

TYPE APPROVAL CERTIFICATE

Certificate No:

TAED00004X
DNV GL

This is to certify:

That the Electric Power Cable

with type designation(s)

BUOU & BUBU & BUCU 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

IEC 60092-353 (2011-08)

IEC 60331-1/2 (2009-05)

IEC 60332-3-22 (2009-02)

IEC 60754-1/2 (2011-11)

IEC 61034-2 Ed. 3.1 (2013-06)

NEK TS 606 (2009-05)

Application :

General power and lighting. Fire resistance. Flame retardant Cat.A. Halogen free. Low smoke.

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)	90

This Certificate is valid until **2019-09-07**.

Issued at **Busan** on **2015-09-08**

DNV GL local station: **Seoul**

for **DNV GL**

Approval Engineer: **Dong Ho Park**

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: BUOU & BUCU & BUBU 0.6/1 kV

Conductors: Tinned stranded copper class 2
Core insulation: Mica tape + HF EPR
Inner sheath: SHF2
Metal covering: Tinned copper wire braid (O) or Galv. steel wire (C) or Bronze wire (B)
Outer sheath: SHF2 or SHF Mud

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
BUOU/BUBU	
1 x 1,5	9.8±0.7
1 x 2,5	10.2±0.7
1 x 4	10.7±0.7
1 x 6	11.3±0.8
1 x 10	12.4±0.8
1 x 16	13.8±0.9
1 x 25	15.5±0.9
1 x 35	16.6±1.0
1 x 50	18.6±1.0
1 x 70	20.5±1.1
1 x 95	23.0±1.2
1 x 120	25.0±1.3
1 x 150	27.2±1.4
1 x 185	29.9±1.5
1 x 240	33.3±1.6
1 x 300	36.7±1.8
BUOU/BUBU/ BUCU	
2 x 1,5	14.1±0.9
2 x 2,5	15.3±0.9
2 x 4	16.3±1.0
2 x 6	17.5±1.0
2 x 10	19.5±1.1
2 x 16	21.9±1.2
2 x 25	25.7±1.3
2 x 35	28.3±1.4
2 x 50	32.5±1.6
2 x 70	36.7±1.8
2 x 95	42.3±2.0
2 x 120	45.9±2.1
2 x 150	50.1±2.3
2 x 185	55.1±2.5
2 x 240	61.9±2.8
2 x 300	68.3±3.0
2 x 1,5 + E	14.7±0.9
2 x 2,5 + E	16.0±0.9
2 x 4 + E	17.1±1.0
2 x 6 + E	18.6±1.0

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
2 x 10 + E	20.9±1.1
2 x 16 + E	23.1±1.2
2 x 25 + E	26.9±1.4
2 x 35 + E	29.9±1.5
2 x 50 + E	33.5±1.6
2 x 70 + E	37.7±1.8
2 x 95 + E	43.3±2.0
2 x 120 + E	47.4±2.2
2 x 150 + E	51.9±2.4
2 x 185 + E	56.5±2.6
2 x 240 + E	63.3±2.8
3 x 1,5	14.7±0.9
3 x 2,5	16.0±0.9
3 x 4	17.1±1.0
3 x 6	18.6±1.0
3 x 10	20.9±1.1
3 x 16	23.1±1.2
3 x 25	27.5±1.4
3 x 35	30.3±1.5
3 x 50	35.0±1.7
3 x 70	39.4±1.9
3 x 95	45.0±2.1
3 x 120	48.8±2.3
3 x 150	53.3±2.4
3 x 185	59.1±2.7
3 x 240	66.1±2.9
3 x 300	73.2±3.2
3 x 1,5 + E	16.2±0.9
3 x 2,5 + E	17.2±1.0
3 x 4 + E	18.6±1.0
3 x 6 + E	20.0±1.1
3 x 10 + E	22.6±1.2
3 x 16 + E	25.4±1.3
3 x 25 + E	29.8±1.5
3 x 35 + E	32.8±1.6
3 x 50 + E	37.5±1.8
3 x 70 + E	42.2±2.0
3 x 95 + E	48.2±2.2

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
3 x 120 + E	52.7±2.4
3 x 150 + E	57.6±2.6
3 x 185 + E	63.2±2.8
3 x 240 + E	70.9±3.1
4 x 1,5	16.2±0.9
4 x 2,5	17.2±1.0
4 x 4	18.6±1.0
4 x 6	20.0±1.1
4 x 10	22.6±1.2
4 x 16	25.4±1.3
4 x 25	30.3±1.5
4 x 35	33.4±1.6
4 x 50	38.9±1.9
4 x 70	43.4±2.0
4 x 95	50.0±2.3
4 x 120	54.2±2.5
4 x 150	59.2±2.7
4 x 185	65.3±2.9
4 x 240	73.6±3.2
4 x 300	81.3±3.6
4 x 1,5 + E	17.4±1.0
4 x 2,5 + E	18.7±1.0
4 x 4 + E	20.0±1.1
4 x 6 + E	22.0±1.2
4 x 10 + E	24.9±1.3
4 x 16 + E	28.0±1.4
4 x 25 + E	32.6±1.6
4 x 35 + E	36.6±1.8
4 x 50 + E	41.8±2.0
4 x 70 + E	46.6±2.2
4 x 95 + E	53.5±2.4
4 x 120 + E	58.6±2.6
4 x 150 + E	64.3±2.9
4 x 185 + E	70.3±3.1
4 x 240 + E	78.9±3.5
5 x 1,0	16.6±1.0
7 x 1,0	17.9±1.0

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
9 x 1,0	20.2±1.1
12 x 1,0	22.7±1.2
14 x 1,0	23.9±1.3
16 x 1,0	25.2±1.3
19 x 1,0	26.7±1.4
24 x 1,0	30.9±1.5
27 x 1,0	31.5±1.6
30 x 1,0	32.7±1.6
37 x 1,0	35.7±1.7
44 x 1,0	40.1±1.9
5 x 1,5	17.4±1.0

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
7 x 1,5	18.8±1.1
9 x 1,5	21.7±1.2
12 x 1,5	24.1±1.3
14 x 1,5	25.4±1.3
16 x 1,5	27.0±1.4
19 x 1,5	28.2±1.4
24 x 1,5	33.1±1.6
27 x 1,5	33.7±1.6
30 x 1,5	35.2±1.7
37 x 1,5	38.0±1.8
44 x 1,5	42.9±2.0

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
5 x 2,5	18.7±1.0
7 x 2,5	20.0±1.1
9 x 2,5	23.2±1.2
12 x 2,5	26.0±1.3
14 x 2,5	27.6±1.4
16 x 2,5	29.1±1.5
19 x 2,5	30.6±1.5
24 x 2,5	36.1±1.7
27 x 2,5	36.8±1.8
30 x 2,5	38.6±1.8
37 x 2,5	41.6±2.0
44 x 2,5	46.5±2.2

Application/Limitation

This type of cable is fire resistant in accordance with IEC Publication 60331.

The requirement of SOLAS Chapter II-1 Part D Reg. 45, 5.2 to limit Fire Propagation along Bunches of Cables or Wires are fulfilled without any additional measures.

Type Approval documentation Tests carried out

IEC 60092-353 (2011-08)
IEC 60331-1/-2 (2009-05)
IEC 60332-3-22 (2009-02)
IEC 60754-1/-2 (2011-11)
IEC 61034-1/-2 (2005-04)
NEK TS 606 (2009-05)

CSA C22.2 No.03 / 38 (Cold impact -35°C / Cold bend -40°C)
ASTM D 2863 (Oxygen resistance – Min.32)

Marking of product

0.6/1 kV – Type designation – IEC 60331 (120) – IEC 60332 Cat.A – Size – TMC – Year of manufacture
– Length

Periodical assessment

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

The main elements of the survey are:

Job Id: **262.1-003020-4**
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- Inspection on factory samples, selected at random from the production line (where practicable)
- Check of the results from Production Sample Tests(PST) and Routine Tests(RT)
(if not available, PST and RT are to be carried out)
- Review of type approval documentation
- Review of possible changes in design, material and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate

Survey is to be performed at least every second year.

END OF CERTIFICATE