



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

**CERTIFICATE NO. E-9545**  
This Certificate consists of 4 pages

*This is to certify that the*  
**Data transmission cables and systems**  
*with type designation(s)*  
**ToughCat 5e S/FTP; ToughCat 7 S/FTP**

*Manufactured by*  
**Draka Comteq Norway AS**  
DRAMMEN, Norway

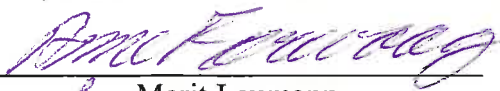
*is found to comply with*  
Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards  
Type Approval Programme No. 6-827.50-2  
IEC 60332-3-24 (2000-10)  
IEC 60754-1 (1994-01)  
IEC 60754-2 (1997-04)  
IEC 61034-2 (2005-04)

*Application*  
Data communication cable. Installation / Horizontal cable. Halogen free. Low smoke.



*Place and date*  
Høvik, 2009-05-28  
for DET NORSKE VERITAS AS



*This Certificate is valid until*  
2011-06-30

  
for Marit Laumann  
Head of Section

Local Office  
DNV Oslo

  
Ivar Bull  
Surveyor 

**Notice: 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.**

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



Cert. No.: E-9545  
 File No.: 827.50  
 Job Id.: 262.1-007578-1

## Product description

Type(s):	<b>ToughCat 5e S/FTP</b>
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

Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter mm
4 x 2 x 0,22	7,7±0,3

Frequency MHz	Attenuation, nom (db/100m)	NEXT (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

Frequency MHz	Attenuation, nom (db/100m)	NEXT (db)
100	21,3	83
155	24,2	81
200	31,5	78
250	35,8	77
300	47,1	73
600	60,1	71

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



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Type(s):	<b>ToughCat 7 S/FTP</b>
Standards	Category 7, Installation cable according to: EN 50173-1; EN 50288-4-1 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

Number of cores x conductor cross-section mm <sup>2</sup>	Overall diameter mm
4 x 2 x 0,27	8,1±0,3

Electric data at 20 °C

Frequency MHz	Attenuation, nom (db/100m)	NEXT (db)
1	2,0	90
4	3,6	90
10	5,5	90
16	7,5	90
20	7,7	90
31,25	9,8	90
62,5	14,0	86

Frequency MHz	Attenuation, nom (db/100m)	NEXT (db)
100	17,9	83
155	22,4	81
200	25,6	78
250	28,7	77
300	31,6	73
600	45,7	71

Characteristic impedance 100 Ohm  
 DC-loop resistance 138 Ohm/km

**Application/Limitation**

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.



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### **Type Approval documentation**

Data sheet(s): NO Cat 5 ToughCat S\_FTP, dated 14.04.2009  
NO Cat 7 ToughCat S\_FTP, dated 14.04.2009  
Test report: Draka test report summary dated 2004-01-30

### **Tests carried out**

Tested according to IEC 60332-3-24, IEC 60754-1/2, IEC 61034-1/2 and Type Approval Programme 6-827.50-2

### **Marking of product**

DRAKA TOUGH CAT S/FTP 4x2/0.22mm<sup>2</sup> CAT. 5e PART.NO. 1000745  
DRAKA TOUGH CAT S/FTP 4x2/0.27mm<sup>2</sup> CAT. 7 PART.NO. 1016274

### **Certificate retention survey**

The scope of the retention/renewal survey is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and 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.

Survey to be performed at least every second year.

END OF CERTIFICATE