DNV·GL

Certificate No:
TAE0000268

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
CEF/DA&SA, CEH/DA&SA, CEV/DA&SA, CEFR/DA&SA, CEHR/DA&SA, CEVR/DA&SA

Issued to
Hebei Huatong Wires & Cables Group Co., Ltd.
Tangshan, 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) 0,6/1
Temp. class (°C) 90

Issued at **Hamburg** on **2017-08-10**
This Certificate is valid until **2022-08-09**.
DNV GL local station: **Tianjin**

Approval Engineer: **Carsten Hunsalz**

for **DNV GL**

Duy Nam Le
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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Job Id: **262.1-008108-10**
Certificate No: **TAE0000268**

Product description

Type: CEF/DA, CEF/SA, CEH/DA, CEH/SA, CEV/DA, CEV/SA CEFR/DA, CEFR/SA, CEHR/DA, CEHR/SA, CEVR/DA and CEVR/SA 0,6/1 kV

Construction:

Conductors: Tinned stranded copper
Core insulation: EPR
Outer sheath: SE1 (CEF) SH (CEH) ST2 (CEV)

CEF/DA&SA CEH/DA&SA CEV/DA&SA

Number of cores x conductor cross-section	Overall Dia-meter min.	Overall Dia-meter max.
mm^2	mm	mm
CEF/DA&SA CEH/DA&SA CEV/DA&SA		
1 x 1,0	5,0	7,6
1 x 1,5	5,2	7,8
1 x 2,5	5,6	8,4
1 x 4	6,0	8,8
1 x 6	6,6	9,6
1 x 10	7,4	10,5
1 x 16	8,6	12,0
1 x 25	10,0	14,0
1 x 35	11,0	15,5
1 x 50	13,0	17,5
1 x 70	14,5	19,0
1 x 95	16,5	22,0
1 x 120	18,0	23,5
1 x 150	20,0	25,5
1 x 185	22,5	28,5
1 x 240	25,5	31,5
1 x 300	28,0	34,5
2 x 1,0	8,4	12,5
2 x 1,5	9,0	13,0
2 x 2,5	10,0	14,5
2 x 4	11,0	15,5
2 x 6	12,0	16,5
2 x 10	13,5	19,0
2 x 16	16,0	21,5
2 x 25	19,0	25,0
2 x 35	21,5	28,0
2 x 50	24,5	31,5
2 x 70	28,0	35,5
2 x 95	32,5	41,0
2 x 120	35,5	44,5

Number of cores x conductor cross-section	Overall Dia-meter min.	Overall Dia-meter max.
mm^2	mm	mm
CEF/DA&SA CEH/DA&SA CEV/DA&SA		
3 x 1,0	9,0	13,0
3 x 1,5	9,6	14,0
3 x 2,5	10,5	15,0
3 x 4	11,5	16,0
3 x 6	13,0	18,0
3 x 10	14,5	20,0
3 x 16	17,0	22,5
3 x 25	20,5	27,0
3 x 35	23,0	29,5
3 x 50	26,5	34,0
3 x 70	30,0	38,5
3 x 95	35,0	44,0
3 x 120	38,5	47,5
3 x 150	42,5	52,5
3 x 185	47,0	58,0
4 x 1,0	10,0	14,0
5 x 1,0	10,5	15,5
7 x 1,0	11,5	16,5
10 x 1,0	15,0	21,0
12 x 1,0	15,5	21,5
14 x 1,0	16,5	22,5
16 x 1,0	17,5	24,0
19 x 1,0	18,0	25,0
24 x 1,0	21,5	29,5
27 x 1,0	22,0	30,0
30 x 1,0	23,0	31,0
33 x 1,0	24,0	32,5
37 x 1,0	25,0	34,0

Number of cores x conductor cross-section	Overall Dia-meter min.	Overall Dia-meter max.
mm^2	mm	mm

Number of cores x conductor cross-section	Overall Dia-meter min.	Overall Dia-meter max.
mm^2	mm	mm

CEF/DA&SA CEH/DA&SA CEV/DA&SA		
4 x 1,5	10,5	15,0
5 x 1,5	11,5	16,0
7 x 1,5	12,5	17,5
10 x 1,5	16,0	22,0
12 x 1,5	17,0	23,0
14 x 1,5	17,5	24,0
16 x 1,5	18,5	25,5
19 x 1,5	20,0	27,0
24 x 1,5	23,5	31,5
27 x 1,5	24,0	32,5
30 x 1,5	25,0	33,5
33 x 1,5	26,0	35,0
37 x 1,5	27,0	36,0

CEF/DA&SA CEH/DA&SA CEV/DA&SA		
4 x 2,5	11,5	16,0
5 x 2,5	12,5	17,5
7 x 2,5	14,0	19,0
10 x 2,5	18,0	24,5
12 x 2,5	18,5	25,0
14 x 2,5	19,5	26,5
16 x 2,5	20,5	28,0
19 x 2,5	22,0	29,5
24 x 2,5	26,0	34,5
27 x 2,5	27,0	35,5
30 x 2,5	27,5	36,5
33 x 2,5	29,0	38,5
37 x 2,5	30,0	39,5

CEFR/DA&SA CEHR/DA&SA CEVR/DA&SA

Number of cores x conductor cross-section	Overall Dia-meter min.	Overall Dia-meter max.
mm^2	mm	mm
CEFR/DA&SA CEHR/DA&SA CEVR/DA&SA		
1 x 1,0	5,0	7,0
1 x 1,5	5,2	7,4
1 x 2,5	5,6	7,8
1 x 4	6,0	8,4
1 x 6	6,6	10,0
1 x 10	7,6	11,0
1 x 16	8,8	13,0
1 x 25	10,0	15,0
1 x 35	12,0	16,5
1 x 50	14,0	19,0
1 x 70	15,5	21,0
1 x 95	17,5	23,5
1 x 120	19,0	25,5
1 x 150	21,0	29,0
1 x 185	23,5	31,0
1 x 240	26,5	35,0
1 x 300	29,0	38,5
2 x 1,0	8,4	12,5
2 x 1,5	9,0	13,0
2 x 2,5	10,0	14,0
2 x 4	11,0	15,5
2 x 6	12,0	18,0
2 x 10	14,0	21,0

Number of cores x conductor cross-section	Overall Dia-meter min.	Overall Dia-meter max.
mm^2	mm	mm
CEFR/DA&SA CEHR/DA&SA CEVR/DA&SA		
2 x 16	16,5	24,0
2 x 25	19,5	28,0
2 x 35	22,5	31,5
2 x 50	26,5	36,0
2 x 70	29,5	41,0
2 x 95	34,5	45,0
2 x 120	37,5	49,5
3 x 1,0	9,0	13,0
3 x 1,5	9,6	14,0
3 x 2,5	10,5	15,0
3 x 4	11,5	16,0
3 x 6	13,0	19,5
3 x 10	15,0	22,0
3 x 16	17,5	25,5
3 x 25	21,0	30,0
3 x 35	24,0	33,5
3 x 50	28,5	39,0
3 x 70	32,0	44,0
3 x 95	37,0	48,5
3 x 120	40,0	53,0
3 x 150	44,5	60,5
3 x 185	49,5	64,5

Number of cores x conductor cross-section	Overall Dia-meter min.	Overall Dia-meter max.
mm^2	mm	mm
CEFR/DA&SA		

Number of cores x conductor cross-section	Overall Dia-meter min.	Overall Dia-meter max.
mm^2	mm	mm
CEFR/DA&SA		

CEHR/DA&SA CEVR/DA&SA		
4 x 1,0	10,0	14,0
5 x 1,0	10,5	15,5
7 x 1,0	11,5	17,0
10 x 1,0	15,0	21,5
12 x 1,0	15,5	22,0
14 x 1,0	16,0	23,5
16 x 1,0	17,5	24,5
19 x 1,0	18,0	26,0
24 x 1,0	21,5	30,5
27 x 1,0	22,0	31,0
30 x 1,0	23,0	32,5
33 x 1,0	24,0	33,5
37 x 1,0	25,0	35,0
4 x 1,5	10,5	15,0
5 x 1,5	11,5	16,5
7 x 1,5	12,5	18,0
10 x 1,5	16,0	22,5
12 x 1,5	17,0	23,5
14 x 1,5	17,5	24,5
16 x 1,5	18,5	26,0
19 x 1,5	20,0	27,5
24 x 1,5	23,5	32,5
27 x 1,5	24,0	33,0
30 x 1,5	25,0	34,5
33 x 1,5	26,0	36,0
37 x 1,5	27,0	37,5

CEHR/DA&SA CEVR/DA&SA		
4 x 2,5	11,5	16,5
5 x 2,5	12,5	18,0
7 x 2,5	14,0	19,5
10 x 2,5	18,0	24,5
12 x 2,5	18,5	25,5
14 x 2,5	19,5	27,0
16 x 2,5	20,5	28,5
19 x 2,5	22,0	30,0
24 x 2,5	26,0	35,5
27 x 2,5	27,0	36,5
30 x 2,5	27,5	37,5
33 x 2,5	29,0	39,5
37 x 2,5	30,0	41,0

Application/Limitation

General power and lighting. Control.

The following applies to SA type cables only:

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.

Type Approval documentation

Tests carried out

Standard	Release	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 60092-353	2016-09	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	
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.	

Standard	Release	General description	Limitation
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	Charred portion of sample does not exceed 2,5m above bottom edge of burner.

*SA type only

Marking of product

Hebei Huatong Wires & Cables Group Co.,Ltd. – CEFR/DA or CEFR/SA or CEHR/DA or CEHR/SA or CEVR/DA or CEVR/SA or CEF/DA or CEF/SA or CEH/DA or CEH/SA or CEV/DA or CEV/SA - size - 0,6/1 kV – IEC 60332-3-22* – Lot no.

*SA type only

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