STRUCTREPAIR SHEETS

STR4016-Series

TECHNICAL DATA SHEET

approved according DNV·GL

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Am Dürrbachgraben 1 | 01945 Ruhland | info@structrepair.de | www.structrepair.de | Tel +49 (0) 35752 50 00 10 | Fax +49 (0) 35752 94 09 20

WindGuard Certification GmbH

Oldenburger Straße 65,
26316 Varel, Germany

WINDGUARD Certification

TYPE APPROVAL CERTIFICATE
Prepreg based Repair System
No.: ZT19073-R0

This conformity statement is issued to

Structrepair GmbH
Am Dürrbachgraben 1,
01945 Ruhland
Deutschland

for the material / system:

Rotorblatt Reparatursystem "Structrepair"

The certificate statement attests compliance with:

DNVGL-CP-0431 Type Approval – Non Metallic Materials - Prepreg materials

DNVGL-ST-0376 Rotor Blades for Wind Turbines

IEC 61400-1:2005 + AMD1:2010 -ed3 Wind turbines – Part 1: Design requirements

It is based on the reference documents listed under Type Approval documentation in page 3. of this statement.

Application:

Repair of rotor blades and other FRP-based components in field applications

Changes in the process are to be approved by the WindGuard Certification GmbH. Without approval, this conformity statement loses its validity.

The validity of this conformity statement is not limited in time.

For WindGuard Certification GmbH

Frank Wiese
Head of Certification Body
Varel, Germany 19.05.2020

DAkkS Deutsche Akkreditierungsstelle D-ZE-17195-01-00

WINDGUARD Certification

Certificate issued by WindGuard Certification GmbH, Oldenburger Str. 65, 26316 Varel, Germany, accredited as a certification body by Deutsche Akkreditierungsstelle GmbH (DAkkS) according to DIN EN ISO/IEC 17065:2013. The accreditation applies only for the accreditation scope which is shown in the attachment of certificate DE-ZE17195-01-00. The Deutsche Akkreditierungsstelle GmbH is signatory of the multilateral arrangements of EA, ILAC and IAF in mutual recognition.

Introduction

Structrepair sheet STR4016 is a fast curing epoxy prepreg system, which is solid at room temperature. The sheets can be provided customized with different glass and carbon unidirectional or multi-axial fiber materials.

The prepreg is designed for structural outdoor repairs, which can be performed quickly and without laminating skills. It can be stored at room temperature. Due to the solid resin state, there is no resin contamination of technicians and equipment during processing. The curing cycle lasts between 30 and 45 minutes. Post curing is not necessary.

For processing ***STR4016***, it is recommended to use *structrepair vacuum heating mats* and the *structrepair process unit*. Using this equipment, the curing process is almost independent on the ambient conditions. The repair kit provides heat and vacuum to the repair spot.

STR4016 provide excellent adhesion to epoxy and polyester substrates.

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STR4016-E-BX-430-45

Resin	Material	Textil	Area weight	Fibre orientation in role direction

Resin: STR4016; Material: E-glass; Textil: Biax;
Area weight: 430 g/m²; Orientation: ±45°

Product information

STR4016 is available in carbon and glass fabric, ranging in weight from 200 to 600 g/m². Fiber orientations from UD, biax to triax are available.

The following products are approved according to DNV-GL standards:
Structrepair sheets STR4016 with UD and biaxial oriented glass fiber between 200 and 450 g/m². Fiber volume ratio betwen 25 and 35%. Further products can be approved on demand.

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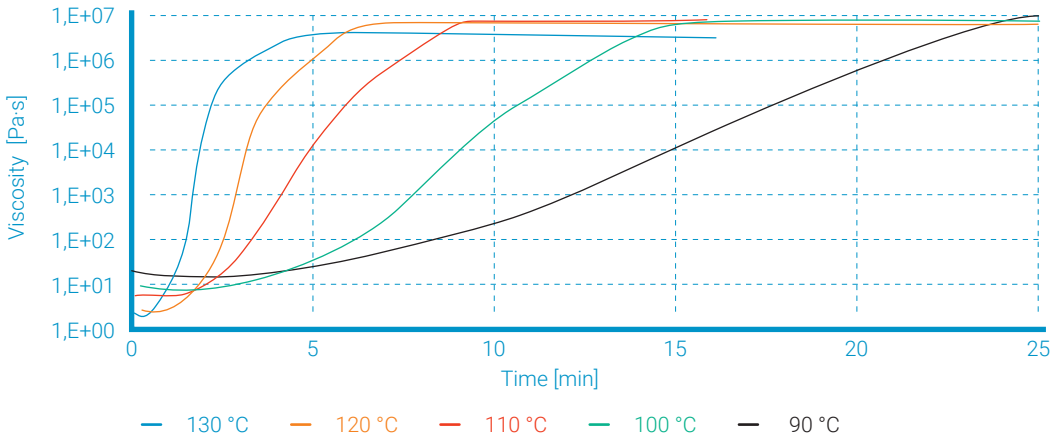
Resin properties

Resin viscosity

Resin viscosity profile at different temperatures (isothermal).



Cured resin properties

Resin properties, fully cured using *structrepair kit* and the recommended curing cycle, without post curing:

	Unit	epoxy resin in structrepair sheets	requirement according DNV-GL	Test Standard
T_g	°C	120	70	ISO 6721-5
E-Modulus	GPa	3,1	2,7	DIN EN ISO 527-2
Tensile Strength	MPa	69	55	DIN EN ISO 527-2
Flexural Strength	MPa	121	105	DIN EN ISO 178
Max. Elongation	%	4,28	2,50	DIN EN ISO 527-2
Resin Density	g/cm³	1,16		DIN EN ISO 1172

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Laminate properties

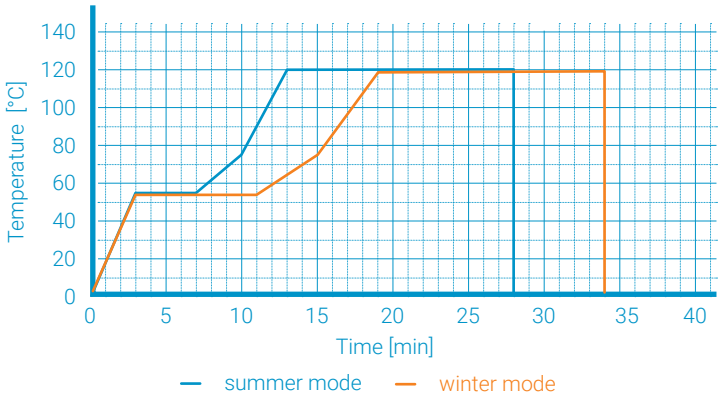
Laminate properties, fully cured using *structrepair kit* and the recommended curing cycle, without post curing. Fiber volume ratio 30%:

Property	Symbol	Unit	Value	Test Standard
0° Tensile Strength, UD*	σ_m	MPa	517,5	DIN EN ISO 527-5A
0° Tensile Modulus, UD*	E_t	GPa	25,3	DIN EN ISO 527-5A
0° Elongation, UD	ε_m	%	2,1	DIN EN ISO 527-5A
+45°/-45° Tensile Strength, Biax*	σ_m	MPa	116,0	DIN EN ISO 527-4
+45°/-45° Tensile Modulus, Biax*	E_t	GPa	7,1	DIN EN ISO 527-4
+45°/-45° Elongation, UD	ε_m	%	9,7	DIN EN ISO 527-4
0° Compressive Strength, UD*	σ_{cm}	MPa	635,7	DIN EN ISO 14126
0° Compressive Modulus, UD*	E_c	GPa	24,4	DIN EN ISO 14126
0° Interlam shear, UD*	τ_{12m}	MPa	61,2	DIN EN ISO 14130

curing cycle specimens - 120 °C for 25 min
*Normalised to 30% fibre volume fraction

Curing cycles

In laboratory conditions, ***STR4016*** cure within 6 minutes at 120 °C. For outdoor applications, we recommend the curing cycles shown below.



Processing only with structrepair process unit and structrepair vacuum heating mat.

Ambient conditions: -10 °C to 60 °C and up to 98 % relative air humidity.

Apply curing cycle winter at ambient temperatures < 8°C.

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Transport & storage

Temperature	Duration	Storage condition
-18°C	24 months	cold storage house
10 -15°C	5 months	temperature controlled transportbox
20°C	90 days	temperature controlled transportbox, etc.
40°C	8 hours	repair site

structrepair sheets must be stored out of direct sunlight.

Health & safety

Please refer to MSDS for up to date information specific to this product.

Packaging

The material is delivered as reel material in widths of 400, 600, 800 and 1000 mm. Maximum reel weight is 30 kg.

Notice

All advice, instruction or recommendation is given in good faith but *structrepair* only warrants that advice in writing is given with reasonable skill and care. No further duty or responsibility is accepted by the company.

Structrepair reserves the right to change specifications and prices without notice. The company is continuously reviewing and updating literature.

Please ensure that you have the current version by contacting us and quoting the revision number in the lower left corner of this page.

Contact

For all queries, please contact us:

Telephone: +49 (0) 35752 50 00 10
Email: support@structrepair.com
Address: Am Dürrbachgraben 1
01945 Ruhland
Germany

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