

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Sandwich Core Materials

with type designation(s)

AIREX® T90.60, AIREX® T90.100, AIREX® T90.150, AIREX® T90.210

Issued to

**Airex AG, 3A Composites
Sins, 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

DNV GL standard DNVGL-ST-0342 – Craft

Det Norske Veritas' Standards for Certification No. 2.20, Lifeboats and Rescue Boats, 2007

Application :

Core material for sandwich construction.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

This Certificate is valid until **2021-10-11**.

Issued at **Høvik** on **2016-10-12**

DNV GL local station: **Augsburg**

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: **TAK00000GD**

Product description

AIREX® T90.60, AIREX® T90.100, AIREX® T90.150, AIREX® T90.210; Closed-cell, thermoplastic core materials for sandwich construction.

The following manufacturer's specified values are confirmed by Type Testing:

Properties	Test Method	T90.60	T90.100	T90.150	T90.210	Unit	
Tensile strength	ASTM C297	1.5	2.2	2.7	3.0	MPa	msv
Tensile strength, min.	ASTM C297	1.2	1.6	2.2	2.4	MPa	msmv
Tensile modulus	ASTM C297	85	120	170	225	MPa	msv
Tensile modulus, min.	ASTM C297	70	90	140	180	MPa	msmv
Compressive strength	ISO 844	0.80	1.4	2.2	3.5	MPa	msv
Compressive strength, min.	ISO 844	0.7	1.2	2.0	3.2	MPa	msmv
Compressive modulus	ISO 844	50	80	105	170	MPa	msv
Compressive modulus, min.	ISO 844	35	70	95	145	MPa	msmv
Shear strength	ISO 1922	0.46	0.8	1.2	1.85	MPa	msv
Shear strength, min.	ISO 1922	0.4	0.7	1.1	1.5	MPa	msmv
Shear modulus	ISO 1922	12	20	30	50	MPa	msv
Shear modulus, min.	ISO 1922	10.5	18	26	44	MPa	msmv
Shear elongation at break, min.	ISO 1922	15	5	4	3	%	msmv
Density, nominal	ISO 845	65	110	145	210	kg/m ³	msv
Density, min.	ISO 845	60	105	140	200	kg/m ³	msmv
Heat resistance, % retention of shear strength, +60 °C	ASTM C393	80	80	80	80	%	msv
Water resistance, % retention of compressive and tensile strength	ASTM C393	>80	>80	>80	>80	%	

Legends:

msmv = Manufacturer's Specified Minimum Value

msv = Manufacturer's Specified Value (average value of test results)

Remarks:

The materials comply with DNV GL requirements to water absorption and max. operating temperature.
Shear measurements done across the weld lines in the foam sheet.

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 and/or package shall be marked with *manufacturer's name*; **Airex AG, 3A Composites, Sins, Switzerland** and *type designation*.



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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.

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