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# DET NORSKE VERITAS

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## TYPE APPROVAL CERTIFICATE

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CERTIFICATE NO. **K-5902**

This is to certify that the  
**Sandwich Core Materials**

with type designation(s)  
**Gurit® Corecell™ T-Foam; T400, T500, T550, T600 and T800**

Issued to  
**Gurit Americas Inc.**  
**MAGOG, QUÉBEC, Canada**

is found to comply with  
**Det Norske Veritas' Rules for Classification of High Speed, Light Craft and Naval Surface Craft**  
**Det Norske Veritas' Type Approval Programme 1-501.10, 2009, Sandwich Core Materials**  
**Det Norske Veritas Standards' for Certification No. 2.21, Craft, 2010**  
**Det Norske Veritas' Standards for Certification No. 2.20, Lifeboats and Rescue Boats, 2007**

Application  
**Core material for sandwich construction.**  
**Area of application will be evaluated during approval of classified objects.**

This Certificate is valid until **2017-12-31**.

Issued at **Høvik** on **2014-03-28**

DNV local station: **Montreal**

Approval Engineer: **Gisle Hersvik**

for **Det Norske Veritas AS**

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**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.  
If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

## Product description

**Gurit® Corecell™ Structural T-Foam; T400, T500, T550, T600 and T800;** SAN (styrene-acrylonitrile) core material for sandwich constructions.

The following manufacturer's specified values are confirmed by type testing:

Properties	Test Method	T400	T500	T550	T600	T800	Unit
Density (Nominal)	ASTM D1622	71	94	104	115	143	kg/m <sup>3</sup> msv
Density	ASTM D1622	66	89	100	108	133	kg/m <sup>3</sup> msmv
Tensile strength	ASTM D1623	1,30	1,72	1,91	2,11	2,62	MPa msv
Tensile strength	ASTM D1623	0,97	1,30	1,47	1,58	1,95	MPa msmv
Tensile modulus	ASTM D1623	85	118	134	151	196	MPa msv
Compressive strength	ASTM D1621-04	0,88	1,41	1,67	1,98	2,85	MPa msv
Compressive strength	ASTM D1621-04	0,62	1,19	1,45	1,65	2,34	MPa msmv
Compressive modulus	ASTM D1621-04	45	69	79	90	119	MPa msv
Compressive modulus	ASTM D1621-04	35	58	70	78	103	MPa msmv
Compressive modulus	ASTM D1621-73	62	101	120	143	209	MPa msv
Compressive modulus	ASTM D1621-73	42	58	71	81	116	MPa msmv
Shear strength	ASTM C273	0,81	1,15	1,30	1,47	1,93	MPa msv
Shear strength	ASTM C273	0,51	1,01	1,17	1,29	1,67	MPa msmv
Shear modulus	ASTM C273	28	40	46	52	70	MPa msv
Shear modulus	ASTM C273	17	35	41	45	60	MPa msmv
Shear elongation, at break	ASTM C273	24	17	15	13	10	% msv
Heat resistance, % retention of shear strength, +50°C	ASTM C393	-	-	-	-	80,0	%
Water resistance, % retention of shear strength	ASTM C393	-	-	-	-	>100	%

### Legends:

msmv = Manufacturer's Specified Minimum Value

msv = Manufacturer's Specified Value (average values at average densities)

## Manufactured by

**Gurit Americas Inc.**, 555 Blv Poirier, Magog, Quebec J1X7L1, Canada

DNV local station: Montreal

**Gurit (Tianjin) Composite Materials Co., Ltd.**, No. 1 Hengtong Road, YSP, TEDA, Tianjin, P.R. China.

DNV local office: Dalian

## Responsibility

The Company (stated on the front page of this Certificate) takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

## Type Approval documentation

1. Assessment Report from DNV Montreal of 2014-03-10.
2. Test Results of 2014-02-27, 2014-03-05 and Calibration Certificates.
3. Application for Type Approval of 2013-10-18.

## Tests carried out

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

## Marking of product

Product shall be marked with *manufacturer's name*; **Gurit**, *place of production*, and *type designation*.

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 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 Type Approval Certificate.

END OF CERTIFICATE