HexWeb® Aluminum Flex-Core®
Formable Aluminum Honeycomb

HEXCEL®

Product Data Sheet

Description
HexWeb® Aluminum Flex-Core® honeycomb utilizes either 5052 or 5056 alloy foil material and is available in two cell sizes. Flex-Core® has unique cell configurations that significantly reduce anticlastic behavior and permit small radii of curvature without deformation of the cell walls or loss of mechanical properties.

Features
- Commercially available aluminum honeycomb core specifically designed for formability
- Retains mechanical properties in sharp curvatures
- Offers cost savings for curved panels
- Available in two cell sizes

Applications
HexWeb® Aluminum Flex-Core® has been developed by Hexcel to allow the designer and fabricator freedom in the utilization of honeycomb for components requiring simple and compound curvatures. Highly contoured sandwich panels such as leading edges and flaps, nacelles, fairings, doors and access covers, and other parabolic, spherical and cylindrical shapes are prime Flex-Core® candidates. Duplicate die model and control tooling for aerospace use are also examples of Flex-Core® applications.

As with standard aluminum honeycomb, Flex-Core® provides controlled crush characteristics without rebound and thus curved energy absorption units become feasible and economical.

HexWeb® CR-PAA outperforms standard AMS-C-7438 core in salt spray and crack propagation tests.

Type Designation
Hexcel HexWeb® Aluminum Flex-Core™ materials are designated as follows:

CR-PAA™ – 5052/F40 – 2.1*

CR III – 5052/F40 – 4.1*

Where:

CR-PAA™ – phosphoric acid anodized coating

CR III – CR III coating

5052 – aluminum alloy used

F40 – nominal cell count of open cells in 12 inches measured in the W direction

2.1 or 4.1 – is the nominal density in pounds per cubic foot

* If blank, cell walls are not vented; otherwise designated as v for vented cell walls. Vented cell walls require custom processing. Contact Customer Service for details and availability.

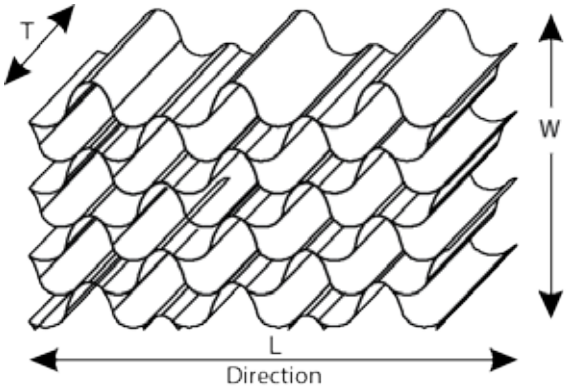
Coatings
HexWeb® Aluminum Flex-Core® is available with two types of corrosion-resistant coating. These coating are CRIII and phosphoric acid anodized (CR-PAA™). CR III is an organo-metallic polymer coating that offer protection for aluminum honeycomb exposed to corrosive environments. CR-PAA™ offers superior protection in extreme salt spray environments.

Dimensional Nomenclature

T = Thickness, or cell depth

L = Ribbon direction, or width

W = Expansion direction, or direction perpendicular to the ribbon



Images for explanation only and do not represent actual appearance.

Standard Dimensions

HexWeb® Aluminum Flex-Core® is available in the following standard sizes and dimensions in inches with the tolerances indicated:

Product	L	W	T max	T min
5052/F40	36" +2" - 0'	96" +4" - 0"	4.00	0.250
5056/F40	36" +2" - 0'	96" +4" - 0"	4.00	0.250
5052/F80	36" +2" - 0'	48" +4" - 0"	4.00	0.250
5056/F80	36" +2" - 0'	48" +4" - 0"	4.00	0.250

F = Flex-Core

All Flex-Core is cut to T and is not available in HOBE Form.

Special L, W, and T dimensions are available on request.

Note: The high-density materials may not be available at the maximum T dimensions due to expansion limitations.

Specifications

Density: Standard tolerance is ±10% from the nominal density shown in Table 1.

Thickness: Standard tolerance is as follows:

Cut T: inches	Tolerance: inches
0.250 – 3.999 in.	±0.005
4.000 – over	±0.062

Availability

Flex-Core® material will be shipped as follow:
SHIPPING TERMS: FCA Hexcel, Casa Grande, AZ, USA (Incoterms 2010)
MATERIAL TITLE TRANSFER: Hexcel, Casa Grande, AZ, USA
Lead times will vary with the particular core type selected.
The information in this Data Sheet is subject to change without notice.
Contact your nearest Hexcel Sales Office for delivery information.

Table I: HexWeb® Aluminum Flex-Core Mechanical Properties

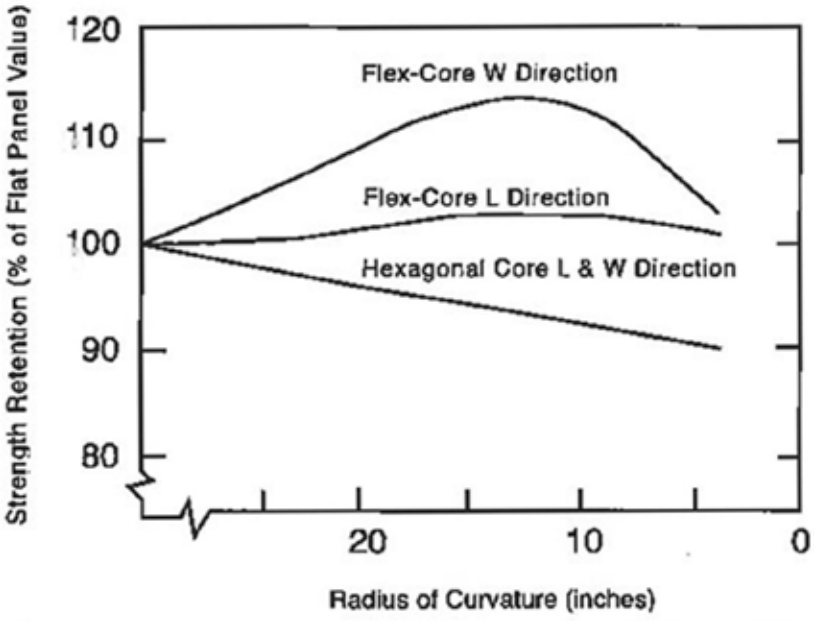
Typical values (typ) are presented below, as well as minimum average (min) for a product type.

	Material/ Cell Count – Gauge	Nominal Density pcf	Compressive Strength					Crush Strength psi	Beam Shear Strength					
			Bare		Stabilized				L Direction			W Direction		
			Strength psi		Strength psi		Modulus ksi		Strength psi		Modulus ksi	Strength psi		Modulus ksi
		typ	typ	min	typ	min	typ	typ	typ	min	typ	typ	min	typ
	F40 – .0013	2.1	200	126	225	157	65	80	90	63	18.0	50	37	10.0
	F40 – .0019	3.1	360	238	395	280	125	165	170	126	32.0	100	75	13.0
5	F40 – .0025	4.1	525	378	560	420	185	250	260	182	43.0	150	115	17.0
0	F40 – .0037	5.7	935	630	1050	700	290	380	400	280	68.0	230	170	23.0
5	F80 – .0013	4.3	524	402	542	455	195	–	300	196	45.0	190	120	20.0
2	F80 – .0019	6.5	1200	700	1300	735	310	–	540	308	72.0	310	180	24.0
	F80 – .0025	8.0	1600	1100	1750	1120	400	–	650	434	98.0	455	260	31.0
	F80 – .0037	12.0	2700	2300	2600	2200	–	1500	1450*	1100*	160	1200*	825*	71.0
	F40 – .0014	2.1	240	150	260	182	65	–	105	74	18.0	55	42	10.0
5	F40 – .0020	3.1	460	284	465	329	125	–	200	150	32.0	120	90	13.0
0	F40 – .0025	4.1	680	440	740	483	185	–	310	217	45.0	200	132	17.0
5	F80 – .0014	4.3	780	475	860	518	195	–	375	235	47.0	240	138	20.0
6	F80 – .0020	6.5	1400	805	1500	910	310	–	645	364	73.0	420	213	24.0
	F80 – .0023	8.0	1800	1210	1950	1260	410	–	850	518	100.0	570	307	32.0

*Note - * Results using Beam Shear*

For customers requiring specialized flexcore which can accommodate venting between cells, Hexcel offers “vented” Flex-Core. Vented Flex-Core is a custom processing addition to standard Flex-Core. The venting is a rectangular shaped vent in the free cell wall of the flexcore honeycomb. The standard vented product has a vent spacing of approximately 0.750” in the T direction. Custom configurations may be available an additional charge. Please contact your Hexcel sales associate to determine if your requirements can be achieved with this specialized flexcore honeycomb. All vented Flex-Core is subject to minimum buys for specific thicknesses, expanded slices only, one specification per order.

Table II: Effect of Radius Curvature on Shear Strength



Note: This data was derived from 3.8 pcf Hexagonal Core and 4.3 pcf Flex-Core®.

For more information

Hexcel is a leading worldwide supplier of composite materials to aerospace and industrial markets. Our comprehensive range includes:

- HexTow® carbon fibers
- HexForce® reinforcements
- HiMax™ multiaxial reinforcements
- HexPly® prepregs
- HexMC® molding compounds
- HexFlow® RTM resins
- Redux® adhesives
- HexTool® tooling materials
- HexWeb® honeycombs
- Acousti-Cap® sound attenuating honeycomb
- Engineered core
- Engineered products

For US quotes, orders and product information call toll-free 1-888-611-4038. For other worldwide sales office telephone numbers and a full address list, please go to:

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

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