Certificate No:
TAK000021W

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Composite Repair Systems

with type designation(s)
Technowrap SRS with Technowrap LT (Low Temperature),
Technowrap SRS with Technowrap HA (High Ambient),
Technowrap SRS with Technowrap HT (High Temperature)

Issued to
ICR Integrity Limited
Aberdeen, **United Kingdom**

is found to comply with
ISO 24817:2017 "Petroleum, petrochemical and natural gas industries – Composite repairs for pipework – Qualification and design, installation, testing and inspection"

Application :

Composite repair of all geometries of pipe work and structural members including tanks, vessels and decks with various defect sizes and operating conditions. Three different resin types are available depending on the design conditions of the application and repair conditions.

Issued at **Høvik** on **2021-06-24**
This Certificate is valid until **2026-06-23** .
DNV local unit: **Aberdeen**

Approval Engineer: **Gisle Hersvik**

for **DNV**

Gustav Heiberg
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.

Product description

Technowrap SRS: a two-component epoxy resin system with a carbon fibre reinforcement

The fibre reinforcement is:

— Quadri-axial stitched carbon fibre fabric (0°/+45°/-45°/90°).

Technowrap SRS is available in three resin types:

— **LT**: Low Temperature
– aimed at North Sea conditions where application temperatures range from 5°C (41°F) to 25°C (77°F)
— **HA**: High Ambient
– aimed at warmer climates, such as the Middle East, America, and Australia, where application temperatures range from 20°C (68°F) to 50°C (122°F)
— **HT**: High Temperature
– where high service temperatures up to 230°C (446°F) are to be designed for.

Application/Limitation

This Type Approval certificate is not valid for designs, components, equipment, systems or products which are subject to classification by DNV.

— Composite repair of all geometries of pipe work and structural members including tanks, vessels and decks with various defect sizes and operating conditions. Three different resin types (LT, HA, HT) are available depending on the design conditions of the application and repair conditions.
— Surface preparation of substrates to be according to the ICR's *Technowrap™ Master Installation Procedure*.
— For specific substrates the manufacturer must be consulted.
— The repair must be applied in accordance with the ICR's *Technowrap™ Master Installation Procedure*, using qualified, competent installers.

Design calculations to be performed as per ISO 24817:2015, or as later amended.

Any significant changes in design and / or quality of the material will render the approval invalid.

Type Approval documentation

Tests carried out

Testing has been carried out in accordance with ISO 24817:2017 and ASME PPC2 Article 401.

Results from testing and material properties are available in ICR's *Technical Specification Structural LT HA HT*.

Marking of product

Product/package to be marked with manufacturer's name, **ICR Integrity Limited, UK** and in accordance with above *type designation/product name*, and *storage conditions*.

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV Type Approval Certificate.

Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in https://approvalfinder.dnvgl.com

END OF CERTIFICATE