



Certificate no.:
TAE000050N

TYPE APPROVAL CERTIFICATE

This is to certify:
that the Flexible cable

with type designation(s)
Flexible power cable with double PUR sheaths. CEU83-VFD

issued to
Zhongtian Technology Industrial Wire & Cable System Co.,Ltd.
Nantong, China

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

Application:

General power and lighting. PUR sheathed flexible VFD cables.
Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2025-04-03**

This Certificate is valid until **2030-04-02**.

for **DNV**

DNV local unit: **Shanghai**

Approval Engineer: **Ivar Bull**

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

Flexible power cable with double PUR sheaths CEU83-VFD

Conductors:	Stranded copper class 5
Insulation:	EPR
Inner sheath:	TPU
VFD screen	Cu/PS tape
Aarmor:	Bare or Tinned copper wire braid or copper alloy wire braid
Outer sheath:	TPU

CEU83-VFD 0,6/1kV:

No of cores:	Cross sectional area [mm ²]
1, 3	1 – 400
3 + 3E	2,5 – 400 / 1-70

CEU83-VFD 1,8/3kV:

No of cores:	Cross sectional area [mm ²]
1, 3	10 – 400
3 + 3E	10 – 400 / 4-70

Application/Limitation

In enclosed and semi-enclosed spaces, cable runs not complying with flame retardant properties according to IEC 60332-3, shall be provided with fire stops having at least B-0 penetrations:

- at every second deck or approximately 6 metres for vertical runs
- at every 14 metres for horizontal.

Bending test 8D: Up to 300 0000 cycles @ 20°C

Not to be installed on open deck.

Type Approval documentation

Tests carried out

Standard	Release	General description	Limitation
DNV CP-0399	2021-08	Electric cables	Design.
DNV CP-0417	2021-08	Flexible electric cables	Dynamic testing.
IEC 60092-350	2020-01	Electrical installations in ships - Part 350: 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 60092-353	2024-06	Electrical installations in ships - Part 353: Power cables for rated voltages 1 kV and 3 kV	
IEC 60332-1-2	2015-07	Tests on electric and optical fibre cables under fire conditions –	Flame retardant small scale. Distance between the lower edge of the top support and the onset of charring > 50 mm and charring not to extend downwards > 540 mm from the lower edge of the top support.
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

Standard	Release	General description	Limitation
IEC 61034-1/2	2019-11	Measurement of smoke density of cables burning under defined conditions – Part 1: Test apparatus Part 2: Test procedure and requirements	Low smoke Light transmittance >60%
IEC 60684-2	2011-08	Flexible insulating sleeving – Part 2: Methods of test Clause 45.1 Methods of determination of low levels of chlorine, and/or Bromine and/or iodine Clause 45.2 Methods of determination of low levels of fluorine	HCl + HBr + HJ max 0,5% [0,014% can be detected] HF max 0,1% [0,02% can be detected]
IEEE Std 1580:2021	2021	IEEE Recommended Practice for Marine Cable for Use on Shipboard and Fixed or Floating Facilities	Item 5.18.11.2.3 EMI shielding
EN 50363-10-2	2005	Insulation, sheathing and covering materials for low voltage energy cables Part 10-2: Miscellaneous sheathing compounds - Thermoplastic polyurethane	
Manufacturer internal procedure Q/320691 GDA64	2021	Simulated bending test at 8D Travel length 2m with speed 0,5m/s.	Dynamic test is performed only on 0,6/1kV cable. 300 000 cycles in <i>room temperature</i> . No change in conductor resistance. Mechanical properties of insulation and sheaths OK. HV test 5 min 3,5kV OK.
MOD: Defence Standard 07-247	2020-04	Toxicity test	Toxicity Index = 3,45. DefStan requires TI less than 5.

Marking of product

ZTT CEU83-VFD – size – 0,6/1kV or 1,8/3kV – IEC – 60332-1-2 – EN 50363-10-2 - Lot No. - meter marking

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