

TYPE APPROVAL CERTIFICATE

Certificate No:

TA000000AU
DNV GL

This is to certify:

That the High Voltage Cable

with type designation(s)

RUOU & RUBU & RUCU 3.6/6 kV & 6/10 kV & 8.7/15 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

IEC60092-354 (2014-08)

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. 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 (kV)	3.6/6 & 6/10 & 8.7/15
Temp. class (°C)	90

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

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

for **DNV GL**

DNV GL local station: **Seoul**

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: RUOU & RUCU & RUBU 3.6/6 kV & 6/10 kV & 8.7/15 kV

Conductors:	Tinned stranded copper
Core insulation:	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

3.6/6 kV

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
RUOU/RUBU	
1 x 10	21,2±1,3
1 x 16	22,2±1,4
1 x 25	23,9±1,5
1 x 35	25,1±1,5
1 x 50	26,6±1,6
1 x 70	28,8±1,7
1 x 95	30,7±1,7
1 x 120	32,7±1,8
1 x 150	34,5±1,9
1 x 185	37,0±2,0
1 x 240	40,5±2,1
1 x 300	44,1±2,3

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
1 x 400	48,3±2,4
1 x 500	51,8±2,6
1 x 630	56,6±2,8
RUOU/RUBU/ RUCU	
3 x 10	39,7±2,1
3 x 16	42,1±2,2
3 x 25	45,3±2,3
3 x 35	48,3±2,4
3 x 50	51,3±2,6
3 x 70	55,7±2,7
3 x 95	60,6±2,9
3 x 120	64,3±3,1

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
3 x 150	68,1±3,2
3 x 185	72,6±3,4
3 x 240	79,7±3,7
3 x 25 + E	45,3±2,3
3 x 35 + E	49,1±2,5
3 x 50 + E	51,8±2,6
3 x 70 + E	56,4±2,8
3 x 95 + E	61,4±3,0
3 x 120 + E	66,0±3,1
3 x 150 + E	70,5±3,3
3 x 185 + E	74,6±3,5
3 x 240 + E	81,7±3,8

6/10 kV

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
RUOU/RUBU	
1 x 16	24,4±1,5
1 x 25	25,9±1,5
1 x 35	27,3±1,6
1 x 50	28,8±1,7
1 x 70	30,6±1,7
1 x 95	32,9±1,8
1 x 120	34,7±1,9
1 x 150	37,0±2,0
1 x 185	39,0±2,1
1 x 240	42,5±2,2
1 x 300	45,3±2,3
1 x 400	49,3±2,5

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
1 x 500	52,4±2,6
1 x 630	57,0±2,8
RUOU/RUBU/ RUCU	
3 x 16	46,6±2,4
3 x 25	49,8±2,5
3 x 35	52,7±2,6
3 x 50	55,7±2,7
3 x 70	60,2±2,9
3 x 95	64,9±3,1
3 x 120	69,0±3,3
3 x 150	72,6±3,4

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
3 x 185	76,9±3,6
3 x 240	84,6±3,9
3 x 25 + E	49,8±2,5
3 x 35 + E	53,0±2,6
3 x 50 + E	55,7±2,7
3 x 70 + E	60,5±2,9
3 x 95 + E	65,4±3,1
3 x 120 + E	69,8±3,3
3 x 150 + E	74,6±3,5
3 x 185 + E	78,5±3,6
3 x 240 + E	86,2±3,9

8.7/15 kV

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
RUOU/RUBU	
1 x 25	28,3±1,6
1 x 35	29,7±1,7
1 x 50	31,2±1,7
1 x 70	33,2±1,8
1 x 95	36,0±1,9
1 x 120	37,8±2,0
1 x 150	39,6±2,1
1 x 185	41,6±2,2
1 x 240	45,1±2,3
1 x 300	47,9±2,4
1 x 400	51,7±2,6

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
1 x 500	54,8±2,7
1 x 630	59,4±2,9
RUOU/RUBU RUCU	
3 x 25	55,1±2,7
3 x 35	58,1±2,8
3 x 50	61,3±3,0
3 x 70	65,6±3,1
3 x 95	70,3±3,3
3 x 120	74,1±3,5
3 x 150	78,2±3,6
3 x 185	82,4±3,8

Number of cores x conductor cross-section	Overall diameter
mm ²	mm
3 x 240	90,1±4,1
3 x 25 + E	55,1±2,7
3 x 35 + E	58,1±2,8
3 x 50 + E	61,3±3,0
3 x 70 + E	65,6±3,1
3 x 95 + E	70,3±3,3
3 x 120 + E	74,7±3,5
3 x 150 + E	79,2±3,7
3 x 185 + E	83,3±3,8
3 x 240 + E	90,9±4,1

Application/Limitation

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 60092-354 (2014-08)
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

Voltage rating – Type designation – 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:

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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



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