Certificate no.:
TAE00004Y9

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Flexible cable

with type designation(s)
Hysin Marine Spiral Cable fire resistant

issued to
Wuhan Hysin Ship Technology Co., Ltd.
Wuhan, **China**

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

Flexible spiral cable for moving applications 300/500V
Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2024-11-06**
This Certificate is valid until **2029-11-05**.
DNV local unit: **Nanjing NB & CMC**

for **DNV**

Approval Engineer: **Carsten Hunsalz**

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

Hysin Marine Spiral Cable fire resistant 2X1.5 mm^2 NSC / 3X1.5 mm^2 NSC / 4X1.5 mm^2 NSC
Flexible spiral cable for moving applications 300/500V

Construction:

Conductors:	Bare or tinned copper Class 5
Core insulation:	Mica Tape + TPE
Fillers (Optional):	Cotton yarn
Inner covering:	Plastic tape
Shielding:	Tinned fine copper braid, coverage 90%
Sheath:	PUR

Dynamic properties:

Maximum speed tested	0,33 [m/s]
Number of cycles at Temperature +23°C. Maximum elongation is 6 times of the static length of spiral cable	10000 cycles
Maximum acceleration	0,22 [m/s^2]
Acceptance criteria dynamic tests: Increased resistance of conductor	Maximum 3% increase referred to start of test.
Suitable for torsion (Yes/No)	No

Application/Limitation

Flexible spiral cable for moving applications 300/500V

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

Dynamic tests performed at +23°C. The cables are not to be used on open deck or cold or hot places.

Manufacturers installation instructions to be followed.
Cable must be installed in that way, to avoid cable damage due to movement or external impact.
All conductor ends shall be provided with suitable pressured sockets or ferrules, or cable lugs.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
DNV-CP-0417	2021-08	DNV Class Programme. Flexible electric cables	Dynamic tests performed at +23°C Not to be used on open deck or cold or hot places.
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.	partly
EN 50363-10-2	2005-11	Insulating, sheathing and covering materials for low voltage energy cables Part 10-2: Miscellaneous sheathing compounds – Thermoplastic polyurethane	partly
IEC 60228	2023-12	Conductors of insulated cables	
IEC 60332-1-2	2015-07	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 60331-2	2018-03	Tests for electric cables under fire conditions - Circuit integrity - Part 2: Test method for fire with shock at a	For cables with an overall diameter not exceeding 20 mm

		temperature of at least 830 °C for cables of rated voltage up to and including 0,6/1,0 kV	120 minutes fire test

Marking of product

Example:

Hysin Marine Spiral Cable fire resistant 300/500V 2X1.5 mm^2 NSC IEC 60331-2 <meter marking> <batch no.>

Place of Production

DNV id: 10742847

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