

Sandwich core with high FST properties

Divinycell F is a recyclable, prepreg compatible sandwich core offering excellent Fire, Smoke and Toxicity (FST) properties, good mechanicals and processing characteristics.

It exceeds the US and European regulatory requirements for commercial aircraft interiors.

Mechanical properties Divinycell® F Grade

Properties and test procedures		Unit	F 40 ¹	F 50	F 90
Density	ASTM D 1622	kg/m ³	40	50	90
		lb/ft ³	2.5	3.1	5.6
Compressive strength	ASTM D 1621	MPa	0.4	0.6	0.7
		psi	58	73	102
Compressive modulus	ASTM D 1621-B-73	MPa	25	30	40
		psi	3,625	4,350	5,800
Tensile strength	ASTM D 1623	MPa	1.5	1.7	2.15
		psi	217.5	247	312
Shear strength	ASTM C 273	MPa	0.5	0.7	1.1
		psi	72.5	87	160
Shear modulus	ASTM C 273	MPa	4.5	7.5	9.5
		psi	652.5	1,090	1,380
Possion's ratio	ASTM D 638		0.32	0.32	0.35
Shear Strain	ASTM C 273	%	70	70	65
Dielectric Constant	ASTM D 2520-01 A	9.375 GHz	TBD	1.10	TBD
Loss Tangent	ASTM D 2520-01 A	9.375 GHz	TBD	0.0018	TBD

1. All F 40 data are preliminary

Other key features include 220°C (425°F) processing temperature, superior damage tolerance, exceptional fatigue life, low water absorption, good chemical resistance, excellent hot/wet properties and excellent heat ageing at 180°C (356°F).

Divinycell F is compatible with most common composite manufacturing processes. In addition Divinycell F is both hot and cold formable. For optimal design of applications used in high operating temperatures in combination with continuous load, please contact DIAB Technical Services for detailed design instructions.

Product Characteristics

- High temperature resistance
- Excellent FST properties
- Low water absorption
- Excellent heat ageing
- Hot and cold formable
- Superior damage tolerance
- Fast and easy to process
- No film adhesive required
- No need to edge fill
- Good chemical resistance

Fire, Smoke & Toxicity Properties

	Quality	Standard	Test Method	F 40 ¹	F50	F 90	Regulation
Aviation	OSU Heat Release ²	FAR 25.853d	-	<20/20	<15/15	<20/20	<65/65 <55/55
	Smoke	FAR 25.853	ASTM E-662	<1/1	<1/1	<1/1	<100/200
	Toxicity	ABD 0031 / BSS 7239	-	Pass	Pass	Pass	3
	Vertical Burn ⁴	FAR 25.853	-	Pass	Pass	Pass	<6/SE/N/D
Rail	Spread of Flame	CEN TS 45545-2	ISO 5658-2:1996	TBD	TBD	CHF=48 kW/m ²	>37,8 passed HL4
	Heat Release Rate	CEN TS 45545-2	ISO 5660-1:2002	TBD	TBD	30,5 kW/m ² , MAHRE	<60 passed HL4
	Optical Density	CEN TS 45545-2	EN ISO 5659-2	TBD	TBD	VOF4 = 50	<300 passed HL4
	Smoke Density	CEN TS 45545-2	EN ISO 5659-2	TBD	TBD	Ds(4) = 41	<150 passed HL4
	Toxicity	CEN TS 45545-2	EN ISO 5659-2	TBD	TBD	CIT at 8 mins = 0,59 CIT at 4 mins = 0,21	<0.75 passed HL4
	Flammability	NF F16-101	NF 92-501	TBD	M1	M1	-
	Toxicity	NF F16-101	NFX 10-702	TBD	F1	F1	-
	Smoke	NF F16-101	NFX 70-100	TBD	F1	F1	-
	Flammability	DIN 5510/2	-	TBD	TBD	S4	-
	Smoke	DIN 5510/2	-	TBD	TBD	SR2	-
Dripping	DIN 5510/2	-	TBD	TBD	ST2	-	

1. All F 40 data are preliminary
2. F40, F50 and F90 are tested on 12.7 mm material
3. CO, CO₂, NO_x, SO₂, HCl, HF, HBr, HCN
4. Test was performed on 9.35 mm material

Temperature & Processing Compatibility

On Set Tg	205°C / 401°F
Tg	225°C / 437°F
Vacuum Bag Processing	To 200°C / 392°F
Matched Tooling / Press Processing	To 220°C with stops / 428°F with stops
Coefficient of linear expansion (ASTM D-696)	2 x 10 ⁻⁵ /°F
Density Tolerance	±10%

Maximum temperature is dependent on time, pressure and processing conditions. Therefore users are advised to contact DIAB Technical Services to confirm that Divinycell F is compatible with their particular processing parameters.

Disclaimer:

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Issued: April 2011

Doc No: F-ds.04_2011.rev15

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