

TYPE APPROVAL CERTIFICATE

Certificate No:
TAE000029J
Revision No:
2

This is to certify:

That the **Data transmission cables and systems**

with type designation(s)

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

Issued to

Draka Comteq Germany GmbH & Co. KG
Köln, Germany

is found to comply with

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

Application :

Products approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2023-01-24**

for **DNV**

This Certificate is valid until **2027-09-21**.

DNV local station: **Essen**

Approval Engineer: **Ivar Bull**

Frederik Tore Elter
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.

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 300,000 USD.



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 or SHF1 with additional thermoplastic halogen free polyurethane (TPU)

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

Types:	ToughCat 7 S/FTP 4x2x 0,27mm² (stranded) ToughCat 7S S/FTP 4x2x 0,56 mm (solid) ToughCat 7AS S/FTP 4x2x 0,58 mm (solid)
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Standards	Category 7 / 7A, 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 or SHF1 with additional thermoplastic halogen free polyurethane (TPU)

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
1000 (7A)	58,5	82	---	---

	Class 1 solid conductor	Class 2 stranded conductor
Characteristic impedance	100 Ohm	100 Ohm
DC-loop resistance	≤ 150 Ω/km	≤138 Ohm/km

Application/Limitation

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

Temperature window

Operation: - 40°C to +80°C

Installation: - 20°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

- Data sheets:**
- IE_ToughCat5_S_FTP_e, dated 19.08.2022
 - IE_ToughCat5_S_FTP_MUD_e, dated 19.08.2022
 - IE_ToughCat7_S_FTP_e, dated 19.08.2022
 - IE_ToughCat7_S_FTP_MUD_e, dated 19.08.2022
 - IE_ToughCat7S_S_FTP_e, dated 19.08.2022
 - IE_ToughCat7S_S_FTP_MUD_e, dated 19.08.2022
 - IE_ToughCat7AS_S_FTP_e, dated 19.08.2022
 - IE_ToughCat7AS_S_FTP_MUD_e dated 10.08.2022
- Test reports:**
- Draka test report summary dated 2004-01-30
 - DRAKA S_FTP AWG23 Cat7a 100m 01.03.2022
 - Draka MUD Test report Lab18-010 dated 03.05.2018.

Tests carried out

Standard	Release	General description	Limitation
DNV-CP-0403	2021-09	DNV Type Approval Programme Data communication cables - category cables	
IEC 61156-5	2020-04	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) Cat 7a (1000MHz)
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) Cat 7a (1000MHz)
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	2018-07	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	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

Standard	Release	General description	Limitation
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%
NEK 606 Ed.5	2016	Cables for offshore installations halogen-free, low smoke, flame retardant/fire resistant. Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. EDC 95/11 70°C 56d

Marking of product

DRAKA ToughCat Part No. 60011599 CERTIFIED BY DNV TYPE APPROVAL PROGRAMME NO. DNV-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. 60015701 CERTIFIED BY DNV TYPE APPROVAL PROGRAMME NO. DNV-CP-0403 CATEGORY 5e S/FTP 4x2/0,22mm² - IEC 61156-5 - EN 50288-4-1 - MUD PROTECTED Batch no. - Metermarking

DRAKA ToughCat Part No. 60011617 CERTIFIED BY DNV TYPE APPROVAL PROGRAMME NO. DNV-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. 60015692 CERTIFIED BY DNV TYPE APPROVAL PROGRAMME NO. DNV-CP-0403 CATEGORY 7 S/FTP 4x2/0,27mm² - IEC 61156-5 - EN 50288-4-1 - MUD PROTECTED Batch no. - Metermarking

DRAKA ToughCat Part No. 60015280 CERTIFIED BY DNV TYPE APPROVAL PROGRAMME NO. DNV-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

DRAKA ToughCat Part No. 60015706 CERTIFIED BY DNV TYPE APPROVAL PROGRAMME NO. DNV-CP-0403 CATEGORY 7S S/FTP 4x2/0,56mm - IEC 61156-5 - EN 50288-4-1 - MUD PROTECTED Batch no. - Metermarking

DRAKA ToughCat Part No. 60102011 CERTIFIED BY DNV TYPE APPROVAL PROGRAMME NO. DNV-CP-0403 CATEGORY 7AS S/FTP 4x2/0,58mm - IEC 61156-5 - EN 50288-4-1 - IEC 60332-3-24 - LSHF-FR - Batch no. - Metermarking

DRAKA ToughCat Part No. 60101963 CERTIFIED BY DNV TYPE APPROVAL PROGRAMME NO. DNV-CP-0403 CATEGORY 7AS S/FTP 4x2/0,58 mm - IEC 61156-5 - EN 50288-4-1 - MUD PROTECTED Batch no. - Metermarking

Place of Production

Draka Comteq Germany GmbH & Co. KG, Wohlauer 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