



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

**CERTIFICATE NO. E-8561**  
This Certificate consists of 4 pages

*This is to certify that the*  
**Electric Cable, Power Current**  
*with type designation(s)*  
**HXXMB FR 0,6/1 kV**


*Manufactured by*  
**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 60092-353 (2001-04)  
IEC 60331-21 (1999-04)  
IEC 60332-3-22 (2000-10)  
IEC 60754-1 (1994-01)  
IEC 60754-2 (1997-04)  
IEC 61034-2 (2005-04)

*Application*  
General power and lighting. Control. Halogen free. Low smoke. Enhanced insulation according to IEC 60092-353 Annex A.

Voltage class (kV)	0,6/1
Temp. class (°C)	90

*Place and date*  
Høvik, 2008-01-21  
for DET NORSKE VERITAS AS

  
Marit Laumann  
Head of Section



*Local Office*  
DNV Rotterdam

*This Certificate is valid until*  
2010-12-31

  
Erik Hoffmann *Nabst*  
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.: 827.10

### Name and place of manufacturer

Draka Kabel B.V.  
Amsterdam  
Netherlands

### Product description

Type: HXXMB FR 0,6/1 kV

Conductors: Plain stranded copper (class 2 or class 5  $\geq 35 \text{ mm}^2$ )  
Core insulation: Mica tape + XLPE or HF XLPE  
Inner sheath: SHF1  
Metal covering: Bronze wire braid  
Outer sheath: SHF1

Number of cores x conductor cross-section mm <sup>2</sup>	Nominal overall diameter class 2 mm	Nominal overall diameter class 5 mm
1 x 1,5	10,0	
1 x 2,5	10,5	
1 x 4	11,2	
1 x 6	11,7	
1 x 10	13,1	
1 x 16	14,6	
1 x 25	16,4	
1 x 35	17,3	18,4
1 x 50	21,3	22,9
1 x 70	23,7	25,6
1 x 95	25,8	27,5
1 x 120	29,1	30,6
1 x 150	31,8	33,4
1 x 185	34,1	35,2
1 x 240	38,0	39,4
1 x 300	41,1	42,6
2 x 1,5	15,6	
2 x 2,5	16,8	
2 x 4	18,8	
2 x 6	20,1	
2 x 10	22,6	
2 x 16	25,9	
2 x 25	29,5	
2 x 35	31,2	33,7

Number of cores x conductor cross-section mm <sup>2</sup>	Nominal overall diameter class 2 mm	Nominal overall diameter class 5 mm
2 x 50	34,8	38,5
2 x 70	39,8	43,6
2 x 95	44,2	47,6
3 x 1,5	16,4	
3 x 2,5	17,5	
3 x 4	19,7	
3 x 6	21,1	
3 x 10	23,9	
3 x 16	27,0	
3 x 25	31,1	
3 x 35	33,1	35,8
3 x 50	36,9	40,4
3 x 70	42,0	46,5
3 x 95	47,1	50,8
3 x 120	53,5	57,0
3 x 150	58,4	61,9
3 x 185	63,4	66,3
3 x 240	71,1	74,1
4 x 1,5	17,7	
4 x 2,5	18,9	
4 x 4	20,9	
4 x 6	22,2	
4 x 10	26,0	



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Number of cores x conductor cross-section mm <sup>2</sup>	Nominal overall diameter class 2 mm	Nominal overall diameter class 5 mm
4 x 16	29,6	
4 x 25	33,9	
4 x 35	36,8	39,6
4 x 50	40,3	44,3
4 x 70	46,2	51,2
4 x 95	51,9	56,0
4 x 120	59,0	62,9
4 x 150	64,3	68,2
24 x 1,0	31,2	
5 x 1,5	19,4	
6 x 1,5	19,9	
7 x 1,5	20,0	
8 x 1,5	21,4	
12 x 1,5	25,3	
20 x 1,5	31,2	
24 x 1,5	34,6	

Number of cores x conductor cross-section mm <sup>2</sup>	Nominal overall diameter class 2 mm	Nominal overall diameter class 5 mm
30 x 1,5	37,1	
37 x 1,5	39,9	
5 x 2,5	20,6	
6 x 2,5	21,2	
7 x 2,5	21,3	
8 x 2,5	23,2	
10 x 2,5	26,5	
12 x 2,5	27,5	
19 x 2,5	32,3	
20 x 2,5	34,1	
24 x 2,5	37,9	
30 x 2,5	40,3	
36 x 2,5	43,4	
5 x 4	23,0	
13 x 6	35,8	

### 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 Bunches of Cables or Wires) are fulfilled without any additional measures.

### Type Approval documentation

Data sheets: HXXM(B)(FR)EEP.xls-RH1998-001 dated 98-11-06  
RD/NC/9811A dated 98-04-22 updated 98-09-28

Test reports: Intertek Testing Services no. J98\*16608-001 Appendix A dated 98-08-06 and ITS letter report with oil test results, dated December 2, 2002  
Draka 021/03-052 dated 2003-03-06 and ITS report crush resistance and impact test dated 2003-05-02.

### Tests carried out

Type tests according to IEC 60092-3, IEC 60092-353, IEC 60331-21 (at 1000 °C), IEC 60332-3-22, IEC 60754-1/2, Mil-C-24643A cl. 4.7.25 and cl. 4.7.26, IEC 61034-1/2, IEEE



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Std-45, NES 711, Mil-C-24643A cl. 4.7.27, NES 713, Mil-C-24643A cl. 4.7.29, CSA C22.2 No 0.3 (cold bend – 40 °C, cold impact – 35 °C), IEEE 45 par 8.13.7 oil test and UL 1581 sect. 1200 and crush and impact test UL 1277, UL 2225, UL 1569.

### Marking of product

Product marking: DRAKA 02 or 03 - HXXMB FR - size - 0,6/1 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