

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Data transmission cables and systems

with type designation(s)

ToughCat 5e S/FTP Class 2 stranded conductor, ToughCat 7 S/FTP Class 2 stranded conductor, ToughCat 7S S/FTP Class 1 solid conductor

Issued to

Draka Comteq Germany GmbH & Co. KG
Köln, 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.

Issued at **Hamburg** on **2017-09-29**

This Certificate is valid until **2022-09-28**.

DNV GL local station: **Essen**

for **DNV GL**

Approval Engineer: **Carsten Hunsalz**

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Duy Nam Le
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: **262.1-010044-4**
Certificate No: **TAE000029J**

Product description

Type(s): **ToughCat 5e S/FTP 4x 2 x 0,22mm²**
Standards: Category 5/5e Installation/Horizontal cable according to:
EN 50173-1; EN 50288-2-1, ISO/IEC 11801; IEC 61156-5
Conductors: Plain, stranded copper
Core insulation: Polyethylene
Screen: Al/polyester tape
Metal covering: Tinned, Copper wire braid
Outer sheath: SHF1

Electric data at 20 °C

Frequency	Attenuation, nominal	NEXT
MHz	(db/100m)	(db)
1	2,1	90
4	4,0	90
10	6,3	90
16	8,0	90
20	9,0	90
31,25	11,4	90
62,5	16,5	86
100	21,3	83

Characteristic impedance 100 Ohm
DC-loop resistance ≤158 Ohm/km

Type(s): **ToughCat 7 S/FTP 4x2x 0,27mm² (stranded)**
ToughCat 7S S/FTP 4x2x 0,56mm (solid)
Standards: Category 7, Installation cable according to:
EN 50173-1; EN 50288-4-1, ISO/IEC 11801; IEC 61156-5
Conductors: Plain solid copper or plain stranded copper
Core insulation: Polyethylene
Screen: Al/polyester tape
Metal covering: Tinned, Copper wire braid
Outer sheath: SHF1

Electric data at 20 °C

Frequency	Class 1 solid conductor		Class 2 stranded conductor	
	Attenuation, nominal	NEXT	Attenuation, Nominal	NEXT
MHz	(db/100m)	(db)	(db/100m)	(db)
1	1,8	100	2,0	90
4	3,4	100	3,6	90
10	5,4	100	5,5	90
16	6,8	100	7,5	90
20	7,7	100	7,7	90
31,25	9,6	100	9,8	90
62,5	13,7	100	14,0	86
100	17,4	100	17,9	83
155	21,9	94	22,4	81
200	25,0	92	25,6	78
250	28,1	90	28,7	77
300	30,9	89	31,6	73
600	44,8	85	45,7	71

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	Class 1 solid conductor	Class 2 stranded conductor
Characteristic impedance	100 Ohm	100 Ohm
DC-loop resistance	$\leq 150 \Omega/\text{km}$	$\leq 138 \Omega/\text{km}$

Application/Limitation

Data communication cable
Installation / Horizontal cable
Halogen free, Low smoke

Temperature window

Operation: - 40°C to +85°C
Installation: - 15°C to +50°C

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.

In order to achieve a transmission link compliant with Category 7, cables shall be installed with suitable termination equipment according to manufacturer's recommendations.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
	2015-12	DNV GL Type Approval Programme DNVGL-CP-0403	
IEC 61156-5	2009-05	Multicore and symmetrical pair/quad cables for digital communications - Part 5: Symmetrical pair/quad cables with transmission characteristics up to 1 000 MHz - Horizontal floor wiring - Sectional specification	Reference to requirement for category cable: Cat 5e (100MHz), Cat 7 (600MHz)
ISO/IEC 11801	2010-04	Information technology – Generic cabling for customer premises, inc Amd 1 and 2.	Reference to requirement for category cable: Cat 5e (100MHz), Cat 7 (600MHz)
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 60332-3-24	2009-11	Tests on electric and optical fibre cables under fire conditions – Part 3-24: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category C	Bunch test Category C
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

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Standard	Release	General description	Limitation
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%

Marking of product

DRAKA ToughCat Part No. 60011599 CERTIFIED BY DNV GL TYPE APPROVAL PROGRAMME NO. DNVGL-CP-0403 CATEGORY 5e S/FTP 4x2/0,22mm² - IEC 61156-5 - EN 50288-2-1 - IEC 60332-3-24 - LSHF-FR - Batch no.- Metermarking or

DRAKA ToughCat Part No. 60011617 CERTIFIED BY DNV GL TYPE APPROVAL PROGRAMME NO. DNVGL-CP-0403 CATEGORY 7 S/FTP 4x2/0,27mm² - IEC 61156-5 - EN 50288-4-1 - IEC 60332-3-24 - LSHF-FR - Batch no. - Metermarking or

DRAKA ToughCat Part No. 60015280 CERTIFIED BY DNV GL TYPE APPROVAL PROGRAMME NO. DNVGL-CP-0403 CATEGORY 7S S/FTP 4x2/0,56mm - IEC 61156-5 - EN 50288-4-1 - IEC 60332-3-24 - LSHF-FR - Batch no. - Metermarking

Place of Production

Draka Comteq Germany GmbH & Co. KG, Wohlaue Str. 15, D-90457 Nürnberg

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