



DET NORSKE VERITAS

TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **E-12224**

This is to certify that the
High Voltage Cable

with type designation(s)

AFITOX MXP BC/MXP S 3,6/6 kV, AFITOX MXP BC/MXP S 6/10 kV, AFITOX MXP BC/MXP S 8,7/15 kV, AFITOX MXP BC/MXP S 12/20 kV

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 60092-354 (2003-06)

IEC 60332-3-22 (2009-02)

IEC 60754-1/2 (2011-11)

IEC61034-1/2 (2005-04/2005-04)

Application

High voltage cable
Flame retardant in bunch; cat A
Halogen free
Low smoke

Type	Voltage (kV)	Temp. class (°C)
AFITOX MXP BC/MXP S 3,6/6 kV	3,6/6	90
AFITOX MXP BC/MXP S 6/10 kV	6/10	90
AFITOX MXP BC/MXP S 8,7/15 kV	8,7/15	90
AFITOX MXP BC/MXP S 12/20 kV	12/20	90

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

Issued at **Høvik** on **2013-01-23**

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

for **Det Norske Veritas AS**

Approval Engineer: **Kjersti Bakke**

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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 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 MXP BC/MXP S 3,6/6 kV, AFITOX MXP BC/MXP S 6/10 kV, AFITOX MXP BC/MXP S 8,7/15 kV, AFITOX MXP BC/MXP S 12/20 kV

AFITOX MXP BC-F/MXP S-F 3,6/6 kV, AFITOX MXP BC-F/MXP S-F 6/10 kV, AFITOX MXP BC-F/MXP S-F 8,7/15 kV, AFITOX MXP BC-F/MXP S-F 12/20 kV

Construction:
 Conductors: Tined or plain, stranded copper class 2 or class 5 (-F)
 Conductor screen: Semiconducting compound
 Core insulation: HF XLPE
 Insulation screen: Semiconducting compound + tinned or plain copper tape
 Inner covering: Halogen free compound
 Metal covering: Galv. Steel wire braid (S) or tinned or plain copper wire braid (BC)
 Outer sheath: SHF1

AFITOX MXP BC/MXP S 3,6/6 kV

Number of cores x conductor cross-section mm ²	Overall diameter (Nominal) mm
1 x 25	21,0
1 x 35	22,0
1 x 50	23,5
1 x 70	25,0
1 x 95	27,0
1 x 120	29,0
1 x 150	30,5
1 x 185	32,0
1 x 240	35,0
1 x 300	39,0
1 x 400	42,0
1 x 500	47,0

Number of cores x conductor cross-section mm ²	Overall diameter (Nominal) mm
3 x 25	38,0
3 x 35	41,5
3 x 50	44,5
3 x 70	48,5
3 x 95	53,0
3 x 120	57,0
3 x 150	60,0
3 x 185	64,0
3 x 240	71,0

AFITOX MXP BC/MXP S 6/10 kV

Number of cores x conductor cross-section mm ²	Overall diameter (Nominal) mm
1 x 25	23,0
1 x 35	24,0
1 x 50	25,5
1 x 70	27,0
1 x 95	29,0
1 x 120	31,0
1 x 150	32,5
1 x 185	34,0
1 x 240	37,0
1 x 300	40,0
1 x 400	43,0

Number of cores x conductor cross-section mm ²	Overall diameter (Nominal) mm
1 x 500	47,0
3 x 25	43,0
3 x 35	46,0
3 x 50	49,0
3 x 70	53,0
3 x 95	58,0
3 x 120	61,0
3 x 150	64,0
3 x 185	69,0
3 x 240	75,0

AFITOX MXP BC/MXP S 8,7/15 kV

Number of cores x conductor cross-section mm ²	Overall diameter (Nominal) mm
1 x 25	25,5
1 x 35	26,5
1 x 50	28,0
1 x 70	30,0
1 x 95	32,0
1 x 120	33,5
1 x 150	35,0
1 x 185	37,0
1 x 240	40,0
1 x 300	43,0
1 x 400	45,5

Number of cores x conductor cross-section mm ²	Overall diameter (Nominal) mm
1 x 500	50,0
3 x 25	49,0
3 x 35	51,0
3 x 50	55,0
3 x 70	59,0
3 x 95	63,0
3 x 120	67,0
3 x 150	70,0
3 x 185	74,0
3 x 240	80,0

AFITOX MXP BC/MXP S 12/20 kV

Number of cores x conductor cross-section mm ²	Overall diameter (Nominal) mm
1 x 35	29,0
1 x 50	30,0
1 x 70	32,0
1 x 95	34,0
1 x 120	36,0
1 x 150	37,0
1 x 185	39,5
1 x 240	43,0
1 x 300	45,5
1 x 400	48,0

Number of cores x conductor cross-section mm ²	Overall diameter (Nominal) mm
1 x 500	52,0
3 x 35	57,0
3 x 50	60,0
3 x 70	64,0
3 x 95	68,0
3 x 120	72,0
3 x 150	75,0
3 x 185	79,0
3 x 240	86,0

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 sheet: AFITOX MXP dated 2005-07-27
 AFITOX MXP BC rev.2 dated 2006-02-03
 AFITOX MXP S rev.2 dated 2006-02-03
 Test reports: FICAP RE-0529 dated 2005-10-13

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	
<i>IEC 60092-354</i>	<i>2003-06</i>	<i>Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV)</i>	
IEC 60092-359	1999-08	Sheathing materials for shipboard power and telecommunication cables	
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

NEXANS FICAP - AFITOX MXP BC or AFITOX MXP S - Size - 3,6/6 kV or 6/10 kV or 8,7/15 kV or 12/20 kV – 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