

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Electric Power Cable**

with type designation(s)

CEF80/DA&SA, CEF90/DA&SA, CEH80/DA&SA, CEH90/DA&SA, CEV80/DA&SA, CEV90/DA&SA, CEFR80/DA&SA, CEFR90/DA&SA, CEHR80/DA&SA, CEHR90/DA&SA, CEVR80/DA&SA, CEVR90/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**.for **DNV GL**DNV GL local station: **Tianjin**Approval Engineer: **Carsten Hunsalz****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.



Job Id: **262.1-008108-11**
Certificate No: **TAE000026A**

Product description

Type: CEF80/DA&SA, CEF90/DA&SA, CEH80/DA&SA, CEH90/DA&SA,
CEV80/DA&SA, CEV90/DA&SA, CEFR80/DA&SA, CEFR90/DA&SA,
CEHR80/DA&SA, CEHR90/DA&SA, CEVR80/DA&SA and CEVR90/DA&SA
0,6/1 kV

Construction:

Conductors: Tinned stranded copper

Core insulation: EPR

Inner sheath: SE1 (CEF) SH (CEH) ST2 (CEV)

Metal covering: Copper wire braid or galv. steel wire braid

CEF80/DA&SA CEF90/DA&SA CEH80/DA&SA CEH90/DA&SA CEV80/DA&SA CEV90/DA&SA

Number of cores x conductor cross-section mm ²	Overall Dia- meter min. mm	Overall Dia- meter max. mm
CEF80/DA&SA CEF90/DA&SA CEH80/DA&SA CEH90/DA&SA CEV80/DA&SA CEV90/DA&SA		
1 x 1,0	5,8	8,6
1 x 1,5	6,2	9,0
1 x 2,5	6,6	9,4
1 x 4	7,0	10,0
1 x 6	7,6	10,5
1 x 10	8,4	11,5
1 x 16	9,6	13,5
1 x 25	11,5	15,5
1 x 35	12,5	17,0
1 x 50	14,5	19,0
1 x 70	16,0	21,0
1 x 95	18,0	23,5
1 x 120	19,5	25,0
1 x 150	21,5	27,5
1 x 185	24,0	30,0
1 x 240	26,5	33,0
1 x 300	29,5	36,5
2 x 1,0	9,4	13,5
2 x 1,5	10,5	14,5
2 x 2,5	11,5	16,0
2 x 4	12,5	17,0
2 x 6	13,5	18,0
2 x 10	15,0	20,5
2 x 16	17,5	23,0
2 x 25	20,5	27,0
2 x 35	23,0	29,5
2 x 50	26,0	33,0
2 x 70	29,5	37,5
2 x 95	34,5	43,0
2 x 120	37,5	46,5

Number of cores x conductor cross-section mm ²	Overall Dia- meter min. mm	Overall Dia- meter max. mm
CEF80/DA&SA CEF90/DA&SA CEH80/DA&SA CEH90/DA&SA CEV80/DA&SA CEV90/DA&SA		
3 x 1,0	10,0	14,5
3 x 1,5	11,0	15,5
3 x 2,5	12,0	16,5
3 x 4	13,0	18,0
3 x 6	14,5	19,5
3 x 10	16,0	21,5
3 x 16	18,5	24,0
3 x 25	22,0	28,5
3 x 35	24,5	31,5
3 x 50	28,0	35,5
3 x 70	32,0	40,5
3 x 95	37,0	46,0
3 x 120	40,0	50,0
3 x 150	44,5	54,5
3 x 185	49,0	60,0
4 x 1,0	11,0	16,0
5 x 1,0	12,0	17,0
7 x 1,0	13,0	18,0
10 x 1,0	16,5	22,5
12 x 1,0	17,0	23,0
14 x 1,0	17,5	24,0
16 x 1,0	19,0	25,5
19 x 1,0	19,5	26,5
24 x 1,0	23,0	31,0
27 x 1,0	23,5	32,0
30 x 1,0	24,5	33,0
33 x 1,0	25,5	34,0
37 x 1,0	26,5	35,5

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Number of cores x conductor cross-section	Overall Dia- meter min.	Overall Dia- meter max.
mm ²	mm	mm
CEF80/DA&SA CEF90/DA&SA CEH80/DA&SA CEH90/DA&SA CEV80/DA&SA CEV90/DA&SA		
4 x 1,5	12,0	16,5
5 x 1,5	13,0	18,0
7 x 1,5	14,0	19,5
10 x 1,5	17,5	24,0
12 x 1,5	18,5	24,5
14 x 1,5	19,0	26,0
16 x 1,5	20,0	27,0
19 x 1,5	21,5	28,5
24 x 1,5	25,0	33,0
27 x 1,5	25,5	34,0
30 x 1,5	26,5	35,0
33 x 1,5	28,0	37,0
37 x 1,5	29,0	38,5

Number of cores x conductor cross-section	Overall Dia- meter min.	Overall Dia- meter max.
mm ²	mm	mm
CEF80/DA&SA CEF90/DA&SA CEH80/DA&SA CEH90/DA&SA CEV80/DA&SA CEV90/DA&SA		
4 x 2,5	13,0	17,5
5 x 2,5	14,0	19,0
7 x 2,5	15,5	20,5
10 x 2,5	19,5	26,0
12 x 2,5	20,0	26,5
14 x 2,5	21,0	28,0
16 x 2,5	22,0	29,5
19 x 2,5	23,5	31,0
24 x 2,5	27,5	36,0
27 x 2,5	28,5	37,5
30 x 2,5	29,5	39,0
33 x 2,5	31,0	40,5
37 x 2,5	32,0	42,0

**CEFR80/DA&SA CEFR90/DA&SA CEHR80/DA&SA CEHR90/DA&SA CEVR80/DA&SA
CEVR90/DA&SA**

Number of cores x conductor cross-section	Overall Dia- meter min.	Overall Dia- meter max.
mm ²	mm	mm
CEFR80/DA&SA CEFR90/DA&SA CEHR80/DA&SA CEHR90/DA&SA CEVR80/DA&SA CEVR90/DA&SA		
1 x 1,0	5,8	8,0
1 x 1,5	6,2	8,4
1 x 2,5	6,6	8,8
1 x 4	7,0	9,4
1 x 6	7,6	11,0
1 x 10	8,6	12,0
1 x 16	9,8	14,0
1 x 25	11,5	16,5
1 x 35	13,5	18,0
1 x 50	15,5	20,5
1 x 70	16,5	22,5
1 x 95	19,0	25,0
1 x 120	20,5	27,0
1 x 150	22,5	30,5
1 x 185	25,0	32,5
1 x 240	28,0	36,5
1 x 300	30,5	40,0

Number of cores x conductor cross-section	Overall Dia- meter min.	Overall Dia- meter max.
mm ²	mm	mm
CEFR80/DA&SA CEFR90/DA&SA CEHR80/DA&SA CEHR90/DA&SA CEVR80/DA&SA CEVR90/DA&SA		
2 x 1,0	9,4	13,5
2 x 1,5	10,5	14,5
2 x 2,5	11,5	15,5
2 x 4	12,5	17,0
2 x 6	13,5	19,5
2 x 10	15,5	22,5
2 x 16	18,0	25,5
2 x 25	21,0	29,5
2 x 35	24,0	33,0
2 x 50	28,0	37,5
2 x 70	31,0	42,5
2 x 95	36,5	47,0
2 x 120	39,0	51,5

Number of cores x conductor cross-section	Overall Dia- meter min.	Overall Dia- meter max.
mm ²	mm	mm
CEFR80/DA&SA CEFR90/DA&SA CEHR80/DA&SA CEHR90/DA&SA CEVR80/DA&SA CEVR90/DA&SA		
3 x 1,0	10,0	14,5
3 x 1,5	11,0	15,5
3 x 2,5	12,0	16,5
3 x 4	13,0	17,5
3 x 6	14,5	21,0
3 x 10	16,5	23,5
3 x 16	19,0	27,0
3 x 25	22,5	31,5
3 x 35	25,5	35,0
3 x 50	30,0	40,5
3 x 70	33,5	46,0
3 x 95	39,0	50,5
3 x 120	42,0	55,0
3 x 150	46,5	62,5
3 x 185	51,5	66,5
4 x 1,0	11,0	16,0
5 x 1,0	12,0	17,0
7 x 1,0	13,0	18,5
10 x 1,0	16,5	23,0
12 x 1,0	17,0	23,5
14 x 1,0	17,5	25,0
16 x 1,0	19,0	26,0
19 x 1,0	19,5	27,5
24 x 1,0	23,0	32,0
27 x 1,0	23,5	32,5
30 x 1,0	24,5	34,0
33 x 1,0	25,5	35,0
37 x 1,0	26,5	36,5

Number of cores x conductor cross-section	Overall Dia- meter min.	Overall Dia- meter max.
mm ²	mm	mm
CEFR80/DA&SA CEFR90/DA&SA CEHR80/DA&SA CEHR90/DA&SA CEVR80/DA&SA CEVR90/DA&SA		
4 x 1,5	12,0	16,5
5 x 1,5	13,0	18,0
7 x 1,5	14,0	19,5
10 x 1,5	17,5	24,0
12 x 1,5	18,5	25,0
14 x 1,5	19,0	26,0
16 x 1,5	20,0	27,5
19 x 1,5	21,5	29,0
24 x 1,5	25,0	34,0
27 x 1,5	25,5	34,5
30 x 1,5	26,5	36,0
33 x 1,5	28,0	38,0
37 x 1,5	29,0	39,5
4 x 2,5	13,0	18,0
5 x 2,5	14,0	19,5
7 x 2,5	15,5	21,0
10 x 2,5	19,5	26,0
12 x 2,5	20,0	27,0
14 x 2,5	21,0	28,5
16 x 2,5	22,0	30,0
19 x 2,5	23,5	31,5
24 x 2,5	27,5	37,0
27 x 2,5	28,5	38,5
30 x 2,5	29,5	39,5
33 x 2,5	31,0	41,5
37 x 2,5	32,0	43,0

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 Bundles 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	

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Standard	Release	General description	Limitation
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.	
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. – CEF80/DA or CEF80/SA, or CEF90/DA or CEF90/SA or CEH80/DA or CEH80/SA or CEH90/DA or CEH90/SA or CEV80/DA or CEV80/SA or CEV90/DA or CEV90/SA or CEFR80/DA or CEFR80/SA or CEFR90/DA or CEFR90/SA or CEHR80/DA or CEHR80/SA or CEHR90/DA or CEHR90/SA or CEVR80/DA or CEVR80/SA or CEVR90/DA or CEVR90/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