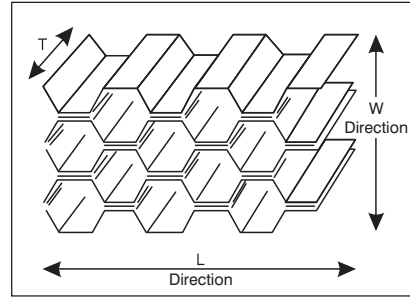


Honeycomb Configurations

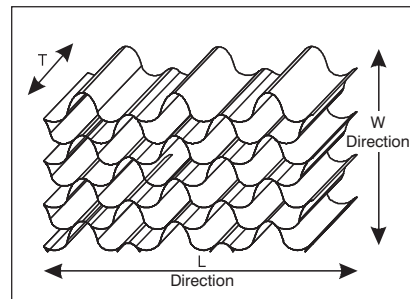
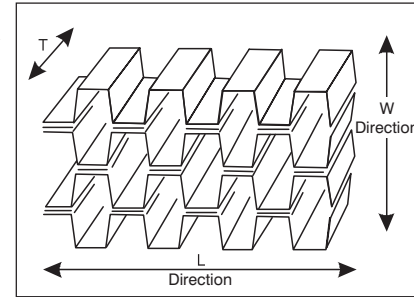


Hexagonal Core

The standard hexagonal honeycomb is the basic and most common cellular honeycomb configuration, and is currently available in all metallic and non-metallic materials.

OX-Core®

The "OX" configuration is a hexagonal honeycomb that has been over-expanded in the "W" direction, providing a rectangular cell configuration that facilitates curving or forming in the "L" direction. The OX process increases "W" shear properties and decreases "L" shear properties when compared to hexagonal honeycomb.

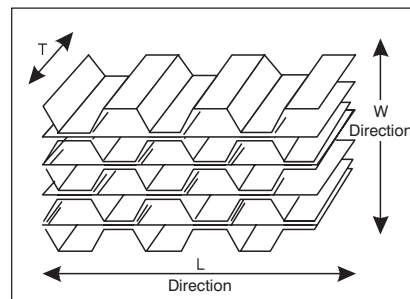
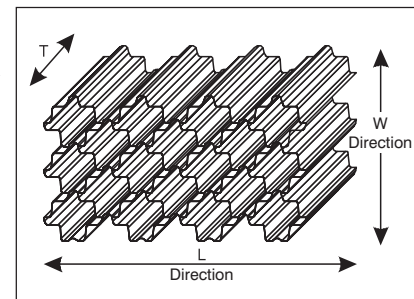


Flex-Core®

The Flex-Core cell configuration provides for exceptional formability in compound curvatures with reduced anticlastic curvature and without buckling the cell walls. Curvatures of very tight radii are easily formed. When formed into tight radii, Flex-Core provides higher shear strengths than comparable hexagonal core of equivalent density. Flex-Core is manufactured from aluminium HRH-10, HRH-36 and HRP substrates.

Double-Flex®

Double-Flex is a unique large cell Aluminium Flex-Core with excellent formability and high specific compression properties. Double-Flex is the most formable cell configuration.

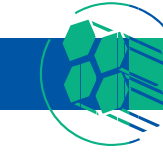


Reinforced Hexagonal

Reinforced honeycomb has a sheet of substrate material placed along the nodes in the ribbon direction to increase the mechanical properties. The Reinforced Hexagonal configuration provides a heavy density honeycomb suitable for high load areas such as attachment points.

Other Configurations

The standard honeycomb configurations described above will meet almost all requirements. Hexcel can also design and fabricate special configuration honeycomb in response to specific needs.



Important

All information is believed to be accurate but is given without acceptance of liability. Users should make their own assessment of the suitability of any product for the purposes required. All sales are made subject to our standard terms of sale which include limitations on liability and other important terms.

©Copyright Hexcel
Publication ATU024e (Jun 2009)

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
- Carbon, glass, aramid and hybrid prepregs
- HexTOOL® composite tooling material
- Structural Film Adhesives
- Honeycomb Sandwich Panels
- Engineered Core
- Reinforcement Fabrics

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>

Introduction

Honeycomb is a lightweight core material for structural stiffening applications. This versatile material is widely used in the construction of aircraft components such as floors, interior panelling and helicopter rotor blade aerofoils. Other applications include railway carriage doors and ceiling panels, marine bulkheads and furniture. Honeycomb is also the ideal material for energy absorption (bumpers/fenders, lift shaft bases), for RF shielding and fluid and light directionalisation.

This guide has been compiled to assist with the selection of the best type of honeycomb for a particular application. More detailed information is included in the individual product data sheets.

METALLIC

Product type	Strength	Stiffness	Dielectric Performance	Max Service Temp. °C (°F)	Thermal Conductivity/ Characteristics	Product Form	Density Range kg/m ³ (lb/cf)	Recommended For Energy Absorption	Treatment Options	Environmental Resistance
ALUMINIUM	High	Very High	Low Transmission	175 (350)	High	Hexagonal cell	16 to 192 (1 to 12)	Yes	CR111 Corrosion resistant coating that meets MIL-C-7438 Specifications	Good
						OX cell	42 to 169 (2.5 to 10.5)			
						Rigicell® (corrugated)	168 to 880 (10.5 to 55)	Yes		
ALUMINIUM Honeycomb	High	Very High	Low Transmission	175 (350)	High	Flexcore	34 to 128 (2 to 8)		CR-PAA treated and primed	Excellent
						Double-Flex	44 to 77 (3 to 5)			
ALUMINIUM Honeycomb	High	Very High	Low Transmission	175 (350)	High	Hexagonal cell	16 to 147 (1 to 9)	Yes	CR111 Corrosion resistant coating that meets MIL-C-7438 Specifications	Good
ACG Commercial Grade Aluminium Honeycomb	High	Very High	Low Transmission	175 (350)	High	Hexagonal cell	27 to 83 (1.7 to 5.2)	Yes	CRF Chromium free coating (available in Europe)	Good

NON-METALLIC

Product type	Strength	Stiffness	Dielectric Performance	Max Service Temp. °C (°F)	Thermal Conductivity/ Characteristics	Product Form	Density Range kg/m ³ (lb/cf)	Environmental Resistance	Cost
ARAMID	High	Low	Good Transmission	175 (350)	Low	Hexagonal cell	24 to 144 (1.5 to 9)		
						OX cell	29 to 72 (1.8 to 4.5)	Excellent	Moderate
						Flexcore	40 to 88 (2.5 to 5.5)		
META - ARAMID PAPER	High	Low	Good Transmission	175 (350)	Low	Hexagonal cell	32 to 144 (2 to 9)		
						OX cell	29 to 72 (1.8 to 4.5)	Excellent	Moderate
PARA - ARAMID	High	Low	Excellent Transmission	175 (350)	Low	Hexagonal cell	29 to 80 (1.8 to 5)		
						Hexagonal cell	24 to 96 (1.5 to 6)		
						OX cell	32 to 48 (2 to 3.0)	Excellent	High
PARA - ARAMID	High	High	Good Transmission	175 (350)	Low	Flexcore	32 to 56 (2 to 3.5)		
						Hexagonal cell	34 (2.1)	Excellent	High

*Du Pont Trademark

NON-METALLIC

Product type	Strength	Stiffness	Dielectric Performance	Max Service Temp. °C (°F)	Thermal Conductivity/ Characteristics	Product Form	Density Range kg/m ³ (lb/cf)	Environmental Resistance	Cost
GLASS	High	Moderate	Good Transmission	175 (350)	Low	Hexagonal cell	32 to 192 (2 to 12)		
						OX cell	51 to 112 (3.2 to 7)	Excellent	Moderate
						Flexcore	40 to 88 (2.5 to 5.5)		
GLASS	High	High	Good Transmission	175 (350)	Low	Hexagonal cell	32 to 128 (2 to 8)	Excellent	High
						OX cell	96 (6.0)		
GLASS	High	High	Excellent Transmission	260 (500)	Low	Hexagonal cell	51 to 128 (3.2 to 8)	Excellent	Very High
						Hexagonal Cell + Reinforced	16.0 to 17.5 (256 to 280)	Excellent	High