

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)
150/250 V EOY, EOY(C), EOY(I/C)

Issued to

TMC Co., Ltd
Cheonan-si, Chungcheongnam-do, Republic of Korea

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft
IEC 60092-376 (2017-05)

Application :

Instrumentation and communication.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Rated voltage (V) 150/250
Temp. class (°C) 90

Issued at **Busan** on **2019-04-11**

This Certificate is valid until **2023-12-31**.

DNV GL local station: **Seoul**

for **DNV GL**

Approval Engineer: **Eun Jin Lee**

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Andreas Kristoffersen
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 : 150/250 V EOY, EOY(C) & EOY(I/C) 250 V

Conductors: Stranded tinned annealed copper wires, Class 2
Fire resistant layer: Mica/glass tape
Core insulation: HEPR
Individual screen: AL/PS tape with drain wire(I)
Collective screen: AL/PS tape with drain wire(C)
Metal covering: Plain annealed copper wire braid
Outer sheath: ST2

Number of cores x conductor cross-section mm ²	Number of cores x conductor cross-section mm ²	Number of cores x conductor cross-section mm ²	Number of cores x conductor cross-section mm ²	Number of cores x conductor cross-section mm ²
EOY & EOY(C)	14x2x0.75	37x2x1.0	3x3x0.75	19x3x1.0
2x1.0	15x2x0.75	48x2x1.0	4x3x0.75	20x3x1.0
3x1.0	19x2x0.75		5x3x0.75	24x3x1.0
4x1.0	20x2x0.75	1x2x1.5	7x3x0.75	27x3x1.0
5x1.0	24x2x0.75	2x2x1.5	10x3x0.75	30x3x1.0
7x1.0	27x2x0.75	3x2x1.5	12x3x0.75	33x3x1.0
9x1.0	30x2x0.75	4x2x1.5	14x3x0.75	37x3x1.0
12x1.0	33x2x0.75	5x2x1.5	15x3x0.75	48x3x1.0
16x1.0	37x2x0.75	7x2x1.5	19x3x0.75	
19x1.0	48x2x0.75	10x2x1.5	20x3x0.75	1x3x1.5
23x1.0		12x2x1.5	24x3x0.75	2x3x1.5
27x1.0	1x2x1.0	14x2x1.5	27x3x0.75	3x3x1.5
33x1.0	2x2x1.0	15x2x1.5	30x3x0.75	4x3x1.5
37x1.0	3x2x1.0	19x2x1.5	33x3x0.75	5x3x1.5
44x1.0	4x2x1.0	20x2x1.5	37x3x0.75	7x3x1.5
77x1.0	5x2x1.0	24x2x1.5	48x3x0.75	10x3x1.5
	7x2x1.0	27x2x1.5		12x3x1.5
	10x2x1.0	30x2x1.5	1x3x1.0	14x3x1.5
EOY(C), EOY(I/C)	12x2x1.0	33x2x1.5	2x3x1.0	15x3x1.5
1x2x0.75	14x2x1.0	37x2x1.5	3x3x1.0	19x3x1.5
2x2x0.75	15x2x1.0	48x2x1.5	4x3x1.0	20x3x1.5
3x2x0.75	19x2x1.0		5x3x1.0	24x3x1.5
4x2x0.75	20x2x1.0	5x2x4.0	7x3x1.0	27x3x1.5
5x2x0.75	24x2x1.0	10x2x4.0	10x3x1.0	30x3x1.5
7x2x0.75	27x2x1.0		12x3x1.0	33x3x1.5
10x2x0.75	30x2x1.0	1x3x0.75	14x3x1.0	37x3x1.5
12x2x0.75	33x2x1.0	2x3x0.75	15x3x1.0	48x3x1.5

Application/Limitation

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

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

Standard	Release	General description	Limitation
IEC 60092-350	2014-08	Low voltage shipboard power cables General construction and test requirements	

Job Id: **262.1-007118-3**
Certificate No: **TAE00003GV**

Standard	Release	General description	Limitation
IEC 60092-376	2017-05	Cables for control and instrumentation circuits 150/250 V (300 V)	
IEC 60092-360	2014-04	Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation, telecommunication cables	
IEC 60331-21	1994-04	Fire resistance / Circuit Integrity – test for fire alone of at least 750 °C	90 min. test
IEC 60331-1/-2	2018-03	Tests for electric cables under fire conditions. Part 1 : Test method for fire with shock at a temperature of at least 830°C for cables of rated voltage up to and including 0.6/1.0kV and with an overall diameter exceeding 20mm. Part 2 : Test method for fire with shock at a temperature of at least 803°C for cables of rated voltage up to and including 0.6/1.0kV and with an overall diameter not exceeding 20mm.	120 min. test
IEC 60332-3-22	2018-07	Flame retardance in bunch	Cat. A
IEC 60811-504	2012-03	Bending tests at low temperature for insulation and sheaths	@-30°C
IEC 60811-506	2012-03	Impact test at low temperature for insulations and sheaths	@-30°C
CSA C22.2 No.03	2009	4.12 Flexibility at any specified temperature	Cold bend: -40°C
CSA C22.2 No.03	2009	4.13 Abnormal low temperature – impact	Cold impact: -35°C

Marking of product

250V – Type designation – size – IEC 60332-3-2 CAT-A – IEC 60331-2(120) - TMC – year - length

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.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE