

TYPE APPROVAL CERTIFICATE

This is to certify:**That the High Voltage Cable**

with type designation(s)

**XAI Flamebar, XAI & XAI-VFD(EMC) Flamebar, XAI & XAI-VFD(EMC) Flamebar,
XAI & XAI-VFD(EMC) Flamebar, XAI Flamebar**

Issued to

**Controlcavi Industria S.r.l.
Ferentino FR, Italy**

is found to comply with

**Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske
Veritas' Offshore Standards****Application :****Power.****Flame retardant Cat. A. Halogen free. Low smoke. Low temp. (-40°C).****Ozone and UV resistant.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed
by DNV GL.**

Type	Voltage (kV)	Temp. class (°C)
XAI Flamebar	3,6/6	90
XAI & XAI-VFD(EMC) Flamebar	6/10	90
XAI & XAI-VFD(EMC) Flamebar	8,7/15	90
XAI & XAI-VFD(EMC) Flamebar	12/20	90
XAI Flamebar	18/30	90

This Certificate is valid until .

Issued at **Høvik** on **2015-08-25**DNV GL local station: **Milan**Approval Engineer: **Ivar Bull**for **DNV GL**

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.

Job Id: **262.1-011080-2**
Certificate No: **TAE000008W**

Product description

XAI Flamebar 3,6/6
XAI & XAI-VFD(EMC) Flamebar 6/10
XAI & XAI-VFD(EMC) Flamebar 8,7/15 kV
XAI & XAI-VFD(EMC) Flamebar 12/20 kV
XAI Flamebar 18/30 kV

Construction:

Conductors:	Tinned copper flexible Class 2 or class 5 IEC 60228
Conductor screen:	Extruded semiconducting layer
Core insulation:	HEPR
Insulation screen:	Extruded semiconducting layer
Screen:	Tinned copper wire braid
Earth conductors for XAI-VFD(EMC)	Tinned copper HEPR insulated
Inner sheath:	SHF1
EMC for XAI-VFD(EMC)	Plain copper tape
Metal covering:	Tinned copper wire braid
Outer sheath:	SHF1

Type:	No of cores:	Cross sectional area [mm ²]
XAI Flamebar 3,6/6 kV	1	16 – 300
XAI Flamebar 3,6/6 kV	3	16 – 300
XAI Flamebar 6/10	1	16 – 300
XAI Flamebar 6/10	3	16 – 240
XAI & XAI-VFD(EMC) Flamebar 6/10	3	3x25/3x6 – 3x185/3x50
XAI Flamebar 8,7/15 kV	1	25 – 300
XAI Flamebar 8,7/15 kV	3	25 – 300
XAI & XAI-VFD(EMC) Flamebar 8,7/15 kV	3	3x25/3x6 – 3x150/3x25
XAI Flamebar 12/20 kV	1	35 – 300
XAI Flamebar 12/20 kV	3	35 – 300
XAI & XAI-VFD(EMC) Flamebar 12/20 kV	3	3x50/3x10 – 3x150/3x25
XAI Flamebar 18/30 kV	1	50 – 300
XAI Flamebar 18/30 kV	3	50 – 185

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

Type Approval documentation

Tests carried out

Standard	Issued	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 60092-360	2014-04	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 60092-354	2014-08	Electrical installations in ships - Part 354: 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)	
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	2013-07 2013-09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%
IEC 60092-350	2014-08	Annex E: Cold bend test and impact test for low temperature behaviour	Cold bend: -40°C
IMO resolution MSC 41(64), ATS 100.001	1994-12	Interim standard for measuring smoke and toxic products of combustion	Concentration of 10 toxic gases shall not exceed stated limits
UL 1581 Ed4	2001-10	Reference standard for Electrical wires, Cables and Flexible Cords	720h E@B>0,8

Marking of product

CCI - XAI Flamebar 3,6/6 kV – size – IEC 60332-3-22 – Year or
CCI -XAI & XAI-VFD(EMC) Flamebar 6/10kV – size – IEC 60332-3-22 – Year or
CCI -XAI & XAI-VFD(EMC) Flamebar 8,7/15 kV - IEC 60332-3-22 – Year or
CCI -XAI & XAI-VFD(EMC) Flamebar 12/20 kV - IEC 60332-3-22 – Year or
CCI -XAI Flamebar 18/30 kV IEC 60332-3-22 – Year

Periodical assessment

The scope of the Periodical assessment 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.



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The main elements of the Periodical assessment 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.

Periodical assessment to be performed at least every second year.

END OF CERTIFICATE