

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Lightweight Electric Cable**with type designation(s)
EPD/PAAF series 0,6/1 kV

Issued to

Tyco Electronics UK Ltd
Swindon, United Kingdom

is found to comply with

DNV GL rules for classification – Ships, offshore units, and high speed and light craft**Application :****Special cable designed for elevated temperatures on combustion engines.**
Flame retardant in bunch Cat. A. Halogen free. Low smoke.**Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Rated voltage (kV) 0,6/1**
Temp. class (°C) 120Issued at **Høvik** on **2019-02-22**for **DNV GL**This Certificate is valid until **2023-12-31**.DNV GL local station: **London**Approval Engineer: **Ivar Bull****Marta Alonso Pontes**
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: **262.1-015897-23**
Certificate No: **TAE00003BV**

Product description

Type: EPD/PAAF series 0,6/1 kV

Conductors: Tinned, stranded copper
Core insulation: Halogen-Free Flame Retarded Thermoplastic compound
Inner covering: Polyester tape
Metal covering: Tinned copper wire braid
Outer sheath: SHF2

No of cores:	Cross sectional area [mm ²]
2, 3, 5, 7, 12, 25, 37	0,75
8, 12 Pairs	0,75
2, 3, 5, 12	1,5
2	2,5
2 Pairs	2,5 4 6

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.

Special cable designed for elevated temperatures on combustion engines.

Expected lifetime @120C according to IEC 60216-3-Ed1.0 (2002-02): 20,000 hrs. (2,2 years)

Expected lifetime @ 90C according to IEC 60216-3-Ed1.0 (2002-02): 300.000hrs (34 years)

Type Approval documentation

Data sheets: WT 2177 Issue 1 dated September 2009

TE drawings for customer specified cables based on CL105-SO & PIO 0,6/1 kV constructions:

EPD116222A, EPD116223A, EPD116224A, EPD116225A, EPD116226A, EPD116227A, EPD116228A, EPD117300A, EPD116230A, EPD116231A, EPD116232A, EPD116233A, EPD116234A, EPD116254A, EPD116253A, EPD116252A, EPD116246A

Test reports: WQ 1977 Issue 1 December 2008

WQ 1936 Issue 1 and 1a March 2005 and December 2008

WQ 2120 Issue 2 July 2009

Tests carried out

IEC 60216-3-1 (2002-02): Guide for the determination of thermal endurance properties of electrical insulating materials. Part 3: Instructions for calculating thermal endurance characteristics - Section 1: Calculations using mean values of normally distributed complete data

	Release	General description	Limitation
DNVGL-CP-0400	2015-12	Lightweight Electric cables	
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.	SHF2 outer sheath
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.	

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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 60216-3	2006-04	Electrical insulating materials - Thermal endurance properties – Part 3: Instructions for calculating thermal endurance characteristics	

Marking of product

Tyco Electronics – EPD/PAAF reference number - size – 0,6/1 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 shall 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