DNV·GL

Certificate No:
TAE00003GJ

TYPE APPROVAL CERTIFICATE

This is to certify:

That the High Voltage Cable

with type designation(s)
3.6/6 kV PCY, POY & PBY, 6/10 kV PCY, POY & PBY, 8.7/15 kV PCY, POY & PBY, 12/20 kV PCY, POY & PBY

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 60092-354 (2014-08)

Application :

Power.

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

Type	Rated voltage (kV)	Temp. class (°C)
3.6/6 kV PCY, POY & PBY	3.6/6	90
6/10 kV PCY, POY & PBY	6/10	90
8.7/15 kV PCY, POY & PBY	8.7/15	90
12/20 kV PCY, POY & PBY	12/20	90

Issued at **Busan** on **2019-04-11**
This Certificate is valid until **2023-12-31**.
DNV GL local station: **Seoul**

Approval Engineer: **Eun Jin Lee**

for **DNV GL**

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.

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Job Id: **262.1-007118-3**
Certificate No: **TAE00003GJ**

Product description

Type: 3.6/6 kV PCY, POY & PBY
6/10 kV PCY, POY & PBY
8.7/15 kV PCY, POY & PBY
12/20 kV PCY, POY & PBY

Conductors:	Stranded tinned annealed copper wires, Class 2
Conductor screen:	Semi-conducting layer (tape / compound)
Core insulation:	EPR
Insulation screen:	Non-metallic part : Semi-conducting layer (tape / compound) Metallic part : Copper tape with about 0.1mm thickness A suitable separator tape(s) may be applied over the metallic part
Inner sheath:	ST2
Metal covering:	C_Galvanized steel wire braid O_Plain copper wire braid B_Bronze wire braid
Outer sheath:	ST2

3.6/6kV

Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²
POY, PBY	1 x 95	PCY, POY, PBY	3 x 70
1 x 10	1 x 120		3 x 95
1 x 16	1 x 150	3 x 10	3 x 120
1 x 25	1 x 185	3 x 16	3 x 150
1 x 35	1 x 240	3 x 25	3 x 185
1 x 50	1 x 300	3 x 35	3 x 240
1 x 70		3 x 50	3 x 300

6/10kV

Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²
POY, PBY	1 x 120	PCY, POY, PBY	3 x 95
1 x 16	1 x 150		3 x 120
1 x 25	1 x 185	3 x 16	3 x 150
1 x 35	1 x 240	3 x 25	3 x 185
1 x 50	1 x 300	3 x 35	3 x 240
1 x 70		3 x 50	3 x 300
1 x 95		3 x 70	

8.7/15kV

Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²	Number of cores x conductor cross-section mm²
POY, PBY	1x95	1x300	3x35
1x25	1x120		3x50
1x35	1x150	PCY, POY, PBY	3x70
1x50	1x185		3x95
1x70	1x240	3x25	3x120

Number of cores x conductor cross-section mm²
3x150

Number of cores x conductor cross-section mm²
3x185

Number of cores x conductor cross-section mm²
3x240

Number of cores x conductor cross-section mm²
3x300

12/20kV

Number of cores x conductor cross-section mm²
POY, PBY
1x35
1x50
1x70
1x95
1x120

Number of cores x conductor cross-section mm²
1x150
1x185
1x240
1x300
PCY, POY,

Number of cores x conductor cross-section mm²
PBY
3x35
3x50
3x70
3x95
3x120

Number of cores x conductor cross-section mm²
3x150
3x185
3x240
3x300

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

Standard	Release	General description	Limitation
IEC 60092-350	2014-08	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-360	2014-04	Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables	
IEC 60092-354	2014-08	Single- and three-core power cables with extruded solid insulation for rated voltages 6 kV (Um = 7,2 kV) up to 30 kV (Um = 36 kV)	
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

Voltage rating – Type designation - size – IEC 60332-3-2 CAT-A – 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