

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)
TPNBS(VFD) 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.

Voltage class (kV) 2
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.

Product description

Type:	TPNBS(VFD) 2kV
Construction:	
Conductors:	Tinned, flexible stranded copper
Core insulation:	XLPO (Type P & X110)
Shield :	Copper wire braid + AL/PS tape
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
For equipment grounding applications		
3 x 14	24,6	0,969
3 x 12	25,7	1,012
3 x 10	27,2	1,071
3 x 8	31,3	1,232
3 x 6	33,3	1,311
3 x 4	38,4	1,512
3 x 2	40,8	1,606
3 x 1	44,8	1,764
3 x 1/0	47,4	1,866
3 x 2/0	50,0	1,969
3 x 3/0	54,9	2,161
3 x 4/0	58,6	2,307
3 x 262	62,9	2,476

Number of cores x conductor cross-section	Overall Diameter Approx.	Overall Diameter Approx.
AWG/MCM	mm	inches
For system grounding applications		
3 x 313	66,6	2,622
3 x 373	71,7	2,823
3 x 444	75,8	2,984
3 x 535	83,6	3,291
3 x 646	88,3	3,476
3 x 777	93,1	3,665
For system grounding applications		
3 x 3/0	60,3	2,374
3 x 4/0	66,3	2,610
3 x 262	72,8	2,866
3 x 313	75,3	2,965
3 x 373	78,8	3,102
3 x 444	85,8	3,378
3 x 535	93,3	3,673

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 Bunches 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 – TPNBS(VFD) – Size - 2 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.



Job Id: **262.1-003643-2**
Certificate No: **TAE00000TG**

END OF CERTIFICATE