 240
7G x 2,5	3 x 10	4G x 50	

\*) Not manufactured as BFCU

## Application/Limitation

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

The requirements of SOLAS Amendments Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bundles of Cables or Wires) are fulfilled without any additional measures.

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**Type Approval documentation**

Data sheet: **BFOU 1kV\_2014**  
**BFOU 1kV\_Arctic 2014**

Test Reports.

**Tests carried out**

Standard	Issued	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
<i>IEC 60092-353</i>	<i>2011-08</i>	<i>Single and multicore non-radial field power cables with extruded solid insulation for rated Voltages of 1 kV and 3 kV</i>	
IEC 60092-360	2014-04	Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables	
<i>IEC 60331-21</i>	<i>1999-04</i>	<i>Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to 0,6/1,0 kV</i>	<i>90 min. test @750 °C</i>
IEC 60331-1/2	2009-05	Fire resistance / Circuit integrity – Test for method for fire with shock at temperature of at least 830°C for cables rated up to and including 0,6/1kV	Minimum 90 min. test.
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 – Determination of the amount of halogen acid gas	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS
IEC 61034-1/2	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke
NEK TS 606 Ed. 4	2009-05	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	

**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

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### **Marking of product**

DRAKA NORSK KABEL or DRAKA 01 or Prysmian 01 – meter – year - BFOU P5/P12 – ARCTIC GRADE (optional) – size - 0,6/1 kV – IEC 60331 – IEC 60332-3-22 or

DRAKA NORSK KABEL or DRAKA 01 or Prysmian 01 – meter – year - BFCU - ARCTIC GRADE (optional) – size - 0,6/1 kV – IEC 60331 – IEC 60332-3-22.

### **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 survey 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