

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

SPBS 0,6/1 kV, SPBS & SPBS(HD) 2 kV

Issued to

TMC Co., Ltd**CHUNGNAM, Republic of Korea**

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards**IEEE 1580 (2010)****IEC 60332-3-22 (2009-02)****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Type	Voltage class (kV)	Temp. class (°C)
SPBS 0,6/1 kV	0,6/1	100/110
SPBS & SPBS(HD) 2 kV	2	100/110

This Certificate is valid until **2019-11-30**.Issued at **Busan** on **2015-12-01**for **DNV GL**DNV GL local station: **Seoul**Approval Engineer: **Eun Sook Kim**

Baeg Soon Choi
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: **262.1-003643-2**
Certificate No: **TAE00000TC**

Product description

Type: SPBS & SPBS(HD) 2 kV & SPBS 0,6/1 kV
Construction:
Conductors: Tinned, flexible stranded copper
Core insulation: XLPO (Type P & X110)
Inner covering: Tape
Metal covering: Bronze wire braid
Outer sheath: Type N

Number of cores x conductor cross-section	Overall Diameter Approx.	Overall Diameter Approx.
AWG/MCM	mm	inches
SPBS(HD) 2 kV		
1 x 4/0	27,0	1,063
1 x 262	28,5	1,122
1 x 313	30,2	1,189
1 x 373	31,9	1,256
1 x 444	33,8	1,331
1 x 535	36,7	1,445
1 x 646	38,9	1,531
1 x 777	41,1	1,618
1 x 1111	47,8	1,882
SPBS 2 kV		
1 x 18	8,3	0,327
1 x 16	8,4	0,331
1 x 14	8,8	0,346
1 x 12	9,3	0,366
1 x 10	10,0	0,394
1 x 8	11,1	0,437
1 x 6	12,1	0,476
1 x 5	14,7	0,579
1 x 4	15,2	0,598
1 x 3	15,8	0,622
1 x 2	16,4	0,646
1 x 1	18,4	0,724
1 x 1/0	19,6	0,772
1 x 2/0	20,8	0,819
1 x 3/0	23,5	0,925
1 x 4/0	25,2	0,992
1 x 262	27,2	1,071
1 x 313	28,9	1,138
1 x 373	30,6	1,205

Number of cores x conductor cross-section	Overall Diameter Approx.	Overall Diameter Approx.
AWG/MCM	mm	inches
SPBS 0,6/1 kV		
1 x 444	32,5	1,280
1 x 535	35,4	1,394
1 x 646	37,6	1,480
1 x 777	39,8	1,567
1 x 1111	47,5	1,870
SPBS 0,6/1 kV		
1 x 18	7,5	0,295
1 x 16	7,7	0,303
1 x 14	8,0	0,315
1 x 12	8,5	0,335
1 x 10	9,2	0,362
1 x 8	10,6	0,417
1 x 6	11,6	0,457
1 x 5	14,2	0,559
1 x 4	14,7	0,579
1 x 3	15,3	0,602
1 x 2	15,9	0,626
1 x 1	17,9	0,705
1 x 1/0	19,1	0,752
1 x 2/0	20,3	0,799
1 x 3/0	23,0	0,906
1 x 4/0	24,7	0,972
1 x 262	26,7	1,051
1 x 313	28,4	1,118
1 x 373	30,1	1,185
1 x 444	32,0	1,260
1 x 535	34,9	1,374
1 x 646	37,1	1,461
1 x 777	39,3	1,547
1 x 1111	47,5	1,870

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 Bundles of Cables or Wires) are fulfilled without any additional measures.

Type Approval documentation

Tests carried out

Type test according to IEEE 1580, IEEE 1202, UL 1309 and IEC 60332-3-22.

Marking of product

TMC – SPBS or SPBS(HD) 2 kV or SPBS 0,6/1 kV – Size

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Periodical assessment

The scope of the retention/renewal survey is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and 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.

Survey to be performed at least every second year.

END OF CERTIFICATE