DNV·GL

TYPE APPROVAL CERTIFICATE

Certificate No:
TAM0000028
Revision No:
1

This is to certify:

That the Pourable Compound for Foundation Chocking

with type designation(s)
Belzona® 7111

Issued to
Belzona Inc.
MIAMI FL, United States

is found to comply with
Det Norske Veritas' Rules for Classification of Ships/High Speed and Light Craft
TYPE APPROVAL OF POURABLE COMPOUNDS FOR FOUNDATION CHOCKING, (DRAFT 2001)

Application :

The approval is valid for foundation chocking of diesel engines, reduction gears, thrust bearings, rudder actuators, stern tubes and other auxiliary machinery.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **2019-09-16**.
Issued at **Høvik** on **2015-09-25**

DNV GL local station: **Miami**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

Digitally Signed By: Strande, Martin
Location: DNV GL Høvik, Norway
Signing Date: 2015-10-08

Martin Strande
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.

Job Id: **262.1-020219-1**
Certificate No: **TAM0000028**
Revision No: **1**

Product description

Belzona® 7111; Two-component epoxy-based pourable compound for foundation chocking,

Application/Limitation

The approval is valid for foundation chocking of diesel engines, reduction gears, thrust bearings, rudder actuators, stern tubes and other auxiliary machinery.

For max. service temperatures the max. loading limit is as following:

Max. Service Temperature [°C]	80
Max. Total Surface Pressure [N/mm^2]	4.5

For lower service temperatures the max. loading limits are to be in accordance with Manufacturer's recommendations.

Surface pressure exerted on Cast Resin chocks caused by dead weight of machinery: max. 0.7 N/mm². In exceptional cases a surface pressure caused by dead weight of machinery is permitted up to 0.9 N/mm² (e.g. low speed Two-Stroke-Engines)

A chocking plan with bolt stress calculations to be submitted for approval in each particular case.

The tightening-up of engine and reduction gear holding-down bolts, controlled at installation, is to be checked after trial trip when cooled down. Information about this is to be given at the delivery of the compound.

The manufacturer's instructions to casting and curing of the compound are to be followed.

After hardening of the chocks and prior to tightening of the holding-down bolts a Barcol hardness test has to be performed with a result of at least 40 (ref. Belzona 7111 IFU).

The approval is also valid for offshore use with reference to DNV Offshore Service Specification DNV-OSS-101 Rules for Classification of Offshore Drilling and Support Units.

Type Approval documentation

1. Email from Belzona Inc. of 2015-09-25.
2. Email from Belzona Inc. of 2015-08-18, including:
   - Company Brochure; "Maintaining Asset Integrity in the Marine Industry" (02/2015)
   - 7111 Marine Grade "Superior Pourable Chocking, Backing and Leveling Compound" (Product Flyer, PF) (07/2014)
   - MSDS, Belzona® 7111 Base (epoxy resin) (05/2014)
   - MSDS, Belzona® 7111 Solidifier (amine curing agent) (05/2014)
   - Product Specification Sheet (PSS), Belzona 7111, FN10160 (05-01-14-03)
   - Belzona 7111 Instructions for Use (IFU), FN10160 (04-02-14-03)
   - GSS-12; Belzona Know-How "For Shimming and Leveling General Equipment" (09/2014)
   - EXOVA Test Certificate No. O408750 (Issue 3) of 2015-01-02.
   - EXOVA Report No. 341256A of 2014-12-22.
   - R-Tech Test Report No. C14016 of 2015-03-17.
   - Approvals by ABS, LR and RINA.
3. Application for Type Approval of 2015-06-04,
4. Assessment Report from DNV GL Miami of 2015-09-17,
5. Various correspondences between Belzona Inc. and DNV GL, August 2014 - August 2015.

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**.

Marking of product

The product/package to be marked with *manufacturer's name* and/or *trademark*, *place of production* and *type number identification*.

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 GL 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 Assessment to be performed after two (2) years (Certificate Retention) and at renewal after four (4) years (Certificate Renewal).

The main elements of the Periodical Assessment are to:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV GL Type Approval Certificate.

END OF CERTIFICATE