AIREX® T90

GM--TDS-122

The Fire Retardant Structural Foam

DATA SHEET 01.2020 - Replaces 11.2018

DESCRIPTION

AIREX® T90 is a closed-cell, thermoplastic and recyclable polymer foam with excellent fire, smoke & toxicity (FST) properties.

It has very good mechanical properties and an extraordinary resistance to fatigue, is chemically stable and has negligible water absorption. It is thermally stable during high temperature processing and post curing. T90 is designed for easy use with all resin systems and processing technologies.

AIREX® T90 is the ideal core material for structural sandwich applications requiring high fire resistance.

CHARACTERISTICS

- Superior fire retardancy (FAR 25.853; EN 45545, EN 13501)
- Outstanding fatigue strength
- Excellent long term thermal stability up to 100 °C (212 °F)
- Best thermal stability in process up to 150 °C (302 °F)
- Good thermal insulation
- Highly consistent material properties
- Easy to process with all types of resin and lamination processes
- Good adhesion (skin-to-core bond)
- Very high chemical stability
- No water absorption, no after-expansion, no outgassing

APPLICATIONS

- **Aerospace:** Interiors, galleys, meal trolleys, radomes
- **Road and Rail:** Floors, sidewalls, front ends, interiors, roofs, engine covers
- **Marine:** Decks, interiors, superstructures
- **Industrial:** Covers, containers, x-ray tables, sporting goods
- **Architecture and Construction:** Roofs, claddings, domes, portable building

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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MECHANICAL PROPERTIES							
Typical properties for AIREX® T90		**Unit (metric)**	**Value[1)]**	**T90.60**	**T90.100**	**T90.150**	**T90.210**
Density	ISO 845	kg/m³	Average *Typ. range*	65 *60 - 70*	110 *105 - 115*	145 *140 - 150*	210 *200 - 220*
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average *Minimum*	0.80 *0.7*	1.4 *1.2*	2.2 *2.0*	3.8 *3.2*
Compressive modulus perpendicular to the plane	ISO 844	N/mm²	Average *Minimum*	50 *35*	80 *70*	105 *95*	170 *145*
Tensile strength perpendicular to the plane	ASTM C297	N/mm²	Average *Minimum*	1.5 *1.2*	2.2 *1.6*	2.7 *2.2*	3.0 *2.4*
Tensile modulus perpendicular to the plane	ASTM C297	N/mm²	Average *Minimum*	85 *70*	120 *90*	170 *140*	225 *180*
Shear strength	ISO 1922	N/mm²	Average *Minimum*	0.46 *0.4*	0.8 *0.7*	1.2 *1.1*	1.85 *1.5*
Shear modulus	ISO 1922	N/mm²	Average *Minimum*	12 *10.5*	20 *18*	30 *26*	50 *44*
Shear elongation at break	ISO 1922	%	Average *Minimum*	25 *15*	10 *5*	8 *4*	5 *3*
Thermal conductivity at 10°C	EN 12667	W/m.K	Average	0.037	0.035	0.038	0.045
Standard sheet	Width[2)]	mm ± 5		1220	1220	1220	1220
	Length[2)]	mm ± 5		2440	2440	2440	2440
	Thickness	mm ± 0.5		5 to 100	5 to 100	5 to 100	5 to 100

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

Fire performance	**Standard**		**T90.60**	**T90.100**	**T90.150**	**T90.210**
Aircraft	FAR/CS 25.853/ABD0031	Flammability (60s)	passed	passed	passed	passed
	FAR/CS 25.853/ABD0031	Smoke density	passed	passed	passed	passed
	FAR/CS 25.853/ABD0031	Toxicity	passed	passed	passed	passed
Rail	EN 45545-2	Sandwich	HL3 achievable, depending on sandwich design[3)]			
		Core alone	HL3 achievable[4)]			
Building & Construction	DIN 4102-1	Material Class	tbd	B1[5)]	tbd	B1[5)]
Building & Construction	EN 13501-1	Fire reaction behaviour Smoke production Flaming droplets	B[5)] s1 d0	C[5)] s2 d0	tbd	C[5)] s2 d0

[3)] Certificates available for specific sandwich designs
[4)] Depending on density, thickness and application; test results on request
[5)] May depend on thickness

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

MECHANICAL PROPERTIES							
Typical properties for AIREX® T90		**Unit (imperial)**	**Value[1)]**	**T90.60**	**T90.100**	**T90.150**	**T90.210**
Density	ISO 845	lb/ft³	Average *Typ. range*	4.1 *3.7 - 4.4*	6.8 *6.6 - 7.2*	9.1 *8.7 - 9.4*	13 *12.5 - 13.7*
Compressive strength perpendicular to the plane	ISO 844	psi	Average *Minimum*	116 *102*	203 *174*	319 *290*	551 *464*
Compressive modulus perpendicular to the plane	ISO 844	psi	Average *Minimum*	7'250 *5'075*	11'600 *10'150*	15'230 *13'780*	24'650 *21'025*
Tensile strength perpendicular to the plane	ASTM C297	psi	Average *Minimum*	218 *174*	319 *232*	392 *319*	435 *350*
Tensile modulus perpendicular to the plane	ASTM C297	psi	Average *Minimum*	12'325 *10'150*	17'400 *13'050*	24'650 *20'300*	32'630 *26'100*
Shear strength	ISO 1922	psi	Average *Minimum*	67 *58*	116 *102*	174 160	268 *215*
Shear modulus	ISO 1922	psi	Average *Minimum*	1'740 *1'520*	2'900 *2'610*	4'350 *3'770*	7'250 *6'380*
Shear elongation at break	ISO 1922	%	Average *Minimum*	25 *15*	10 *5*	8 *4*	5 *3*
Thermal conductivity at 50°F	EN 12667	Btu.in/ hr.ft².F	Average	0.257	0.243	0.263	0.312
Standard sheet	Width[2)]	in ± 0.2		48	48	48	48
	Length[2)]	in ± 0.2		96	96	96	96
	Thickness	in ± 0.02		⅛ to 4	⅛ to 4	⅛ to 4	⅛ to 4

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"

Fire performance	**Standard**		**T90.60**	**T90.100**	**T90.150**	**T90.210**
Aircraft	FAR/CS 25.853/ABD0031	Flammability (60s)	passed	passed	passed	passed
	FAR/CS 25.853/ABD0031	Smoke density	passed	passed	passed	passed
	FAR/CS 25.853/ABD0031	Toxicity	passed	passed	passed	passed
Rail	EN 45545-2	Sandwich	HL3 achievable, depending on sandwich design[3)]			
		Core alone	HL3 achievable[4)]			
Building & Construction	DIN 4102-1	Material Class	tbd	B1[5)]	tbd	B1[5)]
Building & Construction	EN 13501-1	Fire reaction behaviour Smoke production Flaming droplets	B[5)] s1 d0	C[5)] s2 d0	tbd	C[5)] s2 d0

[3)] Certificates available for specific sandwich designs
[4)] Depending on density, thickness and application; test results on request
[5)] May depend on thickness

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