DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-8374
This Certificate consists of 5 pages

This is to certify that the

High Voltage Cable

with type designation(s)

RFOU P2/P9 3,6/6 kV, RFOU P3/P10 6/10 kV, RFOU P4/P11 8,7/15 kV, RFOU P19/P21 12/20 kV

Holder of certificate

Draka Marine, Oil & Gas International
Houston, TX 77032, United States

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards
IEC 60092-354 (2003-06)
IEC 60332-3-22 (2000-10)
IEC 60754-1 (1994-01)
IEC 60754-2 (1997-04)
IEC 61034-2 (2005-04)
NEK 606 (2004)

Application

General power. Halogen free. Low smoke. Mud resistant.

Type	Voltage (kV)	Temp. class (°C)
RFOU P2/P9 3,6/6 kV	3,6/6	90
RFOU P3/P10 6/10 kV	6/10	90
RFOU P4/P11 8,7/15 kV	8,7/15	90
RFOU P19/P21 12/20 kV	12/20	90

Place and date
Høvik, 2007-05-11
for DET NORSKE VERITAS AS

Frode Berntsen
Head of Section

Local Office
DNV Oslo

This Certificate is valid until
2011-06-30

Ivar Bull
Surveyor

Notice: 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.

Name and place of manufacturer:

Draka Norsk Kabel AS
Drammen, Norway

Product description

Construction:

Conductors:	Tinned, stranded copper
Core insulation:	EPR
Screening:	Tinned copper wire braid
Filler:	Flame retardant halogen-free thermoset compound
Metal covering:	Tinned copper wire braid
Outer sheath:	SHF2 SHF Mud

Type: RFOU P2/P9 3,6/6 kV

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
1 x 35	26,0 ± 1,5
1 x 50	28,0 ± 1,5
1 x 70	29,0 ± 1,5
1 x 95	31,0 ± 2,0
1 x 120	33,0 ± 2,0
1 x 150	35,0 ± 2,0
1 x 185	37,0 ± 2,0
1 x 240	39,0 ± 2,0
1 x 300	43,0 ± 2,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 25	46,5 ± 2,5
3 x 35	48,5 ± 2,5
3 x 50	52,5 ± 2,5
3 x 70	55,5 ± 2,5
3 x 95	61,0 ± 3,0
3 x 120	64,5 ± 3,0
3 x 150	68,0 ± 3,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 25 + E	53,0 ± 3,0
3 x 35 + E	55,0 ± 3,0
3 x 50 + E	58,0 ± 3,0
3 x 70 + E	63,0 ± 3,5
3 x 95 + E	68,0 ± 3,5
3 x 120 + E	72,0 ± 4,0
3 x 150 + E	77,0 ± 4,0

Type: RFOU P3/P106/10 kV

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
1 x 35	27,0 ± 1,5
1 x 50	29,0 ± 1,5
1 x 70	31,0 ± 2,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
1 x 95	32,0 ± 2,0
1 x 120	34,0 ± 2,0
1 x 150	36,0 ± 2,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
1 x 185	38,0 ± 2,0
1 x 240	41,0 ± 2,0
1 x 300	44,5 ± 2,5

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 25	47,5 ± 2,5
3 x 35	50,5 ± 2,5
3 x 50	55,5 ± 2,5
3 x 70	58,5 ± 2,5
3 x 95	63,0 ± 3,0
3 x 120	67,5 ± 3,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 150	70,0 ± 3,0
3 x 25 + E	54,0 ± 3,0
3 x 35 + E	58,0 ± 3,0
3 x 50 + E	61,0 ± 3,0
3 x 70 + E	66,0 ± 3,5
3 x 95 + E	70,0 ± 3,5

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 120 + E	75,0 ± 4,0
3 x 150 + E	80,0 ± 4,0

Type: RFOU P4/P11 8,7/15 kV

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
1 x 25	28,0 ± 1,5
1 x 35	29,0 ± 1,5
1 x 50	32,0 ± 2,0
1 x 70	34,0 ± 2,0
1 x 95	35,0 ± 2,0
1 x 120	36,0 ± 2,0
1 x 150	39,0 ± 2,0
1 x 185	40,0 ± 2,0
1 x 240	43,5 ± 2,5

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
1 x 300	46,5 ± 2,5
3 x 25	53,5 ± 2,5
3 x 35	56,5 ± 2,5
3 x 50	60,0 ± 3,0
3 x 70	64,5 ± 3,0
3 x 95	69,0 ± 3,0
3 x 120	72,0 ± 3,0
3 x 150	76,0 ± 3,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 25 + E	60,0 ± 3,0
3 x 35 + E	63,0 ± 3,5
3 x 50 + E	68,0 ± 3,5
3 x 70 + E	72,0 ± 4,0
3 x 95 + E	77,0 ± 4,0
3 x 120 + E	81,0 ± 4,0
3 x 150 + E	85,0 ± 4,0

RFOU P19/P20 12/20 kV

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
1 x 35	32,0 +/-2,0
1 x 50	33,5 +/-2,0
1 x 70	36,0 +/-2,0
1 x 95	37,5 +/-2,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
1 x 120	40,0 +/-2,5
1 x 150	41,0 +/-2,5
1 x 185	44,0 +/-2,5
1 x 240	47,0 +/-2,5

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 35	64,0 +/-3,5
3 x 50	69,0 +/-3,5
3 x 70	73,0 +/-4,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 95	77,0 +/-4,0
3 x 120	81,0 +/-4,5
3 x 150	83,0 +/-4,5
3 x 185	86,0 +/-4,5
3 x 240	94,0 +/-5,0

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 25 + E	54,0 +/-3,0
3 x 35 + E	58,0 +/-3,0
3 x 50 + E	61,0 +/-3,0
3 x 70 + E	66,0 +/-3,5

Number of cores x conductor cross-section	Overall diameter
mm^2	mm
3 x 95 + E	70,0 +/-3,5
3 x 120 + E	75,0 +/-4,0
3 x 150 + E	80,0 +/-4,0

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

Data sheets: Draka RFOU_24kV dated 2004-02-13.
Test reports

Tests carried out

Type tested according to:
Standard cable: IEC 60092-354, IEC 60332-3-22, IEC 60754-1/2, IEC 61034-1/2 and NEK 606 (2004).

On special request: Cold bend (-40 °C)/impact (-35 °C) test: CSA C 22.2 No 0.3-M1985.

Marking of product

To be marked: DRAKA NORSK KABEL or DRAKA 01 - RFOU - size – P2/P9 3,6/6 kV or P3/P10 6/10 kV or P4/P11 8,7/15 kV or P19/P20 12/20 kV

Certificate retention survey

The scope of the retention/renewal survey 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