



Marine & Offshore

Certificate number: 08764/D0 BV

File number: ACM 135/0617/001

Product code: 2102I

*This certificate is not valid when presented without the full attached schedule composed of 7 sections*

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## TYPE APPROVAL CERTIFICATE

*This certificate is issued to*

**Frenzelit GmbH**

Bad Berneck - GERMANY

*for the type of product*

**NON-METALLIC EXPANSION JOINTS / BELLOWS**

FRENZELIT NON-METALLIC EXPANSION JOINTS

**Requirements:**

BUREAU VERITAS Rules for the Classification of Steel Ships

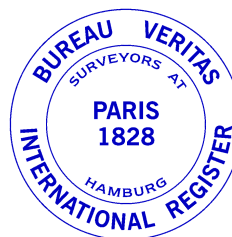
*This certificate is issued to attest that Bureau Veritas Marine & Offshore did undertake the relevant approval procedures for the product identified above which was found to comply with the relevant requirements mentioned above.*

**This certificate will expire on: 12 Jan 2023**

**For Bureau Veritas Marine & Offshore,**

At BV HAMBURG, on 12 Jan 2018,

Adama Diene



This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site [www.veristar.com](http://www.veristar.com). Any Person not a party to the contract pursuant to which this document is delivered may not assert a claim against Bureau Veritas Marine & Offshore for any liability arising out of errors or omissions which may be contained in said document, or for errors of judgement, fault or negligence committed by personnel of the Society or of its Agents in establishment or issuance of this document, and in connection with any activities for which it may provide.

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BV Mod. Ad.E 530 June 2017

This certificate consists of 3 page(s)

## THE SCHEDULE OF APPROVAL

### 1. PRODUCT DESCRIPTION

#### **Frenzelit non-metallic expansion joints**

##### 1.1 Description:

Circular or rectangular expansion joints.

Depending on the application (mostly of the temperature range and mechanical stress), the expansion joints are a multi-layered composition of different materials.

##### 1.2 Technical characteristics:

Temperature range of media	-40°C up to 570°C
Maximum pressure in service: depends on the joint according to manufacturer's specification	40 mbar
Maximum vacuum in service: depends on the joint according to manufacturer's specification	100 mbar
Axial reduction/increase: depends on the joint according to manufacturer's specification	-50 mm/+50 mm
Lateral displacement: depends on the joint according to manufacturer's specification	50 mm

##### 1.3 Material specification:

The materials of the layers in accordance with the manufacturer's specifications depending on the application are the following:

- isoTHERM 800
- isoGLAS fabric / special fabric coated or not with silicone or PTFE or EPDM
- PTFE film
- Silicone film
- Rockwool
- Ceramic wool
- Stainless steel wire mesh.

### 2. DOCUMENTS AND DRAWINGS

According to the Manufacturer's technical data sheets as follows:

- PTFE - film 0.2 material N° 2386600200
- GLASTEX 750 material N° 2386635430
- isoGLAS - woven fabric with PTFE impregnation material N° 2382116002
- isoGLAS - woven fabric material N° 2382190000
- isoTHERM 800 - woven fabric V4A reinforced material N° 2383410020
- isoGLAS - needlemat material N° 3766180612
- Silicon - film 1.5 mm red material N° 2386400515
- isoGLAS - woven fabric one face silicon material N° 2382514001
- Stainless steel wire mesh material N° 2383920015
- Stainless steel wire mesh material N° 2383920030

### 3. TEST REPORTS

The expansion joints are designed and tested according to RAL expansion joints quality insurance RAL-GZ719: thermostability test, chemical resistance test, mechanical test, tightness test, fatigue strength test under cyclic bedding stresses

Other tests:

Leakage test, bursting strength test, vacuum test; fire test (on Rockwool, Ceramic wool, isoGLAS and isoTHERM):

### 4. APPLICATION / LIMITATION

4.1 The expansion joints may be used on the following circuits:

- Exhaust lines of gas turbines and internal combustion engines
- Air inlet lines of gas turbines and internal combustion engines
- Ventilation and aeration lines

4.2 The expansion joints are not to be used where they impair the fire and/or the watertight integrity of the space concerned.

- 4.3 On board installation and maintenance requirements have to be in accordance with the Society's Rules requirements and the manufacturer's recommendations.

## **5. PRODUCTION SURVEY REQUIREMENTS**

- 5.1 The expansion joints are to be supplied by the manufacturer in compliance with the type and requirements described in this certificate.
- 5.2 This type of product is within the category IBV of BUREAU VERITAS Rule Note NR320.
- 5.3 BUREAU VERITAS product certificate is required.
- 5.4 Arrangements shall be made for a Society's Surveyor to attend the tests and examinations at manufacturer's works or to perform the relevant audits when an alternative survey scheme, BV Mode I, has been arranged, in order to issue the BUREAU VERITAS certificate for the units to be fitted on board ships classed with BUREAU VERITAS.
- 5.5 **Frenzelit GmbH** has declared to BUREAU VERITAS that the products detailed in this certificate are manufactured at the production site stated on the front page of this certificate.
- 5.6 Each expansion joint with ends is to be hydraulically pressure tested to twice the maximum working pressure under witnessing of a Society's Surveyor.

## **6. MARKING OF PRODUCT**

Each expansion joint is to be clearly marked to avoid any wrong utilization with at least:

- Manufacturer's name or logo
- Type designation
- Date of manufacture
- Nominal diameter
- Maximum working pressure
- BUREAU VERITAS' marks

## **7. OTHERS**

- 7.1 This approval is given on the understanding that the Society reserves the right to require check tests to be carried out on the units at any time and that **Frenzelit GmbH, Bad Berneck / GERMANY** will accept full responsibility for informing shipbuilders, ship owners or their subcontractors of the proper methods of use and general maintenance of the units and the conditions of this approval.
- 7.2 This certificate supersedes the Type Approval Certificate N° 08764/C0 BV issued on 08 Feb 2013 by the Society.

\*\*\* END OF CERTIFICATE \*\*\*