



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **E-12219**

This is to certify that the  
**Low Voltage Cable**

with type designation(s)  
**AFITOX SM BMBC/SM BMCBC/SM BMIS/SM BMCS & SM BC 150/250 V**

Manufactured by  
**NEXANS BRASIL S/A.**  
**Rio de Janeiro RJ, Brazil**

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 (2009-02)  
IEC 60331-21 (1999-04)  
IEC 60754-1/2 (2011-11)  
IEC61034-1/2 (2005-04/2005-04)

Application  
**Instrumentation and communication**  
**Fire resistant**  
**Flame retardant in bunch; cat A**  
**Halogen free**  
**Low smoke**

**Voltage class (V) 150/250**  
**Temp. class (°C) 90**

This Certificate is valid until **2016-12-31**.

Issued at **Høvik** on **2013-01-23**

DNV local station: **Rio de Janeiro, SiO**

Approval Engineer: **Kjersti Bakke**

for **Det Norske Veritas AS**

**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 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.

## Product description

AFITOX SM BMIBC & SM BMCBC & SM BMIS & SM BMCS & SM BC 150/250 V  
 AFITOX SM BMIBC-F & SM BMCBC-F & SM BMIS-F & SM BMCS-F & SM BC-F 150/250 V

Conductors: Tinned or Plain, stranded copper class 2 or class 5(-F)  
 Core insulation: Mica tape + HF-XLPE  
 Screen: Al/polyester tape  
 Inner covering: Thermoplast  
 Metal covering: Galv. Steel or plain or tinned copper wire braid  
 Outer sheath: SHF1

Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter Nominal (individual) mm	Overall diameter Nominal (collective) mm
1 x 2 x 0,75	12,5	-
1 x 2 x 1,0	-	12,5
2 x 2 x 1,0	19,5	17,0
3 x 2 x 1,0	20,5	18,0
4 x 2 x 1,0	22,0	19,5
6 x 2 x 1,0	26,5	22,5
7 x 2 x 1,0	26,5	22,5
8 x 2 x 1,0	30,0	24,5
10 x 2 x 1,0	33,5	28,5
12 x 2 x 1,0	34,5	29,0
14 x 2 x 1,0	36,0	31,0
16 x 2 x 1,0	38,0	32,5
18 x 2 x 1,0	40,5	34,0
19 x 2 x 1,0	40,5	34,0
20 x 2 x 1,0	44,5	36,5
24 x 2 x 1,0	48,0	40,5
30 x 2 x 1,0	51,0	43,0
1 x 3 x 1,0	-	13,0
3 x 3 x 1,0	21,5	21,0
4 x 3 x 1,0	23,5	22,5
7 x 3 x 1,0	28,0	26,5
10 x 3 x 1,0	35,0	34,0
14 x 3 x 1,0	38,0	36,5
19 x 3 x 1,0	43,0	41,5

Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter Nominal (individual) mm	Overall diameter Nominal (collective) mm
1 x 2 x 1,5	-	13,0
2 x 2 x 1,5	20,5	18,0
3 x 2 x 1,5	21,5	19,0
4 x 2 x 1,5	23,5	20,5
6 x 2 x 1,5	28,0	24,0
7 x 2 x 1,5	28,0	24,0
8 x 2 x 1,5	32,0	26,5
10 x 2 x 1,5	35,5	30,5
12 x 2 x 1,5	36,5	31,5
14 x 2 x 1,5	38,5	33,0
16 x 2 x 1,5	41,0	34,5
18 x 2 x 1,5	44,0	37,0
19 x 2 x 1,5	44,0	37,0
20 x 2 x 1,5	48,0	39,5
24 x 2 x 1,5	51,5	37,7
30 x 2 x 1,5	55,0	46,0
1 x 3 x 1,5	-	13,5
3 x 3 x 1,5	23,0	22,0
4 x 3 x 1,5	25,0	24,0
7 x 3 x 1,5	29,5	28,5
10 x 3 x 1,5	37,5	36,0
14 x 3 x 1,5	41,0	39,5
19 x 3 x 1,5	46,5	45,0

Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter Nominal (individual) mm
SM BC	
1 x 2 x 1,5	13,5
3 x 2 x 1,5	19,5
5 x 2 x 1,5	23,5

Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter Nominal (individual) mm
7 x 2 x 1,5	25,5
8 x 2 x 1,5	27,0
12 x 2 x 1,5	32,5
20 x 2 x 1,5	40,5

## 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 sheet: FICAP Gt-2008/08/21 Rev.9 dated 2008-08-21

Test reports: FICAP RE 0865 dated 2008-08-13

## Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2008-02	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-351	2004-04	Insulating materials for shipboard and offshore units, power, control, instrumentation, telecommunication and data cables	
IEC 60092-359	1999-08	Sheathing materials for shipboard power and telecommunication cables	
IEC 60092-376	2003-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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	Minimum 90 min. flame application + 15 min. cooling period.
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 - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Light transmittance > 60%

## Marking of product

For class 2 conductors

NEXANS FICAP - AFITOX SM BMIBC or SM BMCBC or SM BMIS or SM BMCS or SM BC - Size – 150/250 V – IEC 60332-3-22

For class 5 conductors

NEXANS FICAP - AFITOX SM BMIBC-F or SM BMCBC-F or SM BMIS-F or SM BMCS-F or SM BC-F - Size – 150/250 V – IEC 60332-3-22

### **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 shall be performed at least every second year.

END OF CERTIFICATE