

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Carbon Fibre Products**

with type designation(s)

Uniaxial; L (0°) (100 – 1200 g/m²) and T (90°) (100 – 1200 g/m²)**with or without F (20 – 50 g/m²)**

Issued to

**Hexcel Reinforcements UK Ltd
Leicester, United Kingdom**

is found to comply with

**DNV GL class programme DNVGL-CP-0434 – Type approval – Uni- and multi-axial multi-ply
fabrics made of carbon fibres****DNV GL rules for classification – High speed and light craft****DNV GL standard DNVGL-ST-0342 – Craft****Det Norske Veritas' Standards for Certification No. 2.20, Lifeboats and Rescue Boats, 2007****Application :****For use in marine vessels according to stated Rules/Standards.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed
by DNV GL.**This Certificate is valid until **2021-11-09**.Issued at **Høvik** on **2016-11-10**DNV GL local station: **Manchester**Approval Engineer: **Gisle Hersvik**for **DNV GL**

**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:
Certificate No: **TAK00000HY**

Product description

Uni-axial Carbon Fibre Products, of 0° and 90° orientation:

- Uni-directional stitched and woven carbon
- L (0°) (100 – 1200 g/m²) and T (90°) (100 – 1200 g/m²) with or without F (20 – 50 g/m²)

Remarks:

L: Longitudinal

T: Transverse

F: Fleece (Micromesh/Veil/Nonwoven)

The following indicative properties have been verified by Type Testing of laminates:

Property	Test Method	FCIM230 / C12K300 (0°)		
Tensile Strength	ISO 527	1130	MPa	mean
Tensile Modulus	ISO 527	108	GPa	mean
Tensile Elongation	ISO 527	-	%	mean
Compressive Strength	ISO 604	115	MPa	mean
Compressive Modulus	ISO 604	33	GPa	mean
Compressive Elongation	ISO 604	-	%	mean
Flexural Strength	ISO 14125	1279	MPa	mean
Flexural Modulus	ISO 14125	81	GPa	mean
Flexural Elongation	ISO 14125	-	-	mean
Fibre content (by weight)	-	56	%	mean
Resins		Scott Bader's Crystic 701 PA Ashland's AROPOL M 105 TBR		
Curing Procedure for Type Testing		24 hrs at ambient temperature, 16 hrs at 40°C		
<i>Legend:</i> mean = Mean of Type Test results				

Application/Limitation

Area of application will be evaluated during approval of classified objects.

Type Approval documentation

Tests carried out

Type Testing carried out according to **Type Approval documentation**.

Marking of product

Product shall be marked with *manufacturer's name*: **Hexcel Reinforcements UK Ltd., Leicester, UK** 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 GL Type Approval Certificate.



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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 2.5 years (Certificate Retention) and at renewal after 5 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