

# TYPE APPROVAL CERTIFICATE

**This is to certify:****That the Sandwich Core Materials**

with type designation(s)  
**Kerdyn® Green - Series**

Issued to

**Gurit Italy S.r.l.**  
**Volpiano (TO), Italy**

is found to comply with  
**DNV GL class programme DNVGL-CP-0084 – Type approval – Sandwich core materials**

**Application :**

**Manufacturing of sandwich-structured composite.**

Issued at **Hamburg** on **2018-02-15**

This Certificate is valid until **2023-02-14**.

DNV GL local station: **Hamburg Materials & Welding**

for **DNV GL**

Approval Engineer: **Guido Michalek**

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**Thorsten Lohmann**  
**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.



## Product description

Closed-cell and recycled Polyethylene Terephthalate (PET) Foam.

## Approved variants

- Kerdyn® Green 80 - Kerdyn® Green 100 - Kerdyn® Green 115 - Kerdyn® Green 135  
 - Kerdyn® Green 150 - Kerdyn® Green 200 - Kerdyn® Green 250 - Kerdyn® Green 300

## Material Properties

All values are average values (minimum values within brackets) and have been verified by testing.

Variant	Test Method	Kerdyn® Green 80	Kerdyn® Green 100	Kerdyn® Green 115	Kerdyn® Green 135	Kerdyn® Green 150	Kerdyn® Green 200	Kerdyn® Green 250	Kerdyn® Green 300
Nominal Density	(1)	80	100	115	135	150	200	250	300
Density Range	(1)	75 - 85	95 - 105	110 - 120	130 - 140	145 - 155	195 - 205	245 - 255	295 - 305
Compr. Strength	(2)	0.86 (0.50)	1.30 (0.94)	1.65 (1.28)	2.12 (1.75)	2.49 (2.12)	3.79 (3.41)	5.21 (4.81)	6.73 (6.32)
Compr. Modulus	(2)	74.0 (46.0)	91.0 (63.0)	105.0 (77.0)	126.0 (96.0)	142.0 (112.0)	203.0 (173.0)	276.0 (244.0)	360.0 (327.0)
Shear Strength	(3)	0.59 (0.47)	0.80 (0.68)	0.97 (0.84)	1.20 (1.08)	1.40 (1.26)	2.04 (1.52)	2.36 (1.76)	2.66 (1.99)
Shear Strength	(5)	0.58 (0.43)	0.79 (0.64)	0.95 (0.80)	1.17 (1.02)	1.35 (1.19)	1.95 (1.50)	2.31 (1.78)	2.65 (2.06)
Shear Modulus	(4)	18.0 (14.0)	25.0 (21.0)	30.0 (26.0)	37.0 (34.0)	43.0 (39.0)	62.0 (59.0)	83.0 (79.0)	105.0 (101.0)
Shear Modulus	(6)	16.0 (13.0)	23.0 (20.0)	27.0 (24.0)	34.0 (31.0)	39.0 (36.0)	57.0 (54.0)	75.0 (72.0)	93.0 (90.0)
Tensile Strength	(7)	1.54 (0.70)	1.82 (0.99)	2.02 (1.19)	2.27 (1.44)	2.45 (1.63)	2.98 (2.17)	3.42 (2.61)	3.77 (2.96)
Heat Resistance	(8)	-	-	-	-	-	-	-	≤47

(1) Density according to ISO 845 in kg/m<sup>3</sup>.

(2) Compressive properties according to ISO 844:2014, procedure B in MPa.

(3) Shear strength parallel (0°) to welding lines according to ISO 1922 in MPa.

(4) Shear modulus parallel (0°) to welding lines according to ISO 1922 in MPa.

(5) Shear strength perpendicular (90°) to welding lines according to ISO 1922 in MPa.

(6) Shear modulus perpendicular (90°) to welding lines according to ISO 1922 in MPa.

(7) Flatwise tensile test according to ASTM C 297 with specimen made of pure foam in MPa.

(8) Heat resistance according to DNV GL Class Programme CP-0084 in °C with a retention of shear strength ≥80% .

## Limitation

The foam complies with the applicable requirements of DNV GL and is compatible to the laminating resin and/or adhesive. Any significant changes in design and / or quality of the material will render the approval invalid.

## Type Approval documentation

- Technical Data Sheet
- Test Report No.11260 issued by the DNV GL certified testing laboratory of Gurit Americas (DNV GL Approval Number GL-LZ 2312), dated on 2018-01-05.
- Audit Report issued by DNV GL Italy

## Assessed production site

Gurit Italy S.R.L.                      Gurit (Tianjin)

Job Id: **262.1-028296-1**  
Certificate No: **TAK0000155**

Via Torino  
10088 Volpiano  
Italy

No. 1 Hengtong Road  
Yat Sen Park, Wu Qing District, Tianjin  
China 301726

### **Periodical assessment**

A production site with a valid Approval of Manufacturer (AoM) certificate for material in question is exempted from the obligation concerning retention and renewal assessments.  
For manufacturer without a valid AoM a periodical assessment after 2.5 years and at renewal after 5 years is required.

### **Remarks**

ASTM C 273 and ISO 1922 work on the same technical principle and provide comparable test results.

END OF CERTIFICATE