

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

DPNBS & TPNBS & FPNBS & QPNBS 0,6/1 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.****Voltage class (kV) 0,6/1****Temp. class (°C) 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: **TAE00000TE**

Product description

Type: DPNBS & TPNBS & FPNBS & QPNBS 0,6/1 kV
Construction:
Conductors: Tinned, flexible stranded copper
Core insulation: XLPO (Type P & X110)
Inner sheath: Type N
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
DPNBS		
2 x 14	14,8	0,583
2 x 12	15,8	0,622
2 x 10	17,2	0,677
2 x 8	20,6	0,811
2 x 6	23,8	0,937
2 x 5	27,2	1,071
2 x 4	29,3	1,154
2 x 3	30,5	1,201
2 x 2	31,8	1,252
2 x 1	35,8	1,409
2 x 1/0	38,2	1,504
2 x 2/0	40,6	1,598
2 x 3/0	45,2	1,780
2 x 4/0	48,6	1,913
2 x 262	54,2	2,134
TPNBS		
3 x 16	14,6	0,575
3 x 14	15,4	0,606
3 x 12	16,4	0,646
3 x 10	18,0	0,709
3 x 8	22,5	0,886
3 x 6	24,9	0,980
3 x 5	29,6	1,165
3 x 4	30,7	1,209
3 x 3	32,1	1,264
3 x 2	33,4	1,315
3 x 1	37,7	1,484
3 x 1/0	40,3	1,587
3 x 2/0	44,4	1,748
3 x 3/0	47,7	1,878
3 x 4/0	52,9	2,083
3 x 262	57,3	2,256
3 x 313	61,0	2,402
3 x 373	64,7	2,547
3 x 444	68,8	2,709
3 x 535	76,4	3,008

Number of cores x conductor cross-section	Overall Diameter Approx.	Overall Diameter Approx.
AWG/MCM	mm	inches
3 x 646	82,7	3,256
3 x 777	87,4	3,441
FPNBS		
4 x 14	16,3	0,642
4 x 12	17,4	0,685
4 x 10	19,9	0,783
4 x 8	24,1	0,949
4 x 6	26,7	1,051
4 x 5	32,0	1,260
4 x 4	33,2	1,307
4 x 3	34,7	1,366
4 x 2	36,1	1,421
4 x 1	41,0	1,614
4 x 1/0	45,4	1,787
4 x 2/0	48,3	1,902
4 x 3/0	53,5	2,106
4 x 4/0	57,6	2,268
4 x 262	62,6	2,465
4 x 313	66,7	2,626
4 x 373	72,3	2,846
4 x 444	76,9	3,028
4 x 535	85,3	3,358
4 x 646	90,6	3,567
QPNBS		
5 x 14	17,3	0,681
5 x 12	19,3	0,760
5 x 10	22,1	0,870
5 x 8	25,8	1,016
5 x 6	29,8	1,173
5 x 4	36,6	1,441
5 x 2	39,6	1,559
5 x 1	46,6	1,835
5 x 1/0	49,8	1,961
5 x 2/0	54,6	2,150
5 x 3/0	58,8	2,315
5 x 4/0	63,4	2,496

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.

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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 – DPNBS or TPNBS or FPNBS or QPNBS– Size - 0,6/1 kV

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