



Certificate No:  
**TAE00004D0**

# TYPE APPROVAL CERTIFICATE

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## This is to certify:

**That the Low Voltage Cable**

with type designation(s)

**EICI, EIOI, EIBI, EICI(C), EIOI(C), EIBI(C0), EIOI(I), EIBI(I), EIOI(I/C), EIBI(I/C)**

Issued to

**LS Cable & System Ltd (Donghae Plant)**  
**Donghae-si, Gangwon-do, Korea, Republic of**

is found to comply with

**DNV rules for classification – Ships, offshore units, and high speed and light craft**  
**IEC 60092-376 (2017-05)**

## Application :

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

### Control and instrumentation cable

**Rated voltage (V) 250**

**Temp. class (°C) 90**

Issued at **Busan** on **2021-11-22**

This Certificate is valid until **2026-11-21**.

for **DNV**

DNV local station: **Seoul**

Approval Engineer: **Eun Jin Lee**

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**Hanwee Low**  
**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Form code: TA 251

Revision: 2021-03

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Page 1 of 3

## Product description

Type designation : 250V EICI, EIOI, EIBI, EICI(C), EIOI(C), EIBI(C), EIOI(I), EIBI(I), EIOI(I/C), EIBI(I/C)

|               |                                                                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Conductors:   | Tinned stranded copper, class 2                                                                                                                                      |
| Insulation:   | Mica + HF HEPR                                                                                                                                                       |
| Screen:       | (C): Collective screen with drain wire, Aluminium/polyester tape<br>(I): Individual screen with drain wire,<br>(I/C): Individual & collective screen with drain wire |
| Inner sheath: | SHF1                                                                                                                                                                 |
| Aarmor :      | Galvanized steel(C), Bronze(B) or Copper(O) wire braid                                                                                                               |
| Outer sheath: | SHF1                                                                                                                                                                 |

| Cable type                                               | No. of Pairs | Conductor size(mm <sup>2</sup> ) |
|----------------------------------------------------------|--------------|----------------------------------|
| EICI, EIOI, EIBI, EICI(C), EIOI(C), EIBI(C)              | 2C~77C       | 1.0                              |
| EIOI(C), EIBI(C), EIOI(I), EIBI(I), EIOI(I/C), EIBI(I/C) | 1P~48P       | 0.75, 1.0, 1.5                   |
|                                                          | 1T~48T       | 0.75, 1.0, 1.5                   |

## Application/Limitation

This cable is fire resistant according to IEC 60331.

The requirements 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

| Standard              | Release | General description                                                                                                                                                                                                                                                         | Limitation                                               |
|-----------------------|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| IEC 60092-376         | 2017    | Cables for control and instrumentation circuits 150/250V(300V)                                                                                                                                                                                                              |                                                          |
| IEC 60092-360         | 2021    | Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation, telecommunication cables                                                                                                                                              |                                                          |
| IEC 60331-1/-2        | 2018    | Fire resistance / Circuit integrity – Test method for fire <i>with shock</i> at temperature of at least 830°C for cables rated up to and including 0,6/1 kV                                                                                                                 | @830°C(120min) with shock                                |
| IEC 60331-21          | 1999    | Tests for electric cables under fire conditions – Circuit integrity – Part 21: Procedures and requirements – Cables of rated voltage up to 0,6/1,0 kV                                                                                                                       | @750°C (90min)                                           |
| IEC 60332-1           | 2015    | Test for vertical flame propagation for a single insulated wire or cable                                                                                                                                                                                                    |                                                          |
| IEC 60332-3-22        | 2018    | Test for vertical flame spread of vertically mounted bunched wires or cables                                                                                                                                                                                                | Cat. A                                                   |
| IEC 60754-1/2         | 2019    | Test on gases evolved during combustion of materials from cables – Determination of the amount of halogen acid gas / Determination of the degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity | Low Halogen<br><0,5%<br>Halogen free<br>≥4,3pH, ≤10μS/mm |
| IEC 61034-1/2         | 2019    | Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements                                                                                                                                                        | Low smoke<br>>60%                                        |
| IEC 60092-350 Annex E | 2020    | Cold bend test and impact test for low temperature behaviour                                                                                                                                                                                                                | Cold bend: -30°C<br>Cold impact: -30°C                   |

## Marking of product

[HIS]-RATING-TYPE-SIZE-LS CABLE-YEAR-LENGTH-STANDARD  
EX) [HIS] 250V EIBI(I/C) 4Px0.75 LS CABLE 2015 XXXM IEC 60332 CAT.A IEC60331-2(120)

### **Periodical assessment**

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval are complied with and that no alterations are made to the product design or choice of materials.

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine tests (RT) and selected type tests (ref. to applicable class programs) checked (if not available these tests shall 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