Fibrelam®

Panels for aircraft flooring

Product Data

Description

Fibrelam® structural sandwich panels have been in service since 1973 and are currently approved for flooring by major aircraft manufacturers and airlines worldwide. These extensively flight-proven panels offer outstanding mechanical and physical properties, can be easily cut and machined on equipment normally found in airline maintenance shops, and are easy to install.

Features

- Unidirectional cross-plied fibreglass skins bonded to aramid honeycomb core
- Lightweight, high performance
- Superior resistance to corrosion, moisture and fungus
- Low levels of smoke generation
- Optimized to improve properties such as impact
- Easily cut and machined or supplied as a finished panel

Applications

Panels in the following grades are available in standard sizes (see panel dimensions on page 3). In addition to the grades listed below, Fibrelam is also available in other grades, offering a broad range of performance characteristics.

Grade 1 panels are made with medium density honeycomb core and are suitable for high-traffic areas on the aircraft such as galleys, aisles, entrance ways and lavatories.

Grade 5 panels are made with low density core and are used for lower-traffic areas such as under seats.

Grade 1-3/3 panels are made with medium density honeycomb core and are designed to meet a combination of high bending load and impact resistance requirements in heavy-traffic areas. They are principally used in aisles and in the wing carry-through structure area of an aircraft.

Grade 1-4/2 panels are made with medium density honeycomb core and are designed to meet a combination of high bending load and impact resistance requirements. They are principally used in cargo areas.

Grade 11 and Grade 12 panels are made with high density honeycomb core and are suitable for very high-traffic areas such as galleys and entrance ways. The panels are designed to meet high shear and compression load requirements.

Grade 15 panels have the same density honeycomb as Grade 5 panels, but at an increased thickness. They are used in cargo areas.

Performance Data†

	Unit of Measure	Test Method	Grade 1	Grade 5	Grade 1-3/3	Grade 1-4/2	Grade 11	Grade 12	Grade 15
Long Beam Bending Core Ribbon, Transverse		MIL-STD-401B*							
Load	N (lbs)		1290 (290)	1250 (280)	2450 (550)	2460 (555)	2000 (450)	3540 (800)	2170 (490)
Deflection at 445N (100lb)	mm (in)		15.2 (0.60)	14.0 (0.55)	10.2 (0.40)	14.2 (0.56)	11.7 (0.46)	8.9 (0.35)	6.10 (0.24)
Humidity Resistance (100% at 60°C (140°F) for 30 days)		BSS 7250 Humidity							
Load	N (lbs)		1290 (290)	1220 (275)	1780 (400)	1730 (390)	1450 (325)	3070 (690)	
Panel Shear Strength Core Ribbon, Transverse	N (lbs)	MIL-STD-401B 3 point loading	3400 (760)	2000 (450)	3400 (760)	3400 (760)	4900 (1100)	5060 (1140)	3150 (710)
Sandwich Peel Core Ribbon, Transverse	N/76 mm (in-lbs/3" width)	MIL-STD-401B	330 (37)	330 (37)	330 (37)	330 (37)	400 (45)	420 (47)	340 (38)
In-Plane Shear	N/mm (lbs/in)	BMS 4-17	75 (430)	67 (380)	95 (540)	120 (700)	110 (635)	175 (1000)	78 (450)
Insert Shear	N (lbs)	BMS 4-17	6700 (1500)	6700 (1500)	7300 (1650)	6700 (1500)	4600 (1040)	5350 (1200)	6700 (1500)
Impact Resistance	Nm (in-lbs)	BMS 4-17	4.7 (42)	4.5 (40)	5.0 (44)	9.0 (80)	5.6 (50)	9.9 (88)	4.5 (40)
Stabilized Core Compression	N/mm^2 (lb/in^2)	MIL-STD-401B	14.5 (2100)	5.5 (800)	14.5 (2100)	14.5 (2100)	21.1 (3060)	25.8 (3740)	5.1 (740)
Warpage	mm/m (in/ft)		<0.8 (0.01)	<0.8 (0.01)	<0.8 (0.01)	<0.8 (0.01)	<0.8 (0.01)	<0.8 (0.01)	<0.8 (0.01)
Roller Cart Test									
Initial Operation	Cycles	BMS 4-17	120k	80k	120k	120K	120k	125K	80K
	N/wheel (lb/wheel)		534 (120)	436 (98)	534 (120)	534 (120)	700 (158)	747 (168)	436 (98)
Final Operation	Cycles	BMS 4-17	35k		35k	35K	35k	35K	
	N/wheel (lb/wheel)		700 (158)		700 (158)	700 (158)	800 (198)	881 (198)	
Flammability 60 Second Vertical Ignition:		BSS 7230							
Self-Extinguish Time	sec		4	4	5	10	6	8	5
Burn length	mm (in)		58 (2.3)	33 (1.3)	76 (3)	53 (2.1)	71 (2.8)	56 (2.2)	81 (3.2)
Drip Extinguish Time	sec		0	0	0	0	0	0	0
45 Degree Test:									
Self-Extinguish Time	sec		0	1	2	2.7	3	1	3.7
Penetration			None	None	None	None	None	None	None
Glow Time	sec		0	2	0	0	0	0	0

†Data is in metric with imperial equivalents in brackets.
*20 inch span, 1/4 point loading.

Original Equipment Manufacturer Qualifications

Boeing BMS 4-17:
- Type I
- Type II
- Type III
- Type IV
- Type V
- Type VI

Canadair:
- CES 827 GR 3

Beech Aircraft:
- BS23554

Lockheed Aircraft:
- C-28-1386 Type I
- C-28-1386 Type II

Embraer:
- MEP 15-031

McDonnell Douglas Aircraft:
- BZZ7002 Type I
- BZZ7002 Type II
- BZZ7002 Type III

British Aerospace:
- MAT 003

Panel Dimensions†*

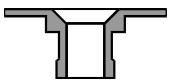
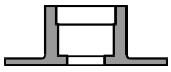
	Grade 1	Grade 5	Grade 1-3/3	Grade 1-4/2	Grade 11	Grade 12	Grade 15
Weight, kg/m² (lb/ft²) max	3.1 (0.64)	2.5 (0.52)	3.8 (0.78)	3.8 (0.78)	3.9 (0.80)	4.89 (1.00)	3.1 (0.63)
Overall Thickness, mm (in)	10.16± 0.25 (0.40± 0.01)	10.16± 0.25 (0.40± 0.01)	10.16± 0.25 (0.40± 0.01)	10.16± 0.25 (0.40± 0.01)	10.16± 0.25 (0.40± 0.01)	10.16± 0.25 (0.40± 0.01)	16.89± 0.25 (0.665± 0.01)
Skin Thickness, mm (in)	0.38 (0.015)	0.38 (0.015)	0.56 (0.022)	0.74 (0.029)/ 0.38 (0.015)	0.46 (0.018)	0.74 (0.029)	0.38 (0.015)
Length, mm (in) Stock Lengths Available	2440 (96) 3048 (120) 3658 (144)	2440 (96) 3048 (120) 3658 (144)	3658 (144)	3658 (144)	3658 (144)	3658 (144)	3658 (144)
Width, mm (in)	1220 (48)	1220 (48)	1220 (48)	1220 (48)	1220 (48)	1220 (48)	1220 (48)

†Data is in metric with imperial equivalents in brackets.
*Other lengths, widths, weights, and thicknesses of core available.

Installation

Hexcel Composites can furnish panels with standard aircraft inserts. The inserts use existing bolts in the aircraft structure, thus simplifying replacement and reducing workshop time by 50%. Inserts and instructions on installation procedures are available from your Hexcel Composites representative.

Two-part Press Fit

Cross Section	Bolt Size	Hole Size	Panel Thickness
Clearance type, upper part - countersunk			
	10-32	5.1mm (0.201 in)	10.16mm (0.40 in)
Clearance type, lower part			
	10-32	5.1mm (0.201 in)	10.16mm (0.40 in)

For detailed information on ferrule availabilty please consult Hexcel Composites' Fibrelam® Ferrules data sheet.

This information may be used for material selection purposes only.

Handling and Safety Precautions

When fabricating from honeycomb sandwich board materials it is advisable to wear disposable clean cotton or surgical gloves throughout the entire operation. This helps to keep the panel clean, and affords protection for the operator's hands.

Avoid breathing the dust generated by cutting operations, and do not rub the eyes with hands which may be contaminated with the dust.

The usual precautions should be observed while working with synthetic resins.

Product Safety Data Sheets have been prepared for all Hexcel Composites products and are available to company safety officers on request.

Important

Publication LTA063d (March 2007)

For More Information

Hexcel is a leading worldwide supplier of composite materials to aerospace and other demanding industries. Our comprehensive product range includes:

- Carbon Fibre
- RTM Materials
- Honeycomb Cores
- Continuous Fibre Reinforced Thermoplastics
- Carbon, glass, aramid and hybrid prepregs
- Reinforcement Fabrics
- Structural Film Adhesives
- Honeycomb Sandwich Panels
- Special Process Honeycombs

For US quotes, orders and product information call toll-free 1-800-688-7734

For other worldwide sales office telephone numbers and a full address list please go to:

http://www.hexcel.com/contact/salesoffices