



Certificate no.:
TAE00004ZY

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Electric Power Cable**

with type designation(s)
Coroflex FHL2G series

issued to

Coroplast Fritz Müller GmbH und Co. KG
Wuppertal, Germany

is found to comply with

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

Application:

Special cables for wiring of the battery and or fuel cell energy systems on ships and boats.

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

Rated voltage (kV) 1 DC or 0,6 AC

Temp. class (°C) 95 acc. to DNV-RU-SHIP Pt.4 Ch.8 or acc. to manufacturer's instruction

Issued at **Hamburg** on **2024-12-04**

This Certificate is valid until **2029-12-03**.

for **DNV**

DNV local unit: **Essen**

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

Type Coroflex FHL2G series

Rated voltage: 1000V DC or 600V AC
 Maximum operating conductor temperature: 95 °C acc. to DNV-RU-SHIP Pt.4 Ch.8 or according to manufacturer's instruction
 Conductor: Stranded bare copper
 Outer sheath: Silicon rubber SiR

No. of cores: Nominal cross section mm²
 1 6, 10, 16, 25, 35, 50, 70, 95, 120

Application/Limitation

For wiring of the battery and or fuel cell energy systems on ships and boats.
 For example PHE (Plug in Hybrid Electric Ship/Boat), engine and battery wiring, PDU (Power Distribution Unit), OBC (Onboard Charger), AC/DC charging socket as well as corresponding auxiliary equipment like compressor, air conditioning, cooling systems and other electrical components.

Operating temperature: -40°C to +180°C 3000h

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.

Flame retardant Cat. A. Halogen free. Low smoke.

For installations outside of switchboards and other enclosures, Coroplast Tape 837X shall be used as further mechanical protection according to manufacturer's instruction.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
GS 95007-6-1	2021-05	Hochvolt-Einzel- und Hochvolt-Mantel-Leitungen ungeschirmt für Kraftfahrzeuge und deren elektrische Antriebe	
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	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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
IEC 60754-1	2019-11	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	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 60684-2	2011-08	Clause 45.2 Methods of determination of low levels of fluorine	Fluorine content < 0,1%
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:

COROFLEX [nnn] 9-2652 FHL2G 35 mm²/T180 ATTENTION HIGH VOLTAGE MAX 600 V AC / 1000 V DC [xx...xx]

[nnn]: code of production plant

[xx...xx]: internal code

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