

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
TFOU (ic) & (c) 250 V, TFCU (ic) & (c) 250 V

Issued to

Suzhou Draka Cable Co. Ltd.
SUZHOU JIANGSU, China

is found to comply with
DNV GL rules for classification – Ships and offshore units

Application :

Control and instrumentation.

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

Type	Voltage class (V)	Temp. class (°C)
TFOU (ic) & (c) 250 V	250	90
TFCU (ic) & (c) 250 V	250	90

This Certificate is valid until **2021-06-30**.

Issued at **Høvik** on **2016-09-27**

DNV GL local station: **Shanghai**

for **DNV GL**

Approval Engineer: **Marta Alonso Pontes**

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Trond Sjøvåg
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

Type: TFOU (ic) & (c) 250 V & TFCU (ic) & (c) 250 V

Construction:

Conductors: Plain or tinned, stranded copper
Core insulation: XLPE
Screen: Copper or Aluminium backed polyester tape w/tinned copper drain wire
Inner covering: Halogen-free compound
Metal covering: Plain or tinned, Copper wire braid (O) or galv. Steel wire braid (C)
Outer sheath: SHF2

Number of pairs :	Conductor cross-section [mm ²]
1, 2, 3, 4, 6, 7, 8, 10, 12, 14, 16, 19, 24, 27, 30, 37	0.75, 1, 1.5
1, 2, 3, 4, 6, 7, 8, 10, 12, 14, 16, 19, 24	2.5

Number of triads :	Conductor cross-section [mm ²]
1, 3, 7, 12	0.75, 1, 1.5

Number of quads :	Conductor cross-section [mm ²]
1, 3, 7	0.75, 1, 1.5

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

Tests carried out

Standard	Release	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-376	2003-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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 60332-3-22	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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.
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	2005-04	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%



Job Id:
Certificate No: **TAE000019X**

Marking of product

Draka 83 - TFOU (ic) or (c) or TFCU (ic) or (c) - size - 250 V – 60332-3-22

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) and selected type tests (ref. to applicable class programs) checked (if not available these tests 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.

Assessment to be performed at least every second year.

END OF CERTIFICATE