

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Electric Power Cable**with type designation(s)
SABIX BL 409 C FRNC

Issued to

SAB Bröckskes GmbH & Co. KG
Viersen, Germany

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Rated voltage (kV) 0,6/1****Temp. class (°C) 90**Issued at **Hamburg** on **2018-07-09**This Certificate is valid until **2023-07-08**.DNV GL local station: **Essen**for **DNV GL**Approval Engineer: **Carsten Hunsalz**

Arne Schaarmann
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.



Product description

Halogen free, flame retardant single cores

Rated voltage: 0,6 / 1 kV
 Maximum operating conductor temperature: 90° C
 Conductor: Bare or tinned copper, fine stranded class 5 or class 6
 Insulation: FRNC Thermoplastic insulation acc. EN 50290-2-26
 Screen: tinned copper braiding
 Outer sheath: SHF1 FRNC Thermoplastic sheathing compound

Number of cores: 1
 Cross-sectional area (mm²):
 0,75/1,0/1,5/2,5/4,0/6,0/10,0/16,0/25,0/35,0/50,0/70,0/
 95,0/120,0/150,0/185,0/240,0

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

Test reports: SAB 487/17+488/17 dated 23.08.2017 and 311/14 dated 30.06.2014
 SAB 121/11 dated 15.03.2011, SAB 041/11 dated 25.01.2011,
 VDE 493200-9021-0001/144041 dated 21.01.2011,
 VDE 493200-9021-0001/210127_1en dated 2015-08-26
 Currenta 09/1302, 09/1303, 09/1304, 09 /1298, 09/1299,
 09/1300, 09 /1310, 09/1311, 09/1312,

Data sheet: SABIX BL 409 C FRNC Version C dated 12.06.2018

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-353	2016-09	Electrical installations in ships – Part 353: Power cables for rated voltages 1 kV and 3 kV	partly
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.	partly
EN 50290-2-26	2007-6	Common design rules and construction – Halogen free flame retardant insulation compounds	
IEC 60332-1-2	2015-07	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable	Procedure for 1 kW pre-mixed flame
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

Job Id: **262.1-025224-1**
Certificate No: **TAE00002YE**

Standard	Release	General description	Limitation
IEC 60332-3-25	2009-02	Tests on electric and optical fibre cables under fire conditions – Part 3-25: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category D	Bunch test Category D
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 60684-2	2011-08	Flexible insulating sleeving –Part 2: Methods of test. Clause 45.2 Methods of determination of low levels of fluorine	HF max 0,1%
IEC 61034-1/2	2013-06	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance $\geq 60\%$

Marking of product

>0000m **DNV** • BRÖCKSKES • D-Viersen • SABIX BL 409 C FRNC 1 x A mm² - IEC 60332-3-22 - 0,6/1kV DNV GL CE xxx

A: cross section of cores
xxx = SAB ident number

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine Tests (RT) checked (if not available tests according to 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 is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE