

# TECHNICAL DATASHEET

**3D CORE™ PET**

**3D CORE™ PET GR**

**3D CORE™ PET FR**

# 3D|CORE™ PET

## PROPERTIES AND TECHNICAL DATA

Status: 01.02.2021



The 3D|CORE™ PET is a closed-cell, thermoplastic, and recyclable rigid foam with excellent technical properties. It is suitable for the construction of high-strength lightweight components. The honeycomb structure provides more flexibility and is easy to handle.

The core is applicable with all known resin systems and processes. Certified according to DNV GL.

### PROPERTIES

- Excellent fatigue resistance
- Excellent long-term thermal stability up to 100°C
- Very high processing temperature up to 180°C
- Closed-cell foam (no water absorption, no re-expansion, no outgassing)
- Easy processing with all known resin systems and processes
- Very high chemical resistance
- Homogenous connection of all components
- Excellent surface adhesion (connection between the surfaces and core)
- Highly consistent material properties
- Good thermal insulation
- Integrated flow mesh

### APPLICATION

- Rail and road vehicles: roofs, floor panels, interior, front masks, side panels
- Ship and boat building: hull, deck, mast, superstructures, interior, keel
- Industrial components: container, covers, safety doors, sleeves, sport equipment
- Architecture and Construction: roofs, walls, panels
- Aviation: interior, kitchen furniture, radoms
- Motorsport: spoiler, bonnet, side elements, trunk lid
- Automotive: underbody protection, battery box, trunk plate, chassis
- Sports: Kanu, Surfboard, Skateboard

### PROCESSING

- Hand lay-up
- Vacuum Infusion
- Vacuum Assisted RTM (VARTM, LRTM and HP-RTM)
- Wet pressing
- Autoclave
- Prepreg
- SMC
- Bonding

**3D|CORE GMBH & CO. KG**  
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# 3D|CORE™ PET

## TECHNICAL DATA

Status: 01.02.2021

			FOAM TYPE	PET 150
			STRUCTURE	HX
DENSITY		kg/m <sup>3</sup>	3D CORE™ FOAM <sup>(1)</sup>	145 <sup>(3)</sup>
SHEAR MODULUS	ASTM C 273	MPa	3D CORE™ FOAM <sup>(1)</sup>	20,0
			3D CORE™ HYBRID <sup>(2)</sup>	87,0
SHEAR STRENGTH	ASTM C 273	MPa	3D CORE™ FOAM <sup>(1)</sup>	0,9
			3D CORE™ HYBRID <sup>(2)</sup>	1,2
COMPRESSION MODULUS	ISO 844:2014	MPa	3D CORE™ FOAM <sup>(1)</sup>	30,0
			3D CORE™ HYBRID <sup>(2)</sup>	245
COMPRESSION STRENGTH	ISO 844:2014	MPa	3D CORE™ FOAM <sup>(1)</sup>	0,9
			3D CORE™ HYBRID <sup>(2)</sup>	5,4
THERMAL CONDUCTIVITY	at 23°C	W/mK	3D CORE™ FOAM <sup>(1)</sup>	0,035
PERMITTIVITY	Frequency in GHz 5-10	ε	3D CORE™ FOAM <sup>(1)</sup>	1,63 – 1,64
MAX. PROCESSING TEMPERATURE		°C		180

MEASUREMENTS STANDARD SHEETS	WIDTH	mm ± 5		405
	LENGTH	mm ± 5		1015
	THICKNESS	mm ± 0,3		3-29

(1): The values above are the actual values of the suppliers of the precursor material. We cannot give a guarantee for the quality of the values and the related measurements. 3D|CORE primarily evaluates the properties of processing of the individual foam system knowing that the quality of the foam core is essential for the quality of the composite. The size of cavities and the properties have a major influence of the final part. Please regard that every part requires its own calculation of strength and component testing. (NH\_17.10.2017)

(2): The values above are based on measurements on specimen of sandwich panels made by 3D|CORE. These panels were produced with an Epoxy system and Vacuum Injection technology. These values can differ depending on the manufacturing process. Please use the above values only as an indication for your analysis and please provide your own measurements. Specimen thickness of 20mm. (NH\_22.01.2021)

Hybrid means foam core and structure filled with Epoxy resin.

(3): Tolerances +/-7 kg/m<sup>3</sup>

### STRUCTURE

HX: HEXAGON

### RESIN UPTAKE STRUCTURE HX (VACUUM INFUSION):

50g/m<sup>2</sup>/mm

The resin uptake depends on the process as well. Please only use this formula as an indication value.

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# 3D|CORE™ PET GR

## PROPERTIES AND TECHNICAL DATA

Status: 01.02.2021



The 3D|CORE™ PET GR foam core is a green foam made from 100% recycled material. The core is a closed-cell, thermoplastic and recyclable rigid foam with excellent technical properties. It is suitable for the construction of high-strength lightweight components. The integrated honeycomb structure provides more flexibility and is easy to handle.

The foam core follows the guidelines for recycling economy and contributes to the preservation and improvement of the human environment.

The core is applicable with all known resin systems and processes.

### PROPERTIES

- Excellent fatigue resistance
- Excellent long-term thermal stability up to 100°C
- Very high processing temperature up to 180°C
- Closed-cell foam (no water absorption, no re-expansion, no outgassing)
- Easy processing with all known resin systems and processes
- Very high chemical resistance
- Homogenous connection of all components
- Excellent surface adhesion (connection between the surfaces and core)
- Highly consistent material properties
- Good thermal insulation
- Integrated flow mesh

### APPLICATION

- Rail and road vehicles: roofs, floor panels, interior, front masks, side panels
- Ship and boat building: hull, deck, mast, superstructures, interior, keel
- Industrial components: container, covers, safety doors, sleeves, sport equipment
- Architecture and Construction: roofs, walls, panels
- Aviation: interior, kitchen furniture, radoms
- Motorsport: spoiler, bonnet, side elements, trunk lid
- Automotive: underbody protection, battery box, trunk plate, chassis
- Sports: Kanu, Surfboard, Skateboard

### PROCESSING

- Hand lay-up
- Vacuum Infusion
- Vacuum Assisted RTM (VARTM, LRTM and HP-RTM)
- Wet pressing
- Autoclave
- Prepreg
- SMC
- Bonding

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# 3D|CORE™ PET GR

## TECHNICAL DATA

Status: 01.02.2021

			FOAM TYPES	PET GR 75	PET GR 95	PET GR 200
			STRUCTURE	HX	HX	HX
DENSITY		kg/m <sup>3</sup>	3D CORE™ FOAM <sup>(1)</sup>	75 <sup>(3)</sup>	95 <sup>(3)</sup>	195 <sup>(3)</sup>
SHEAR MODULUS	ASTM C 273	MPa	3D CORE™ FOAM <sup>(1)</sup>	9	11	34
			3D CORE™ HYBRID <sup>(2)</sup>	42,53	60	145
SHEAR STRENGTH	ASTM C 273	MPa	3D CORE™ FOAM <sup>(1)</sup>	0,4	0,5	1,15
			3D CORE™ HYBRID <sup>(2)</sup>	0,85	1,02	1,66
COMPRESSION MODULUS	ISO 844:2014	MPa	3D CORE™ FOAM <sup>(1)</sup>	13	15	66
			3D CORE™ HYBRID <sup>(2)</sup>	144,87	184	280
COMPRESSION STRENGTH	ISO 844:2014	MPa	3D CORE™ FOAM <sup>(1)</sup>	0,3	0,45	1,8
			3D CORE™ HYBRID <sup>(2)</sup>	4,75	5,1	6,8
THERMAL CONDUCTIVITY	at 23°C	W/mK	3D CORE™ FOAM <sup>(1)</sup>	0,029	0,032	tbd
PERMITTIVITY	Frequency in GHz 5-10	ε	3D CORE™ FOAM <sup>(1)</sup>	1,63-16,4		
MAX. PROCESSING TEMPERATURE		°C		180		

MEASUREMENT STANDARD SHEETS	WIDTH	mm ± 5	405	405	405
	LENGTH	mm ± 5	1015	1015	1015
	THICKNESS	mm ± 0,3	3 – 29	3 – 29	3 – 10

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(2): The values above are based on measurements on specimen of sandwich panels made by 3D|CORE. These panels were produced with an Epoxy system and Vacuum Injection technology. These values can differ depending on the manufacturing process. Please use the above values only as an indication for your analysis and please provide your own measurements. Specimen thickness of 20mm. (NH\_22.01.2021)

Hybrid means foam core and structure filled with Epoxy resin.

(3): Tolerances +/-7 kg/m<sup>3</sup>

### STRUCTURE

HX: HEXAGON

### RESIN UPTAKE STRUCTURE HX (VACUUM INFUSION):

50g/m<sup>2</sup>/mm

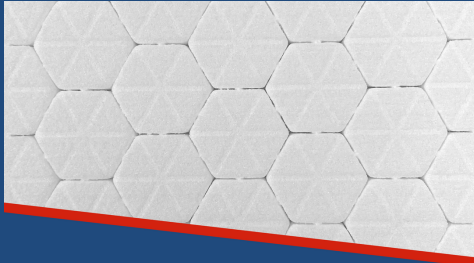
The resin uptake depends on the process as well. Please only use this formula as an indication value.

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# 3D|CORE™ PET FR

## PROPERTIES AND TECHNICAL DATA

Status: 01.02.2021



The 3D|CORE™ PET FR is a closed-cell, thermoplastic and recyclable rigid foam with excellent fire retardant, self-extinguishable properties according to EN 45545-2 and IMO 2010 FTP Code Part 5. The honeycomb structure provides more flexibility and is easy to handle.

The core is applicable with all known resin systems and processes.

### PROPERTIES

- Very good FST properties (fire, smoke, toxicity)
- Excellent fatigue resistance
- Excellent long-term thermal stability up to 100°C
- Very high processing temperature up to 180°C
- Closed-cell foam (no water absorption, no re-expansion, no outgassing)
- Easy processing with all known resin systems and processes
- Very high chemical resistance
- Homogenous connection of all components
- Excellent surface adhesion (connection between the surfaces and core)
- Highly consistent material properties
- Good thermal insulation
- Integrated flow mesh

### APPLICATION

- Rail and road vehicles: roofs, floor panels, interior, front masks, side panels
- Ship and boat building: hull, deck, mast, superstructures, interior, keel
- Industrial components: container, covers, safety doors, sleeves, sport equipment
- Architecture and Construction: roofs, walls, panels
- Automotive: underbody protection, battery box, trunk plate, chassis

### PROCESSING

- Hand lay-up
- Vacuum Infusion
- Vacuum Assisted RTM (VARTM, LRTM and HP-RTM)
- Wet pressing
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# 3D|CORE™ PET FR

## TECHNICAL DATA

Status: 01.02.2021

			FOAM TYPE	PET FR 95
			STRUCTURE	HX
DENSITY		kg/m³	3D CORE™ FOAM <sup>(1)</sup>	95 <sup>(3)</sup>
SHEAR MODULUS	ASTM C 273	MPa	3D CORE™ FOAM <sup>(1)</sup>	9
			3D CORE™ HYBRID <sup>2</sup>	58
SHEAR STRENGTH	ASTM C 273	MPa	3D CORE™ FOAM <sup>(1)</sup>	0,5
			3D CORE™ HYBRID <sup>2</sup>	1,02
COMPRESSION MODULUS	ISO 844:2014	MPa	3D CORE™ FOAM <sup>(1)</sup>	15
			3D CORE™ HYBRID <sup>2</sup>	184
COMPRESSION STRENGTH	ISO 844:2014	MPa	3D CORE™ FOAM <sup>(1)</sup>	0,4
			3D CORE™ HYBRID <sup>2</sup>	5,1
THERMAL CONDUCTIVITY	at 23°C	W/mK	3D CORE™ FOAM <sup>(1)</sup>	0,029
PERMITTIVITY	Frequency in GHz 5-10	ε	3D CORE™ FOAM <sup>(1)</sup>	1,63 – 1,64
MAX. PROCESSING TEMPERATURE		°C		180

MEASUREMENTS STANDARD SHEETS	WIDTH	mm ± 5		405
	LENGTH	mm ± 5		1015
	THICKNESS	mm ± 0,3		3-29

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Hybrid means foam core and structure filled with Epoxy resin.

(3): Tolerances +/-7 kg/m³

### STRUCTURE

HX: HEXAGON

### RESIN UPTAKE STRUCTURE HX (VACUUM INFUSION):

50g/m²/mm

The resin uptake depends on the process as well. Please only use this formula as an indication value.

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