



Certificate no.:
TAE0000548

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Electric Power Cable

with type designation(s)

FS-SLSXTPOBS, FS-DLSXTPOBS(+G), FS-TLSXTPOBS(+G), FS-FLSXTPOBS(+G), FS-C(OS)LSXTPOBS(+G), FS-TP(OS)(IS)(IS-OS)LSXTPOBS

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

Application:

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

Rated voltage (kV) 0.6/1

Temp. class (°C) 90

Issued at **Busan** on **2025-09-20**

This Certificate is valid until **2030-09-19**.

for **DNV**

DNV local unit: **Gimhae Station**

Approval Engineer: **Eun Jin Lee**

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 USD 300 000.

Product description

Type : FS-SLSXTPOBS, FS-DLSXTPOBS(+G), FS-TLSXTPOBS(+G), FS-FLSXTPOBS(+G), FS-C(OS)LSXTPOBS(+G), FS-TP(OS)(IS)(IS-OS)LSXTPOBS

Construction:

Conductor: Tinned annealed stranded copper
Insulation: Mica tape + LSX (Low smoke, halogen free cross-linked polyolefin)
Individual screen : AL/PS or CU/PS tape with drain wire for '(IS)' type
Overall screen : AL/PS or CU/PS tape with drain wire for '(OS)' type
Filler: Non hygroscopic
Jacket : TPO(Thermoplastic polyolefin)
Armor : Tinned copper wire braid
Outer sheath: TPO(Thermoplastic polyolefin)

Type designation	Number of cores	Size of conductor (AWG/MCM)
FS-SLSXTPOBS	1	6, 2, 1/0, 2/0, 3/0, 313, 444, 535, 646
FS-DLSXTPOBS	2	16, 14, 12, 10, 8, 6, 4, 2
FS-DLSXTPOBS+G	2+G	16, 14, 12, 10, 8, 6, 4, 2, 1, 1/0, 2/0, 3/0, 4/0
FS-TLSXTPOBS+G	3+G	16, 14, 12, 10, 8, 6, 2, 1, 2/0, 3/0, 4/0, 262, 313
FS-FLSXTPOBS+G	4+G	14, 2, 1, 2/0, 4/0, 262
FS-C(OS)LSXTPOBS (+G)	4, 6, 10, 16, 20, 37	16
	7, 12, 24, 37	14
	7, 12, 24, 37	12
	1P	18
FS-TP(OS)LSXTPOBS	1P	18
	1P	16
	1P	14
FS-TP(IS-OS)LSXTPOBS	2P, 4P, 12P	18
	2P, 4P, 12P	16
	2P, 3P	14

Application/Limitation

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

The requirements of SOLAS Amendments 1981 Chapter II-1, Part D, Reg. 45, 5.2 (provision to be taken to limit Fire Propagation along Bundles of Cables or Wires) are fulfilled without any additional measures.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
IEEE1580	2021-08	IEEE Recommended Practice for Marine Cable for Use on Shipboard and Fixed or Floating Facilities	
IEC 60331-1/-2	2018	Tests for electric cables under fire conditions - Circuit integrity - 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 0,6/1,0 kV	@ 830 °C w/shock (120 min.)
IEC 60332-3-22	2018	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
IEEE1202	2023	IEEE Standard for Flame propagation testing of wire and cable	
UL 2556	2021	Wire and Cable Test Methods	Sunlight 720hrs
CSA C22.2 No. 03	2009	5.11 Flexibility at any specified temperature	Cold bend: -40°C
CSA C22.2 No. 03	2009	5.12 Abnormal low temperature – impact	Cold impact: -35°C
NES 711	2013	Determination of the smoke index of the products of combustion from small specimens of materials	< 25

Standard	Release	General description	Limitation
NES 713	2013	Determination of the toxicity index of the products of combustion from small specimens of materials	< 1.5
NEMA WC57	2021	Standard for Control, Thermocouple Extension, and Instrumentation Cables Acid gas equivalent	pH >3.56
IEC 60754-2	2019	Test on gases evolved during combustion of electric cables ; Determination of degree of acidity of gases evolved during the combustion of materials taken from electric cables by measuring pH and conductivity	<0.2%

Marking of product

0.6/1kV – Type designation – Size – LS Cable – Year of manufacture – IEEE1580 – IEC 60331-1/-2(120) – IEC60332-3 CAT-A – Length

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