DNV·GL

Certificate No:
TAE000022E

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
S3 BFOU(i), S37S7 BFOU(i), S4 BFOU(c), S4/S7 BFOU(c)

Issued to
Jiangsu Jiangyang Special Cable Co., Ltd.
Yangzhou, China

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.
Rated voltage (kV) 150/250
Temp. class (°C) 90

Issued at **Hamburg** on **2017-08-01**
This Certificate is valid until **2022-07-31**.
DNV GL local station: **Nanjing**

Approval Engineer: **Holger Jansen**

for **DNV GL**

Joannis Papanuskas
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.

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Product description

Type: S3 BFOU(i), S3/S7 BFOU(i) 150/250 V
S4 BFOU(c), S4/S8 BFOU(c) 150/250 V

Conductors :	Tinned annealed, stranded copper Class 2 or Class 5
Insulation:	EPR
Screen:	Copper/polyester or Aluminium/polyester tape with drain wire
Inner covering:	Extruded
Armor:	Tinned copper wire braid
Outer sheath :	SHF2 or SHF Mud

Number of cores x conductor cross-section	Number of cores x conductor cross-section	Number of cores x conductor cross-section	Number of cores x conductor cross-section
mm²	mm²	mm²	mm²
1×2×0.75	1×2×1.5	1×3×0.75	1×3×1.5
2×2×0.75	2×2×1.5	2×3×0.75	2×3×1.5
3×2×0.75	3×2×1.5	3×3×0.75	3×3×1.5
4×2×0.75	4×2×1.5	4×3×0.75	4×3×1.5
5×2×0.75	5×2×1.5	5×3×0.75	5×3×1.5
7×2×0.75	7×2×1.5	7×3×0.75	7×3×1.5
8×2×0.75	8×2×1.5	8×3×0.75	8×3×1.5
10×2×0.75	10×2×1.5	10x3×0.75	10×3×1.5
12×2×0.75	12×2×1.5	12×3×0.75	12×3×1.5
14×2×0.75	14×2×1.5	14×3×0.75	14×3×1.5
16×2×0.75	16×2×1.5	16×3×0.75	16×3×1.5
19×2×0.75	19×2×1.5	19×3×0.75	19×3×1.5
24×2×0.75	24×2×1.5	24×3×0.75	24×3×1.5
27×2×0.75	27×2×1.5	27×3×0.75	27×3×1.5
30×2×0.75	30×2×1.5	30×3×0.75	30×3×1.5
33×2×0.75	33×2×1.5	33×3×0.75	33×3×1.5
37×2×0.75	37×2×1.5	37×3×0.75	37×3×1.5
1×2×1.0	1×2×2.5	1×3×1.0	1×3×2.5
2×2×1.0	2×2×2.5	2×3×1.0	2×3×2.5
3×2×1.0	3×2×2.5	3×3×1.0	3×3×2.5
4×2×1.0	4×2×2.5	4×3×1.0	4×3×2.5
5×2×1.0	5×2×2.5	5×3×1.0	5×3×2.5
7×2×1.0	7×2×2.5	7×3×1.0	7×3×2.5
8×2×1.0	8×2×2.5	8×3×1.0	8×3×2.5
10×2×1.0	10×2×2.5	10×3×1.0	10×3×2.5
12×2×1.0	12×2×2.5	12×3×1.0	12×3×2.5
14×2×1.0	14×2×2.5	14×3×1.0	14×3×2.5
16×2×1.0	16×2×2.5	16×3×1.0	16×3×2.5
19×2×1.0	19×2×2.5	19×3×1.0	19×3×2.5
24×2×1.0	24×2×2.5	24×3×1.0	24×3×2.5
27×2×1.0	27×2×2.5	27×3×1.0	27×3×2.5
30×2×1.0	30×2×2.5	30×3×1.0	30×3×2.5
33×2×1.0	33×2×2.5	33×3×1.0	33×3×2.5
37×2×1.0	37×2×2.5	37×3×1.0	37×3×2.5

Application/Limitation

This type of cable is fire resistant according to IEC 60331-21.

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.

Control and instumentation. Flame retardant Cat A. Halogen free. Low smoke.

Type Approval documentation

Tests carried out

Standard	Issued	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-376	2017-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
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 60331-21	1999-04	Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to and including 0,6/1,0 kV	Minimum 90 min. flame application + 15 min. cooling period.
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	
IEC 60332-3-22	2009-02	Tests on electric and optical fibre cables under fire conditions – Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables – Category A	Bunch test Category A
IEC 60754-1	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the amount of halogen acid gas	Low Halogen: <0,5% Halogen
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables – Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and condctivity	Halogen free: pH > 4,3 Conductivity < 10µS
IEC 61034-1/2	2016-06	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke
NEK TS 606	2009-05	Cables for offshore installations. Halogen-free and/or mud resistant. Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. Carbo Sea 70°C 56d or EDC 95/11 70°C 56d

Marking of product

Jiangsu Jiangyang Special Cable Co., Ltd. S3 BFOU(i) or S3/S7 BFOU(i) or S4 BFOU(c) or S4/S8 BFOU(c) 150/250 V - date – IEC 60331-21 - IEC 60332-3-22

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