

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Electric Heating Cable**

with type designation(s)
TSRU, TSRU

issued to

MICC Ltd
Washington, Tyne and Wear, United Kingdom

is found to comply with

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

Application:

Self regulating heating cable with power output depending on temperature.

Suitable for gas dangerous areas ref. IEC Ex marking on cable.

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

Type	Rated voltage (V)	Temp. class (°C)	Power [W/m] @ref. temp.	Suitable for Hazardous areas
TSRU	0-277	200°C (T3)	15/30/45/60 @ 10C	Yes
TSRU	0-277	300°C (T2)	75/90 @ 10C	Yes

Issued at **Høvik** on **2024-08-23**

This Certificate is valid until **2029-08-22**.

for **DNV**

DNV local unit: **UK & Ireland CMC & VMC**

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 300,000 USD.



Product description

TSRU

Conductors:	2 parallel bus wires: Stranded metallic conductor
Heating Conductor Element:	Semi-conductive self-limiting matrix
Insulation:	Fluoropolymer insulation
Braid:	Aluminum sheath or metallic braid
Sheath:	Optional additional outer jacket of MFA/PFA/Silicone

Type designation	Supply voltage (V)	Nominal Output at 10°C (w/m)	Type Self-regulating / Constant power / series
15 TSRU	110-277	15	Self-regulating
30 TSRU	110-277	30	Self-regulating
45 TSRU	110-277	45	Self-regulating
60 TSRU	110-277	60	Self-regulating
75 TSRU	110-277	75	Self-regulating
90 TSRU	110-277	90	Self-regulating

Maximum continuous exposure temperature (Power ON or OFF) is 250°C

Manufactured by

DNV Id: 119908

Application/Limitation

References to Ex-certifications in this type approval is for information only.

Installation has to be done according to installation instruction.

The minimum installation temperature of the heating cables is -40°C

Type Approval documentation

Tests carried out

Tested in accordance with IEC 60079-30-1 Electrical resistance trace heating - General and testing requirements.

Marking of product

MICC Ltd -TSRU – Gas Marking - Power output at nominal voltage – serial number

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