# AIREX® T92

GM--TDS-121

***Structural and Sustainable***

**DATA SHEET 08.2022 - Replaces 12.2021**

## DESCRIPTION

**AIREX® T92** is a closed-cell, thermoplastic and recyclable polymer foam with very good mechanical properties and an outstanding price / performance ratio.

It has an extraordinary resistance to fatigue, is chemically stable and has negligible water absorption. It is thermally stable during high temperature processing and post curing without after expansion or out-gassing. T92 is designed for easy use with all resin systems and processing techno-logies.

**AIREX® T92** is ideally suited as a core material for a wide variety of lightweight sandwich structures subjected to static and dynamic loads and/or exposed to elevated temperatures during manufacturing.

## CHARACTERISTICS

- Easy to process with all types of resin and lamination processes
- High process temperature up to 150 °C (302 °F)
- Outstanding fatigue strength
- Best-in-class resin uptake
- Very high chemical stability
- Good adhesion (skin-to-core bond)
- Excellent long term thermal stability up to 100 °C (212 °F)
- No water absorption, after expansion nor out-gassing
- Recyclable and recycled material
- Highly consistent material properties
- Comprehensive material traceability (machine-readable batch information on each foam sheet)

## APPLICATIONS

- **Renewable energy:** Blades (shear webs & shells), nacelles
- **Marine:** Decks, hull sides, superstructures, bulkheads, transoms, interiors
- **Industrial:** Covers, containers, local reinforcements, x-ray tables, sporting goods
- **Automotive:** Truck body parts, floors

## PROCESSING

- Contact molding (hand/spray)
- Vacuum infusion
- Resin infusion / injection (VARTM / RTM)
- Adhesive bonding
- Pre-preg processing
- Compression molding (GMT, SMC)
- Thermoforming


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AIREX®

3A COMPOSITES CORE MATERIALS

| MECHANICAL PROPERTIES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Typical properties for AIREX® T92** | | **Unit (metric)** | **Value[1)]** | **T92.60** | **T92.80** | **T92.100** | **T92.130** | **T92.200** | **T92.320[3)]** |
| Density | ISO 845 | kg/m³ | Average<br>*Typ. range* | 65<br>*60 - 70* | 85<br>*80 - 90* | 100<br>*95 - 105* | 135<br>*127 - 143* | 210<br>*200 - 220* | 320<br>*310 - 330* |
| Compressive strength perpendicular to the plane | ISO 844<br>ASTM C365[4)] | N/mm² | Average<br>*Minimum* | 0.85<br>*0.75* | 1.3<br>*1.1* | 1.75<br>*1.4* | 2.4<br>*2.1* | 3.8<br>*3.2* | 7.1<br>*6.5* |
| Compressive modulus perpendicular to the plane | ASTM C365[4)] | N/mm² | Average<br>*Minimum* | 55<br>*45* | 75<br>*60* | 90<br>*65* | 140<br>*110* | 180<br>*150* | 280<br>*240* |
| Tensile strength perpendicular to the plane | ASTM C297 | N/mm² | Average<br>*Minimum* | 1.5<br>*1.3* | 1.9<br>*1.4* | 2.3<br>*1.5* | 2.6<br>*2.0* | 3.1<br>*2.5* | 4.5 |
| Tensile modulus perpendicular to the plane | ASTM C297 | N/mm² | Average<br>*Minimum* | 85<br>*75* | 90<br>*80* | 110<br>*90* | 175<br>*130* | 230<br>*190* | 420 |
| Shear strength | ISO 1922 | N/mm² | Average<br>*Minimum* | 0.55<br>*0.46* | 0.72<br>*0.65* | 0.9<br>*0.75* | 1.3<br>*1.1* | 2.0<br>*1.6* | 3.5<br>*3.0* |
| Shear modulus<br>Parallel to welding lines<br>Across welding lines<br>*Across welding lines* | ISO 1922 | N/mm² | <br>Average<br>Average<br>*Minimum* | <br>15<br>14<br>*12* | <br>22<br>19.5<br>*16* | <br>26<br>23<br>*19* | <br>34<br>30<br>*25* | <br>55<br>50<br>*45* | <br>110<br>110<br>*90* |
| Shear elongation at break | ISO 1922 | % | Average<br>*Minimum* | 25<br>*15* | 30<br>*20* | 20<br>*10* | 12<br>*8* | 6<br>*4* | 5<br>*3* |
| Thermal conductivity at 10 °C | EN 12667 | W/m.K | Average | 0.037 | 0.030 | 0.034 | 0.037 | 0.045 | 0.066 |
| Standard sheet | Width[2)] | mm ± 5 | | 1220 | 1220 | 1220 | 1220 | 1220 | 1220 |
| | Length[2)] | mm ± 5 | | 2440 | 2440 | 2440 | 2440 | 2440 | 2440 |
| | Thickness | mm ± 0.5 | | 5 to 100 | 5 to 100 | 5 to 100 | 5 to 100 | 5 to 100 | 5 to 50 |

Finishing Options, other dimensions and closer tolerances upon request

[1)] Statistical minimum values; test sample thickness 20 mm except thermal conductivity (50 mm)
[2)] Alternative width 610 mm, alternative length 1220 mm
[3)] Preliminary data
[4)] with surface stabilization

The data provided gives approximate values for the nominal density and DNV-GL minimum values according to DNV-GL type approval certificate.

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3A COMPOSITES CORE MATERIALS

| MECHANICAL PROPERTIES | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Typical properties for AIREX® T92** | | **Unit (imperial)** | **Value[1)]** | **T92.60** | **T92.80** | **T92.100** | **T92.130** | **T92.200** | **T92.320[3)]** |
| Density | ISO 845 | lb/ft³ | Average<br>*Typ.range* | 4.1<br>*3.7 - 4.4* | 5.3<br>*5.0 - 5.6* | 6.2<br>*5.9 - 6.6* | 8.4<br>*7.9 - 8.9* | 13<br>*12.5 - 13.7* | 20<br>*19.4 - 20.6* |
| Compressive strength perpendicular to the plane | ISO 844<br>ASTM C365[4)] | psi | Average<br>*Minimum* | 123<br>*109* | 188<br>*160* | 254<br>*203* | 350<br>*305* | 551<br>*464* | 1'030<br>*943* |
| Compressive modulus perpendicular to the plane | ASTM C365[4)] | psi | Average<br>*Minimum* | 7'980<br>*6'530* | 10'880<br>*8'700* | 13'050<br>*9'425* | 20'310<br>*15'950* | 26'100<br>*21'750* | 40'610<br>*34'810* |
| Tensile strength perpendicular to the plane | ASTM C297 | psi | Average<br>*Minimum* | 218<br>*189* | 275<br>*203* | 330<br>*218* | 377<br>*290* | 450<br>*360* | 653 |
| Tensile modulus perpendicular to the plane | ASTM C297 | psi | Average<br>*Minimum* | 12'330<br>*10'880* | 13'050<br>*11'600* | 15'950<br>*13'050* | 25'380<br>*18'850* | 33'360<br>*27'550* | 60'920 |
| Shear strength | ISO 1922 | psi | Average<br>*Minimum* | 80<br>*67* | 104<br>*94* | 130<br>*109* | 190<br>*160* | 290<br>*230* | 508<br>*435* |
| Shear modulus<br>Parallel to welding lines<br>Across welding lines<br>*Across welding lines* | ISO 1922 | psi | <br>Average<br>Average<br>*Minimum* | <br>2'180<br>2'030<br>*1'740* | <br>3'190<br>2'830<br>*2'320* | <br>3'770<br>3'335<br>*2'755* | <br>4'960<br>4'350<br>*3'625* | <br>7'975<br>7'250<br>*6'525* | <br>15'950<br>15'950<br>*13'050* |
| Shear elongation at break | ISO 1922 | % | Average<br>*Minimum* | 25<br>*15* | 30<br>*20* | 20<br>*10* | 12<br>*8* | 6<br>*4* | 5<br>*3* |
| Thermal conductivity at 50 °F | EN 12667 | Btu.in/hr.ft².F | Average | 0.257 | 0.208 | 0.236 | 0.257 | 0.312 | 0.458 |
| Standard sheet | Width[2)] | in ± 0.2 | | 48 | 48 | 48 | 48 | 48 | 48 |
| | Length[2)] | in ± 0.2 | | 96 | 96 | 96 | 96 | 96 | 96 |
| | Thickness | in ± 0.02 | | ⅛ to 4 | ⅛ to 4 | ⅛ to 4 | ⅛ to 4 | ⅛ to 4 | 0.2 to 2 |

Finishing Options, other dimensions and closer tolerances upon request

[1)] Statistical minimum values; test sample thickness 20 mm (3/4") except thermal conductivity 50 mm (2")

[2)] Alternative width 24", alternative length 48"

[3)] Preliminary data

[4)] with surface stabilization

The data provided gives approximate values for the nominal density and DNV-GL minimum values according to DNV-GL type approval certificate.