DNV·GL

Certificate No:
TAK00001CJ

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Sandwich Core Materials

with type designation(s)
AIREX T92 - Series

Issued to
Airex AG
Sins, AG, Switzerland

is found to comply with
DNV GL class programme DNVGL-CP-0084 – Type approval – Sandwich core materials
DNV GL rules for classification – High speed and light craft
Det Norske Veritas' Standards for Certification No. 2.20, Lifeboats and Rescue Boats, 2007
Det Norske Veritas Standards' for Certification No. 2.21, Craft, 2010

Application :

Manufacturing of sandwich-structured composites.

Issued at **Hamburg** on **2018-10-04**
This Certificate is valid until **2023-10-03**.
DNV GL local station: **Hamburg Materials & Welding**

Approval Engineer: **Guido Michalek**

for **DNV GL**

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.

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Job Id: **262.1-029899-1**
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Product description

A cross-linked, closed-cell PET (Polyethylene Terephthalate)-foam core material for sandwich constructions.

Approved variants

- AIREX T92.60
- AIREX T92.60 SX
- AIREX T92.80
- AIREX T92.80 SX
- AIREX T92.100
- AIREX T92.100 SX
- AIREX T92.130
- AIREX T92.200
- AIREX T92.320

AIREX T92 products with the suffix SX provides the same mechanical properties with a reduced resin uptake.

Material Properties

	Variant	AIREX T92.60	AIREX T92.80	AIREX T92.100	AIREX T92.130	AIREX T92.200	AIREX T92.320
1	Nominal Density	65	85	100	135	210	320
1	Density Range	60 - 70	80 - 90	95 - 110	127 - 143	200 - 220	310 - 330
2	Compressive Strength	0.80 (0.70)	1.30 (1.10)	1.75 (1.40)	2.40 (2.10)	3.80 (3.20)	7.10 (6.50)
2	Compressive Modulus	50 (35)	75 (60)	90 (65)	140 (110)	180 (150)	280 (240)
3	Shear Strength	0.50 (0.40)	0.72 (0.65)	0.90 (0.75)	1.30 (1.10)	2.00 (1.60)	3.50 (3.00)
4	Shear Modulus	13.0 (--)	22.0 (--)	26.0 (--)	34.0 (--)	55.0 (--)	110.0 (--)
5	Shear Modulus	12.0 (10.5)	19.5 (16.0)	23.0 (19.0)	30.0 (25.0)	50.0 (45.0)	110 (90.0)
6	Shear Elongation	25 (15)	30 (20)	20 (10)	12 (8)	6 (4)	5 (3)
7	Tensile Strength	1.5 (1.3)	1.9 (1.4)	2.3 (1.5)	2.6 (2.0)	3.1 (2.5)	4.5 (4.0)
7	Tensile Modulus	85 (75)	90 (80)	110 (90)	175 (130)	230 (190)	390 (330)
8	HRT	60	60	60	60	60	60
9	Water Resistance	>80					
10	Flatwise tensile strength	(--)	>1.30				

(1) Density according to ISO 845 in kg/m³
(2) Compressive properties according to ISO 844:2014, procedure B in MPa.
(3) Shear strength according to ISO 1922 in MPa.
(4) Shear modulus parallel to the welding lines according to ISO 1922 in MPa.
(5) Shear modulus perpendicular to the welding lines according to ISO 1922 in MPa.
(6) Shear elongation at break according to ISO 1922 in %.
(7) Tensile properties according to ASTM C 297 in MPa.
(8) Heat resistance temperature (HRT) in °C where the shear strength is > 80% of the shear at RT.
(9) Water resistance, percentage retension of shear strength after 28 days at 40°C in salt water acc. to ASTM C393.
(10) Flatwise tensile strength in the laminate (Epoxy) according to ASTM C 297 in Mpa.

All values are average values and verified by testing. The values within brackets are minimum values.

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 issued by Alcan Composites, based on test results witnessed by DNV GL, dated on 2010-03-11.
- Test Report No. AP 15-09 issued by Airex AG, based on test results witnessed by DNV GL, dated on 2015-10-20.
- Test Report No. AP 17-04 issued by Airex AG, dated on 2017-03-09.
- Test Report No. AP 18-04 issued by Airex AG, dated on 2018-08-17
- Quality documentation

Assessed production site

Airex AG
Speciality Foams
Industrie Nord 26
5643 Sins
Switzerland

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

Fatigue tests with the ratio R = 0.1 based on DNV GL's test instruction have shown a S/N curve > 10.

This certificate supersedes the Type Approval WP 1610001 HH.

END OF CERTIFICATE