



DNV

DET NORSKE VERITAS TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. E-8735

This Certificate consists of 4 pages

This is to certify that the

Low Voltage Cable

with type designation(s)

U-HFAT m, U-HFAT m (I), U-HFAT m (C), U-HFAT m (I+C)

Manufactured by

Unika Universal Kablo San. ve Tic. A.S.

ISTANBUL, Turkey

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

IEC 60092-376 (2003-05)

IEC 60332-3-22 (2000-10)

IEC 60754-1 (1994-01)

IEC 60754-2 (1997-04)

IEC 61034-2 (2005-04)

Application

Instrumentation, Control and Communication. Screened. Twisted. Halogen free. Low smoke.

Type	Voltage class (V)	Temp. class (°C)
U-HFAT m	250	90
U-HFAT m (I)	250	90
U-HFAT m (C)	250	90
U-HFAT m (I+C)	250	90

Place and date

Høvik, 2009-03-06

for DET NORSKE VERITAS AS



This Certificate is valid until

2011-12-31

Trond Sjøvåg
Trond Sjøvåg
Head of Section

Local Office
DNV Istanbul

Ivar Bull
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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



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 File No.: 827.20
 Job Id.: 262.1-003326-3

Product description

Type: U-HFAT m & U-HFAT m (C) & U-HFAT m (I) & U-HFAT m (I+C) 250 V
 Construction:
 Conductors: Tinned stranded copper class 2 or class 5
 Core insulation: XLPE
 Screen: Metal coated polyester tape w/plain or tinned copper drain wire (C) or (I) or (I+C)
 Inner covering: Tape
 Metal covering: Plain or tinned copper wire braid
 Outer sheath: SHF1

Number of cores x conductor cross-section mm ²	Overall Diameter ±10 % mm
1 x 2 x 0,5	6,5
1 x 2 x 0,75	7,3
1 x 2 x 1,0	7,7
1 x 2 x 1,5	8,9
1 x 2 x 2,5	9,7
1 x 3 x 0,5	6,8
1 x 3 x 0,75	7,7
1 x 3 x 1,0	8,0
1 x 3 x 1,5	9,3
1 x 3 x 2,5	10,2
1 x 4 x 0,5	7,2
1 x 4 x 0,75	8,2
1 x 4 x 1,0	8,8
1 x 4 x 1,5	10,1
1 x 4 x 2,5	11,3
2 x 2 x 0,5	7,4
2 x 2 x 0,75	8,4
2 x 2 x 1,0	8,8
2 x 2 x 1,5	10,3
2 x 2 x 2,5	11,3
2 x 3 x 0,5	9,5

Number of cores x conductor cross-section mm ²	Overall Diameter ±10 % mm
2 x 3 x 0,75	10,9
2 x 3 x 1,0	11,8
2 x 3 x 1,5	14,2
2 x 3 x 2,5	15,7
2 x 4 x 0,5	10,5
2 x 4 x 0,75	12,2
2 x 4 x 1,0	13,6
2 x 4 x 1,5	15,9
2 x 4 x 2,5	17,8
3 x 2 x 0,5	9,5
3 x 2 x 0,75	10,9
3 x 2 x 1,0	11,8
3 x 2 x 1,5	14,2
3 x 2 x 2,5	15,7
3 x 3 x 0,5	10,2
3 x 3 x 0,75	12,1
3 x 3 x 1,0	12,8
3 x 3 x 1,5	15,4
3 x 3 x 2,5	17,3
3 x 4 x 0,5	11,3
3 x 4 x 0,75	13,8

Number of cores x conductor cross-section mm ²	Overall Diameter ±10 % mm
3 x 4 x 1,0	14,6
3 x 4 x 1,5	17,1
3 x 4 x 2,5	19,2
4 x 2 x 0,5	10,3
4 x 2 x 0,75	12,2
4 x 2 x 1,0	13,0
4 x 2 x 1,5	15,7
4 x 2 x 2,5	17,6
4 x 3 x 0,5	11,3
4 x 3 x 0,75	13,2
4 x 3 x 1,0	14,6
4 x 3 x 1,5	17,1
4 x 3 x 2,5	19,0
4 x 4 x 0,5	12,4
4 x 4 x 0,75	15,2
4 x 4 x 1,0	16,3
4 x 4 x 1,5	19,1
4 x 4 x 2,5	21,5
5 x 2 x 0,5	10,0
5 x 2 x 0,75	11,8
5 x 2 x 1,0	12,5



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Number of cores x conductor cross-section mm ²	Overall Diameter ±10 % mm
5 x 2 x 1,5	15,1
5 x 2 x 2,5	16,9
5 x 3 x 0,5	12,7
5 x 3 x 0,75	15,5
5 x 3 x 1,0	16,6
5 x 3 x 1,5	19,5
5 x 3 x 2,5	22,0
5 x 4 x 0,5	14,4
5 x 4 x 0,75	17,1
5 x 4 x 1,0	18,2
5 x 4 x 1,5	21,5
5 x 4 x 2,5	24,4
7 x 2 x 0,5	11,2
7 x 2 x 0,75	13,0
7 x 2 x 1,0	14,4
7 x 2 x 1,5	16,9
7 x 2 x 2,5	19,0
7 x 3 x 0,5	12,4
7 x 3 x 0,75	15,1
7 x 3 x 1,0	16,1
7 x 3 x 1,5	19,0
7 x 3 x 2,5	21,3
7 x 4 x 0,5	16,6
7 x 4 x 0,75	19,8

Number of cores x conductor cross-section mm ²	Overall Diameter ±10 % mm
7 x 4 x 1,0	21,1
7 x 4 x 1,5	25,2
7 x 4 x 2,5	28,4
8 x 2 x 0,75	21,0
10 x 2 x 0,5	14,7
10 x 2 x 0,75	17,4
10 x 2 x 1,0	18,6
10 x 2 x 1,5	22,1
10 x 2 x 2,5	24,9
10 x 3 x 0,5	16,4
10 x 3 x 0,75	19,6
10 x 3 x 1,0	20,9
10 x 3 x 1,5	24,8
10 x 3 x 2,5	28,0
12 x 2 x 0,5	15,7
12 x 2 x 0,75	18,7
12 x 2 x 1,0	20,1
12 x 2 x 1,5	23,7
12 x 2 x 2,5	26,8
12 x 3 x 0,75	26,0
16 x 2 x 0,5	17,4
16 x 2 x 0,75	20,8
16 x 2 x 1,0	22,4

Number of cores x conductor cross-section mm ²	Overall Diameter ±10 % mm
16 x 2 x 1,5	26,4
16 x 2 x 2,5	30,1
19 x 2 x 0,5	18,2
19 x 2 x 0,75	22,2
19 x 2 x 1,0	23,5
19 x 2 x 1,5	28,0
19 x 2 x 2,5	31,6
24 x 2 x 0,5	20,6
24 x 2 x 0,75	24,4
24 x 2 x 1,0	26,3
24 x 2 x 1,5	31,4
24 x 2 x 2,5	36,1
27 x 2 x 0,5	21,7
27 x 2 x 0,75	26,3
27 x 2 x 1,0	28,2
27 x 2 x 1,5	33,7
27 x 2 x 2,5	38,7
37 x 2 x 0,5	24,2
37 x 2 x 0,75	29,3
37 x 2 x 1,0	31,6
37 x 2 x 1,5	38,3
37 x 2 x 2,5	43,6

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.



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Type Approval documentation

Data sheets and drawings:

Data sheet and drawing U-HFAT m
Data sheet and drawing U-HFAT m (I)
Data sheet and drawing U-HFAT m (C)
Data sheet and drawing U-HFAT m (I+C)

Test reports:

IEC60332-3 Cat A dated 28.09.2007.
Electrical and physical routine test report No. 08240 dated 28.09.2007.

Tests carried out

Type test according to IEC 60092-376, IEC 60332-3-22, IEC 60754-1/2, IEC 61034-1/2.

Marking of product

Product to be marked: UNIKA KABLO - U-HFAT m or U-HFAT m (I) or U-HFAT(I+C) - size - 250V

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