

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

SIENOPYR FR MMGCGCH, MMGCEGCH, MMGCEGCH - FC

Issued to

**Prysmian Kabel und Systeme GmbH
Neustadt b. Coburg, Bayern, 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) 3,6/6 + 6/10 + 8,7/15 + 12/20****Temp. class (°C) 90**Issued at **Hamburg** on **2020-09-28**for **DNV GL**This Certificate is valid until **2025-09-27**.DNV GL local station: **Augsburg**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

High Voltage shipboard power cable with EPR insulation, copper wire braiding and thermoplastic outer sheath SHF1

Type: SIENOPYR FR MMGCGCH, MMGCEGCH, 6/10 kV + 8,7/15 kV + 12/20 kV
 SIENOPYR FR MMGCEGCH – FC 3,6/6 kV for puls- type static inverter

Conductor: Stranded copper wire
 Cond. screening: Non-metallic extruded semi-conducting layer
 Core insulation: EPR
 Insul. screening: Non-metallic extruded semi-conducting layer
 Copper wire or copper tape
 Inner covering: Extruded Polyolefine
 Metal covering: Copper wire braiding
 Outer sheath: SHF1

Number of cores: Cross-sectional area:

1	16 mm ² to 300 mm ² (6/10 kV)
3	16 mm ² to 240 mm ² (6/10 kV)
1	25 mm ² to 300 mm ² (8,7/15 kV)
3	25 mm ² to 240 mm ² (8,7/15 kV)
1	35 mm ² to 300 mm ² (12/20 kV)
3	35 mm ² to 240 mm ² (12/20 kV)
3	16 mm ² to 240 mm ² (SIENOPYR FR MMGCEGCH – FC 3,6/6 kV)

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.

High voltage power.
 Flame retardant in bunch Cat. A.

Type Approval documentation

Test report: AK 5456 dated 26.11.98 and 07.12./ 8.12.1998
 Type Test Certificate TP 3 /026/06, 2008/04/01
 Specification: Nr. 50 PS 118 Eddition 5.0 and No. KS 3/008/07 edition 02

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2020-01	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-354	2020-02	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)	

Job Id: **262.1-033116-1**
Certificate No: **TAE0000424**

Standard	Release	General description	Limitation
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 60332-1-2	2006-07	Tests on electric cables under fire conditions. Test for vertical flame propagation for a single insulated wire or cable.	
IEC 60332-3-22	2018-07	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	

Marking of product

Example:

Prysmian Kabel und Systeme GmbH - SIENOPYR FR MMGCGCH – size – 6/10 kV - IEC 60332-3-22 – Lot no.

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