

# ICS IE ToughCat 5e

## S/FTP Installation Cable for tougher environments



### Application

Generic Data transmission. This cable is a **Cat5e S/FTP** cable meant for use as installation (horizontal) cable in tougher electrical and mechanical environment, including ships and offshore units.

### Standards

EN 50173-1; EN 50288-2-1  
ISO/IEC 11801; IEC 61156-5  
Power over Ethernet (PoE/PoE+)  
Det Norske Veritas (DNV GL) Class Program DNVGL-CP-0403 and Lloyd Register approval system, 2002

### Fire rating

EN 50399. Class D<sub>ca</sub> s2d1a1  
LSHF-FR (SHF1): IEC 60332-3-24; IEC 60332-1; IEC 60332-3-24; IEC 60754-2; IEC 61034

### Chemical resistance

Mineral oils IRM 902 (IEC60811-2-1) : 7 days/23°C, 4 hours/70°C  
Diesel - IRM 903 (IEC60811-2-1) : 7 days/23°C, 4 hours/70°C

### Certification

This cable is certified by: Det Norske Veritas (DNV GL) and Lloyd Register.

### Construction

Conductor	Stranded copper wire Ø 0.22 mm <sup>2</sup> , AWG24
Insulation	PE, Ø 1.4 mm
Twisting	2 cores to the pair
Cable lay up	4 pairs
Pair screen	Al-laminated plastic foil around each pair
Overall screen	Copper braid, tinned Ø 6,2 mm
Sheath	Oil resistant, Fire retardant and halogen free LSHF-FR, SHF1, acc. to IEC60092-360

### Mechanical Properties

Bending radius	Installation	8 x D
	Installed	4 x D
Temperature range	During operation	-40°C to + 85°C

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	During installation	-15°C to + 50°C
Fire load	4 pair	515 MJ/km
Maximum tensile load	During operation	No load
	During installation	130 N

### Electrical Properties

at 20°C

DC loop resistance		≤ 158 Ω/km
Resistance unbalance		≤ 2%
Insulation resistance	(500 V)	≥ 5000 MΩxkm
Capacitance	at 800 Hz	Nom. 43 nF/km
Capacitance unbalance	(pair to ground)	≤ 1500 pF/km
Mean Characteristic impedance	@ 100 MHz)	100 ± 5 Ω
Nominal velocity of propagation		0,75c
Propagation delay		≤ 450 ns/100 m
Delay skew		≤ 15 ns/100 m
Transfer impedance	at 1 MHz	≤ 10 mΩ /m
	at 10 MHz	≤ 8 mΩ /m
	at 30 MHz	≤ 10 mΩ /m
Coupling attenuation		≥ 85 dB
Segregation classification	Acc. to EN 50174-2	"D"

### Nominal Transmission characteristics

at 20°C

F (MHz)	Attenuation (dB/100m)	NEXT (dB)	ACR (dB/100m)	Return loss (dB)	PS-NEXT (dB)	PS-ACR (dB/100m)	ELFEXT (dB/100m)	PS-ELFEXT (dB/100m)
1	2,1	90	88		87	85	85	82
4	4,0	90	86	27	87	83	85	82
10	6,3	90	84	30	87	81	79	76
16	8,0	90	82	30	87	79	75	72
20	9,0	90	81	30	87	78	73	70
31.25	11,4	90	79	30	87	76	69	66
62.50	16,5	86	70	30	83	67	63	60
100	21,3	83	62	30	80	59	59	56
155.00	24,2	81	57	26	78	54	57	54
200.00	31,5	78	47	25	75	44	53	50
250.00	35,8	77	41	25	74	38	51	48
300.00	47,1	73	26	23	70	23	47	44
600.00	60,1	71	11	20	68	8	44	41

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### Technical data

Part no.	Description	Colour	Outer diameter mm	Euro Class	Fire load		Weight kg/km
					MJ/km	kWh/m	
60011599	ToughCat5 S/FTP 4x2/0,22mm <sup>2</sup>	Grey RAL7035	7,6	D <sub>ca</sub> s2d1a1	515	0,143	65

### Product Code Table

Product Description	PG Reference Code	PG Part Number
ToughCat C5e LSHF-FR 4x2/0.22mm <sup>2</sup>	60011599	<b>60011599</b>
ToughCat C5e LSHF-FR 4x2/0.22mm <sup>2</sup> 500DP	60011599	<b>60015830</b>
ToughCat C5e LSHF-FR 4x2/0.22mm <sup>2</sup> 1000DP	60011599	<b>60015833</b>

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