

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Low Voltage Cable

with type designation(s)

250V FR-(FA-)MPYCY(C), FR-(FA-)MPYCYSLA(C), FR-(FA-)MPYCYESLA(C), FR-(FA-)MPYCY-S(C), FR-(FA-)MPYCYE-S(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
JIS C 3410:2010**

Application :

Instrumentation and communication. Fire resistant. Flame retardant.

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

Voltage class (V) 250

Temp. class (°C) 90

This Certificate is valid until **2021-10-11**.

Issued at **Busan** on **2016-10-12**

DNV GL local station: **Seoul**

for **DNV GL**

Approval Engineer: **Dong Ho Park**

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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 : 250V FR-(FA-)MPYCY(C*), FR-(FA-)MPYCYSLA(C*), FR-(FA-)MPYCYESLA(C*), FR-(FA-)MPYCY-S(C*), FR-(FA-)MPYCYE-S(C*)

Conductor :	Stranded tinned annealed copper wires
Fire resisting layer :	Mica/glass tape
Insulation :	EPR
Individual shield :	Tinned copper wire braid ('-S' type only)
Common shield :	AL/PS tape with tinned copper drain wire ('SLA' type only)
Inner sheath :	PVC
Armour :	Braid of galvanized steel wire(C)
Outer sheath :	PVC

* Cable type with 'C' for cold resistant characteristic (option)

Number of cores x conductor cross-section mm ²
FR-(FA-)MPYCY(C)
2x1.0
4x1.0
7x1.0
12x1.0
19x1.0
27x1.0
37x1.0
44x1.0
FR-(FA-)MPYCYSLA(C)
4x1.0
7x1.0
12x1.0

Number of cores x conductor cross-section mm ²
27x1.0
37x1.0
44x1.0
FR-(FA-)MPYCYESLA(C)
3x1.0+E
6x1.0+E
11x1.0+E
26x1.0+E
36x1.0+E
43x1.0+E
FR-(FA-)MPYCY-S(C)
4x1.0
7x1.0

Number of cores x conductor cross-section mm ²
12x1.0
27x1.0
37x1.0
44x1.0
FR-(FA-)MPYCYE-S(C)
3x1.0+E
6x1.0+E
11x1.0+E
26x1.0+E
36x1.0+E
43x1.0+E

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 for 'FA-' type only.

Type Approval documentation

Tests carried out

Standard	Issued	Limitation
JIS 3410	2010	
IEC 60331-1/-2 (As JIS 3410, 7.8)	2009	
IEC 60331-21(As JIS 3410, 7.8)	1999	
IEC 60332-1(As JIS 3410, 7.6)	2004	
IEC 60332-3-22 (As JIS 3410, 7.7)	2009	'FA-' type only
CSA C22.2 No.03	2009	'C' type only

Marking of product

250V – Cable type – Size – IEC 60331 – TMC – Year of manufacture – Length or
250V – Cable type – Size – IEC 60331 – IEC 60332-3 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 Certificate are complied with and that no alterations are made to the design and/or the material of product.

Job Id: **262.1-015062-2**
Certificate No: **TAE00001EM**

The main elements of the survey are:

- 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, PSTand 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