Certificate no.:
TAF00001TA

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Jet Fire Protection

with type designation(s)
ArmaGel HTF

issued to
Armacell GmbH
Münster, Nordrhein-Westfalen, Germany

is found to comply with
DNV offshore standards

Application:

Approved for use as jet fire protection of steel pipes.

Issued at **Høvik** on **2024-05-16**
This Certificate is valid until **2029-05-15**.
DNV local unit: **Essen**

for **DNV**

Approval Engineer: **Tessa Biever**

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.

Product description

"ArmaGel HTF",
A steel pipe, Ø219.1 mm (OD) with 6.3 mm wall thickness (Hp/A 163 m^{-1}), insulated with five layers of each 10 mm thick insulation layers (aerogel blanket) of type 'ArmaGel HTF' (with density 176 kg/m^3, manufactured by Armacell). These layers maintained into position by an outer stainless-steel jacketing, fastening bands and stainless-steel buckles (see details below).

Installation details:
- Consecutive ArmaGel HTF layers shall have ≥ 200mm staggering on the circumferential butt-joints.
- ≥ 100 mm circumferential overlapping on the longitudinal joints of ArmaGel HTF on every layer
- Fixing of ArmaGel HTF layers with stainless steel wires (diameter of 0.8 mm), spaced at ≤ 200 mm, expect for the penultimate layer
- Fixing of the penultimate ArmaGel HTF layer with alternating stainless steel wires and bands, spaced at ≤ 200 mm. Stainless steel bands of 16 mm and thickness of 0.75 mm, tightened by stainless steel buckles. Stainless steel wires (diameter of 0.8 mm).
- Outer stainless steel jacketing system with a longitudinal overlap of ≥ 250 mm and with circumferential overlap ≥ 200 mm, fixed with 4.8 mm stainless steel rivets (≥ 6 rivets per m).
- Fixing of stainless steel jacketing with stainless steel bands of 16 mm and thickness of 0,75 mm, tightened by stainless steel buckles, spaced at ≤ 200 mm. Securing of the bands with two 4.8 mm stainless steel rivets, at a distance of 80 to 100 mm left and right of the stainless steel buckle.

For further details see drawing mentioned under Type Approval documentation.

The product may be manufactured at the following location:
- Armacell Jios Aerogels Corp (AJA), 106, 5sandan 1-ro, Seongnam-Myeon, Dongnam-gu, Cheonan-si, Chungcheongnam-do, South-Korea.

Application/Limitation

Approved for use as jet fire protection of steel pipes.

Rating: (Type of fire / Type of application / Critical temperature rise (°C) / Period of resistance (minutes)):

Any project specific design solutions arrived at on basis of this certificate are to be further validated by project specific approvals carried out by the appointed verifying authority for each project in each case at the detail engineering stage.

The approval refers only to the fire resistance properties of the system.

Each product is to be supplied with its manual for application and maintenance.

Type Approval documentation

Certification in accordance with Class Programme DNV-CP-0338, September 2021.

Test report No. EFR-22-004448 dated 10 May 2023 from EFECTIS France, Les Nappes, France.

Drawing No. 01 ~ 03 dated February 2023 from manufacturer.

Tests carried out

Tested according to ISO 22899-1:2021.

Marking of product

The product or packing is to be marked with name of manufacturer, type designation and fire technical rating.

Periodical assessment

DNV's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in DNV-CP-0338 Section 4.