

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Low Voltage Cable**

with type designation(s)

AS-I Bussystem (Flat Cable) FLI 9Y11Y (Red), AS-I Bussystem (Flat Cable) FLI 9Y11Y (Black), AS-I Bussystem (Flat Cable) FLI 9Y11Y (Yellow)

Issued to

**LEONI Special Cables GmbH
FRIESOYTHE, Germany**

is found to comply with

DNV GL 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 GL.**

Type	Rated voltage (V)	Temp. class (°C)
AS-I Bussystem (Flat Cable) FLI 9Y11Y (Red)	240 AC	70
AS-I Bussystem (Flat Cable) FLI 9Y11Y (Black)	48 DC	70
AS-I Bussystem (Flat Cable) FLI 9Y11Y (Yellow)	32 DC	70

Issued at **Hamburg** on **2017-08-02**This Certificate is valid until **2022-08-01**.for **DNV GL**DNV GL local station: **Leer**Approval Engineer: **Carsten Hunsalz**

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Duy Nam Le
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: FLI 9Y11Y

Conductor: Flexible tinned copper conductor class 6

Insulation: Polypropylene (9Y)

Sheath: Polyurethane (11Y)

Number of cores x conductor cross-section mm ²	Overall dimensions mm
2 x 1,5	4,0 ± 0,2/ 10,0 ± 0,2
2 x 2,5	4,0 ± 0,2/ 10,0 ± 0,2

Application/Limitation

Only to be used in connection with AS-I-bus system equipment.

The guide to use and the laying regulation for the AS-interface line should be observed.

Application category: 2 ; (in AS-I Systems only)

Type Approval documentation

Test report : Leoni test report dated 28.03.2011, 16.05.2011, 06.07.2006, 23.04.2007
Siemens test reports dated 11.09.1996, 12.09.1996,
10.10.1996, 11.10.1996, and 26.09.1996
Data sheet: L45587-M21-B38-EN, L45587-M21-B48-EN, L45587-M21-B198-EN
Specification: AS-I K 01-E 12.09.1996
Guide to use: AS-I AR 01-E 12.09.1996/4e and laying regulation / 05.05.97

Tests carried out

Standard	Release	General description	Limitation
IEC 60227-1	2007-10	Polyvinyl chloride insulated cables of rated voltages up to and including 450/750 V - Part 1: General requirements	
IEC 60228	2004-11	Conductors of insulated cables	
IEC 60332-1-2	2004-07	Tests on electric and optical fibre cables under fire conditions – Part 1-2: Test for vertical flame propagation for a single insulated wire or cable – Procedure for 1 kW pre-mixed flame	
IEC 60754-2	2011-11	Test on gases evolved during combustion of materials from cables - Part 2: Determination of acidity (by pH measurement) and conductivity	Halogen free: pH > 4,3 Conductivity < 10µS/mm
IEC 61034-1/2	2013-07/09	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke

Marking of product

“sequential length in meter” * “ASI-LOGO” LEONI L * Leoni part number * Type designation *
“internal order number”

Example:

Job Id: **262.1-025920-1**
Certificate No: **TAE000025U**

00020m * "ASI-LOGO" LEONI L * L45587-M21-B38-EN * FLI-9Y11Y 2x1.5 VZN FRNC * 130180

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) checked (if not available tests according to 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