

TYPE APPROVAL CERTIFICATE

This is to certify:

That the **Low Voltage Cable**

with type designation(s)

MARINE BICC - Halogen free EPR insulated FR+Water LSZH SHF1 or SHF2 or SHF2 MUD 250V

Issued to

Ducab

Dubai, United Arab Emirates

is found to comply with

DNV rules for classification – Ships, offshore units, and high speed and light craft

Application :

Control and Instrumentation.

Fire resistant + Water. Flame retardant in bunch Cat. A. Halogen free. Low smoke.

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Rated voltage (V) 150/250

Temp. class (°C) 90

Issued at **Høvik** on **2023-01-14**

This Certificate is valid until **2028-01-13**.

DNV local station: **Dubai**

for **DNV**

Approval Engineer: **Ivar Bull**

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Frederik Tore Elter
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.



Manufacturing place

Ducab Jebel Ali
Dubai
UAE

Product description

Type: MARINE BICC - Halogen free EPR insulated FR+ Water LSZH SHF1 or SHF2 or SHF2 MUD 250V

Construction:

Conductor:	Plain or tinned copper Class 2 or Class 5
Insulation:	Mica tape + EPR
Inner covering:	Lapped or extruded
Individual screen (if any)*:	Aluminium/polyester tape with tinned copper drain wire (IS type)
Collective screen (if any)*:	Aluminium/polyester tape with tinned copper drain wire (OS type)
Outer sheath:	SHF1 (LSZH) or SHF2 or SHF2 MUD

*Either individual or collective screen (or both) shall be provided.

No of cores:	Cross sectional area [mm ²]
8, 16, 20, 24 pairs	0,75
1, 2, 4, 7, 10, 14, 19, 27, 37 pairs	0,50 0,75 1 1,5 2,5
1, 2, 4, 7 Triples	0,50 0,75 1 1,5 2,5
1, 3, 7 Quads	0,50 0,75 1 1,5 2,5

Application/Limitation

This cable type is fire resistant according to IEC 60331.

The requirements of SOLAS Amendments 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

	Release	General description	Limitation
DNV-CP-0399	2021-08	Class Programme Electric cables	
IEC 60092-350	2020-01	General construction and test methods of power, control and instrumentation cables for shipboard and offshore applications	
IEC 60092-360	2021-01	Electrical installations in ships - Part 360: Insulating and sheathing materials for shipboard and offshore units, power, control, instrumentation and telecommunication cables.	
IEC 60092-376	2017-05	Electrical installations in ships - Part 376: Cables for control and instrumentation circuits 150/250 V (300 V)	
IEC 60331-21	1999-04	Fire resistance / Circuit integrity – Test for electric cables under fire conditions-Circuit integrity – Part 21	
IEC 60331-1	2018-03	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 and with an overall diameter exceeding 20 mm	Minimum 120 min+15 min cooling down time
IEC 60332-3-22	2018-07	Tests on electric and optical fibre cables under fire conditions – Part 3-22: Test for vertical	Charred portion of sample does not exceed 2,5m

	Release	General description	Limitation
		flame spread of vertically-mounted bunched wires or cables – Category A	above bottom edge of burner.
IEC 60754-1	2019-11	Test on gases evolved during combustion of materials from cables - Part 1: Determination of the halogen acid gas content	Low Halogen: <0,5% Halogen
IEC 60754-2	2019-11	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	2019-11	Measurement of smoke density of cables burning under defined conditions – Test apparatus, procedure and requirements	Low smoke Light transmittance ≥60%
NEK TS606 Ed6	2022-03	Cables for offshore installations - halogen-free low smoke flame-retardant / fire-resistant (HFFR-LS). Technical specification.	Mud resistance test: IRM903 100°C 7d. Calcium Bromide 70°C 56d. EDC 95/11 70°C 56d
EN50200	2016-01	Method of test for resistance to fire of unprotected small cables for use in emergency circuits. Annex E: Guidance for using optional water spray protocol.	Cable OD<20mm Water spray applied during last 15 minutes of test. No short circuit or earth fault.
BS 8491 PENDING	2008	Method for assessment of fire integrity of large diameter power cables for use as components for smoke and heat control systems and certain other active fire safety systems	Cable OD>20mm 5 water jets each 10 seconds duration last 5 minutes of test. No short circuit or earth fault.

Marking of product

DUCAB (A) – MARINE BICC – EPR/SHF1 - No of conductors x size - 250 V –IEC 60331-1/2 (120min) + Water spray
EN50200 – 60331-21- IEC 60332-3-22 – Year of manufacture

A = Ducab Jebel Ali, Dubai

B = Ducab M1, Abu Dhabi

C = Ducab M2, Abu Dhabi

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