

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Category cables**

with type designation(s)

**InduData Cat 5e S/FTP 4 x 2 x 0,22mm<sup>2</sup> AWG 24/7 stranded,**  
**InduData Cat. 6A S/FTP 4 x 2 x 0,246mm<sup>2</sup> (7 x 0,212mm) stranded 66J212-008,**  
**InduData Cat. 6A S/FTP 4 x 2 x 0,246mm<sup>2</sup> (1x0,56mm) solid 66J56-008,**  
**InduData Cat 7 S/FTP 4 x 2 x 0,27mm<sup>2</sup> AWG 22/7 stranded,**  
**InduData Cat 7 S/FTP 4 x 2 x 0,259mm<sup>2</sup> AWG 23/1 solid,**  
**InduData Cat. 7A S/FTP 4 x 2 x 0,264mm<sup>2</sup> (1x0,58mm) solid 72J58-008**

Issued to

**B.V. Twentsche Kabelfabriek**  
**Haaksbergen, Netherlands**

is found to comply with

**DNV GL rules for classification – Ships, offshore units, and high speed and light craft****Application :****Data communication cable, installation/horizontal cable****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2019-12-23**for **DNV GL**This Certificate is valid until **2022-12-31**.DNV GL local station: **Jiangyin**Approval Engineer: **Ivar Bull**

**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.



Job Id: **262.1-015223-3**  
 Certificate No: **TAE00002J5**  
 Revision No: **1**

## Product description

Construction:

Construction	
Conductor	Stranded or solid plain or tinned copper
Insulation	Foam PE
Twisting/ screens	Individual laminated aluminium tape + overall tinned copper braid
Outer sheath	SHF1

## Transmission properties:

*Cat. 5e S/FTP 4 pair cable*

Transmission Frequency(MHz)	1	4	8	10	16	20	25	31,25	62,5	100
Attenuation dB/100m	2,1	4,1	5,8	6,5	8,3	9,3	10,4	11,7	17,0	22,0
Return Loss dB/100m	20,0	23,0	24,5	25,0	25,0	25,0	24,3	23,6	21,5	20,1
PSNEXT dB/100m	62,3	53,3	48,8	47,3	44,2	42,8	41,3	39,9	35,4	32,3

*Cat. 6A S/FTP 4 pair cable – 66J212-008 and Cat. 6A S/FTP 4 pair cable – 66J56-008:*

Transmission Frequency(MHz)	1	4	10	16	20	31,25	62,5	100	200	250	400	500
Attenuation dB/100m	2,1	3,8	5,9	7,5	8,4	10,5	15,0	19,1	27,6	31,1	40,1	45,3
Return Loss dB/100m	20	23	25	25	25	23,6	21,5	20,1	18,0	17,3	17,3	17,3
PSNEXT dB/100m	72,3	63,3	57,3	54,2	52,8	49,9	45,4	42,3	37,8	36,3	33,3	31,8

*Cat. 7 S/FTP 4 pair cable – 70J212-008 and Cat. 7 S/FTP 4 pair cable – 70J56-008::*

Transmission Frequency (MHz)	1	4	10	16	20	30	31,25	62,5
Attenuation dB/100m	2,0	3,7	5,9	7,4	8,3	10,2	10,4	14,9
Return Loss dB/100m	20	23	25	25	25	23,8	23,6	21,5
PSNEXT dB/100m	75	75	75	75	75	75	75	72,5

Transmission Frequency (MHz)	100	155	200	250	300	600
Attenuation dB/100m	19,0	24,0	27,47	31,0	34,2	50,1
Return Loss dB/100m	20,1	18,8	18,0	17,3	17,3	17,3
PSNEXT dB/100m	69,4	66,5	64,9	63,4	62,2	57,7

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Cat. 7A S/FTP 4 pair cable – 72J58-008:

Transmission Frequency (MHz)	1	4	10	16	20	25	31,25	62,5
Attenuation dB/100m	2,1	3,7	5,8	7,3	8,2	9,2	10,3	14,6
Return Loss dB/100m	20	23	25	25	25	24,3	23,6	21,5
PSNEXT dB/100m	75	75	75	75	75	75	75	75

Transmission Frequency (MHz)	100	200	250	300	500	600	800	1000
Attenuation dB/100m	18,5	26,5	29,7	32,7	42,8	47,1	54,9	61,9
Return Loss dB/100m	20,1	18,0	17,3	17,3	17,3	17,3	16,1	15,1
PSNEXT dB/100m	72,4	67,9	66,4	65,2	61,9	60,7	58,9	57,4

### Manufactured by

Zhangjiagang Twentsche Cable Co., Ltd.,  
 Jiangsu, China

### 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.

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

Datasheets:

- 56J20-008, ver. 2012-ZTC-12-06
- 70J223-008, ver. 2012-ZTC-12-06
- 70J56-008, ver. 2012-ZTC-12-06

- TKF data sheet 24031 Cat.6A S/FTP Marine Approved 4 x 2 x AWG 23/1 dated 5/23/2019
- TKF data sheet 24032 Cat.6A S/FTP Marine Approved 4 x 2 x AWG 23/7 dated 5/23/2019
- TKF data sheet 24023 Cat.7A S/FTP Marine Approved 4 x 2 x AWG 23/1 dated 5/23/2019

Test reports :

- China National Center for Quality Supervision and Test of Electric Wire and Cable; report CT12-5505-1
- China National Center for Quality Supervision and Test of Electric Wire and Cable; report CT12-5505-2
- China National Center for Quality Supervision and Test of Electric Wire and Cable; report CT12-5505-3

### Tests carried out

Standard	Release	General description	Limitation
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: 5e (100MHz), 7 (600MHz),

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Standard	Release	General description	Limitation
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 60332-3-24	2009-02	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 60332-1-2	2004-07	Tests on electric and optical fibre cables under fire conditions – Part 1-1: Test for vertical flame propagation for a single insulated wire or cable – Apparatus	Flame retardant small scale
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	IEC 61034-1/2

### Marking of product

TKF - InduData - Category 5E S/FTP - 4 x 2 x 0,22mm<sup>2</sup> (AWG 24/7) stranded – HFFR-LS- MARINE APPROVED <BATCH NR.><Meter MARKING> or

TKF - InduData - Category 6A S/FTP - 4x2x0,246 mm<sup>2</sup> (AWG 23/7) stranded – HFFR-LS- MARINE APPROVED <BATCH NR.><Meter MARKING> or

TKF - InduData - Category 6A S/FTP - 4x2x0,246 mm<sup>2</sup> (AWG 23/1) solid – HFFR-LS- MARINE APPROVED <BATCH NR.><Meter MARKING> or

TKF - InduData - Category 7 S/FTP - 4 x 2 x 0,27mm<sup>2</sup> (AWG 22/7) stranded - HFFR-LS - MARINE APPROVED <BATCH NR.> <Meter MARKING> or

TKF - InduData - Category 7 S/FTP - 4 x 2 x 0,259mm<sup>2</sup> (AWG 23/1) solid - HFFR-LS - MARINE APPROVED <BATCH NR.> <Meter MARKING> or


TKF - InduData - Category 6A S/FTP - 4x2x0,58 mm<sup>2</sup> (AWG 23/1) solid – HFFR-LS- MARINE APPROVED <BATCH NR.><Meter MARKING>

### 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.



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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