

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Electric Power Cable

with type designation(s)

PYCY, PYOY, PYBY, PYCY(C), PYOY(C), PYBY(C), PYOY(I/C), FX-PYOY(VFD)

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 60092-353 (2016-09)

Application :

General power and lighting. Control. Flame retardant Cat.A. Cold bend(-40°C)/Cold impact(-35°C)

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

Rated voltage (kV) 0.6/1

Temp. class (°C) 90

Issued at **Busan** on **2017-09-13**

This Certificate is valid until **2022-09-12**.

for **DNV GL**

DNV GL local station: **Seoul**

Approval Engineer: **Eun Jin Lee**

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Michael Jost Auf der Stroth
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 : PYCY, PYOY, PYBY, PYCY(C), PYOY(C), PYBY(C), PYOY(I/C), FX-PYOY(VFD)

Conductors : Stranded tinned annealed copper wires, class 2 or class 5(for FX-type)
Core insulation : HEPR
Inner sheath : ST2
Armor : Galvanized steel wire braid(C-)/Copper wire braid(O-)/Bronze wire braid(B-)
Outer sheath : ST2

Number of cores x conductor corss-section mm ²	Number of cores x conductor corss-section mm ²	Number of cores x conductor corss-section mm ²	Number of cores x conductor corss-section mm ²
PYOY, PYBY, PYOY(C), PYBY(C)	2 x 300	3 x 35 + E	4 x 300 + E
1 x 1.5	2 x 1.5 + E	3 x 50 + E	5 x 1.5
1 x 2.5	2 x 2.5 + E	3 x 70 + E	5 x 2.5
1 x 4	2 x 4 + E	3 x 95 + E	5 x 4
1 x 6	2 x 6 + E	3 x 120 + E	5 x 6
1 x 10	2 x 10 + E	3 x 150 + E	6 x 1.5
1 x 16	2 x 16 + E	3 x 185 + E	6 x 2.5
1 x 25	2 x 25 + E	3 x 240 + E	6 x 4
1 x 35	2 x 35 + E	3 x 300 + E	6 x 6
1 x 50	2 x 50 + E		10 x 1.5
1 x 70	2 x 70 + E	4 x 1.5	10 x 2.5
1 x 95	2 x 95 + E	4 x 2.5	10 x 4
1 x 120	2 x 120 + E	4 x 4	10 x 6
1 x 150	2 x 150 + E	4 x 6	
1 x 185	2 x 185 + E	4 x 10	1 x 2 x 2.5
1 x 240	2 x 240 + E	4 x 16	PYOY(I/C)
1 x 300	2 x 300 + E	4 x 25	5 x 2 x 1.5
1 x 400		4 x 35	5 x 2 x 2.5
1 x 500	3 x 1.5	4 x 50	5 x 2 x 4
1 x 630	3 x 2.5	4 x 70	5 x 2 x 6
PYCY, PYOY, PYBY, PYCY(C), PYOY(C), PYBY(C)	3 x 4	4 x 95	10 x 2 x 1.5
2 x 1.5	3 x 6	4 x 120	10 x 2 x 2.5
2 x 2.5	3 x 10	4 x 150	10 x 2 x 4
2 x 4	3 x 16	4 x 185	10 x 2 x 6
2 x 6	3 x 25	4 x 240	
2 x 10	3 x 35	4 x 300	FX-PYOY(VFD)
2 x 16	3 x 50	4 x 1.5 + E	3 x 4
2 x 25	3 x 70	4 x 2.5 + E	3 x 6
2 x 35	3 x 95	4 x 4 + E	3 x 10
2 x 50	3 x 120	4 x 6 + E	3 x 16
2 x 70	3 x 150	4 x 10 + E	3 x 25
2 x 95	3 x 185	4 x 16 + E	3 x 35
2 x 120	3 x 240	4 x 25 + E	3 x 50
2 x 150	3 x 300	4 x 35 + E	3 x 70
2 x 185	3 x 1.5 + E	4 x 50 + E	3 x 95
2 x 240	3 x 2.5 + E	4 x 70 + E	3 x 120
	3 x 4 + E	4 x 95 + E	3 x 150
	3 x 6 + E	4 x 120 + E	3 x 185
	3 x 10 + E	4 x 150 + E	3 x 240
	3 x 16 + E	4 x 185 + E	3 x 300
	3 x 25 + E	4 x 240 + E	

Application/Limitation

Job Id: **262.1-025882-1**
Certificate No: **TAE000023G**

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 60092-353	2016-09	Power cables for rated voltages 1kV and 3kV	
IEC 60092-360	2014-04	Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation, telecommunication cables	
IEC 60332-3-22	2009-02	Tests on electric and optical fibre cables under fire conditions - Part 3-22: Test for vertical flame spread of vertically-mounted bunched wires or cables - Category A	Bunch test Category A
CSA C22.2 No. 03	2009-09	5.11 Flexibility at any specified temperature	Cold bend: -40°C
CSA C22.2 No. 03	2009-09	5.12 Abnormal low temperature – impact	Cold impact: -35°C

Marking of product

0.6/1kV – Type designation – size – IEC 60332-3-2 Cat.A – 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 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 and at renewal of this certificate.