

TYPE APPROVAL CERTIFICATE

This is to certify:

that the High Voltage Cable

with type designation(s)
SINOTHERM(180) S2GCT2G

issued to

Prysmian Kabel und Systeme GmbH
Neustadt b. Coburg, Bayern, Germany

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Especially for connections of frequency converter-controlled AC drives. For fixed installation with low mechanical stress, suitable at increased ambient temperatures and when increased chemical resistance is needed. Further details see under Application/Limitation on Page 2.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Rated voltage (kV) 6/10 (12) kV

Temp. class (°C) 150°C

Issued at **Høvik** on **2024-09-16**

This Certificate is valid until **2029-09-15**.

for **DNV**

DNV local unit: **Augsburg**

Approval Engineer: **Carsten Hunsalz**

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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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 USD 300 000.



Product description

Single- core, heat resistant, screened, halogen- free high voltage shipboard power cables.

Type:	SINOTHERM(180) S2GCT2G		
Rated voltage:	AC- systems (max. 60 Hz):	U ₀ /U (U _m) = 6/10 (12) kV	
	For use in VFD systems:	U ₀ /U (U _m) = 3,6/6 (7,2) kV	
Conductor:	Stranded, tinned copper wire class 5		
Cond. screening:	Non-metallic extruded semi-conducting layer		
Core insulation:	SIR		
Insul. screening:	Non-metallic extruded semi-conducting layer and tinned copper wire braid		
Protective Cover:	Textile braid, covered by EM107		
Number of cores:	Cross-sectional area:		
1	16 mm ² to 630 mm ²		

Application/Limitation

Especially for connections of frequency converter-controlled AC drives. For fixed installation with low mechanical stress, suitable at increased ambient temperatures and when increased chemical resistance is needed. Intended for fixed installation in protected areas with restricted accessibility on board of ships and offshore units or comparable areas. Special care shall be taken during installation to avoid damages.

Maximum permissible operating temperature at conductor (20 000 h):	180°C
Recommended operation temperature at conductor (> 100 000 h):	150°C
Maximum permissible short circuit temperature at conductor:	350°C (max. 5s)
Minimum permissible temperature:	-55°C

Installation and current-carrying capacity according manufacturers instruction.

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.

Flame retardant in bunch Cat. A.

Type Approval documentation

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 ($U_m = 7,2 \text{ kV}$) up to 30 kV ($U_m = 36 \text{ kV}$)	partly
IEC 60092-360	2021-01	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	partly
IEC 60332-1-2	2015-07	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	

Standard	Release	General description	Limitation
IEC 60754-2	2019-11	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 60754-3	2018-3	Test on gases evolved during combustion of materials from cables - Part 3: Measurement of low level of halogen content by ion chromatography	Chlorine, Fluorine, Bromine, Iodine < 1 mg/g
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance >60%

Marking of product

Example:

Prysmian Kabel und Systeme GmbH – SINOTHERM(180) S2GCT2G - 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