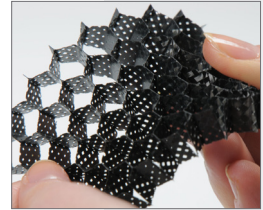


Description:

INVENT GmbH has developed CCORE®, a composite honeycomb structure as part of a co-funded national and ESA development programme. CCORE® is characterised by its homogeneous honeycomb, where no adhesive bonding is needed. CCORE® is available in various configurations, such as materials, densities, perforated walls, etc., allowing the honeycomb structure to be used for numerous applications.



All CCORE® manufacturing processes are performed at INVENT in Germany so that CCORE® can be sold ITAR free, the raw materials also being ITAR free products.

Features:

Depending on the fibre and resin types applied, the following features can be achieved:

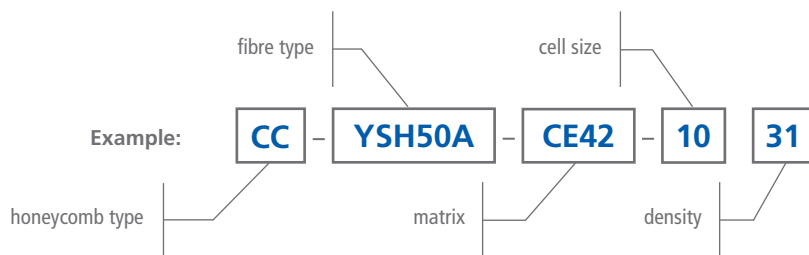
- High stiffness
- High strength
- Low density
- High or low thermal conductivity
- Low CTE & CME (high thermal stability)
- High service temperatures
- ITAR free
- Venting holes to enable vacuum applications

Applications:

The common fields of application for CCORE® are highly stable and low weight sandwich structures for the aerospace industry. High frequency band antenna reflectors used in space or optical benches are only two examples where highly precise and thermo elastically stable structures are required and CCORE® is used. The variety of different honeycomb types allows an adaptable use of CCORE® in several industry fields.

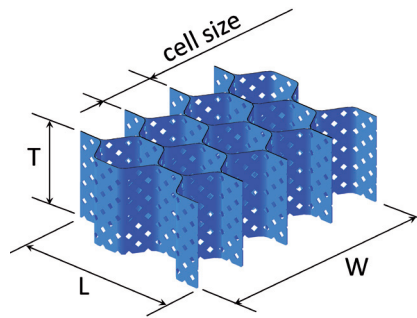
CCORE® Configurations:

Honeycomb type	Fibre type	Matrix	Cell size [mm]	Density [kg/m³]
CC – Carbon	YSH50A	Cyanate Ester	10	Depending on raw material
GC – Glass	YSH70A	Epoxy		
	T300 S-Glass			



Dimensional Nomenclature:

- T = Thickness/ cell depth
- L = Ribbon direction/ longitudinal direction
- W = Transverse direction/
direction perpendicular to the ribbon



Standard Dimensions, Tolerances:

CCORE® is available in a standardized block size of 900 (L) x 600 (W) x 180 (T) mm and a cell size of 10 mm. On special orders INVENT has the capability of manufacturing CCORE® in other dimensions. Further on, specified shapes can be milled out of the honeycomb block on special request.

Sheet Thickness	Standard Tolerances	L and W Tolerances	Density Tolerances
4 - 180 mm	± 50 µm	900(L) x 600(W) ± 1 mm	± 10 %

Mechanical Properties:

The following table provides users with typical mechanical properties obtained from different CCORE® types.

CCORE® Type	Unit Orientation	Density	Flatwise Compression ASTM C365		Flatwise Tensile ASTM C297		Plate Shear ASTM C273/C273-M-07a			
		[kg/m³]	Strength [Mpa]	Modulus [Mpa]	Strength [Mpa]	Modulus [Mpa]	Strength [Mpa]	Strength [Mpa]	Modulus [Mpa]	Modulus [Mpa]
			T	T	T	T	L	W	L	W
CC-YSH50A-CE42-10-31		31	0.96	206	1.38	289	0.87	0.48	232	100
CC-YSH70A-CE40-10-41		41	1.27	-	0.92	380	1.30	0.72	343	171
CC-T300-EP1-10-31		31	2.09	169	2.10	423	1.79	1.23	235	122
GC-SG-EP2-10-40		40	1.12	94	1.71	154	1.09	0.54	95	46

Thermo-mechanical properties as CTE, outgassing and thermal conductivity from specific configurations can be determined on request.

Handling:

CCORE® honeycomb should be handled with care. Gloves should be worn and bending of the product is not recommended.

Availability:

The Lead time can vary with the fibre type. Please contact the INVENT sales office for price and delivery information.

For more Information:

INVENT GmbH is a manufacturer of composite materials for aerospace industries and smart materials. Our competences include:

- Low weight composite and high
- High performance composite structures
- Honeycomb sandwich panels
- Satellite, aircraft, military, automotive and smart structures
- Structure analyses and optimization
- Natural-fibres
- CNC machining

Important Notice:

INVENT GmbH employs a quality management system that is DIN EN ISO 9001 und DIN EN 9100 certified.

The information contained in this data sheet is intended to be up to date, accurate and complete. However, the end-user of the described products is responsible to perform sufficient testing and evaluation to determine the suitability of the product.

INVENT makes no warranties of any kind regarding the described materials and information.