GAUGLER & LUTZ

Product overview

Your competent partner for lightweight and sandwich construction

Expertise from over 30 years of experience in the market

PEELCORE®

MULTISHAPE®

Gaugler & Lutz

Your partner for preassembled components made in lightweight and sandwich construction

Dear customers, dear business partners,

We would like to present to you materials for future-oriented concepts and innovative ideas for the more effective use of energy that will make life safer and more comfortable and make manufacturing processes more economical.

This product overview gives you an array of technical data, material properties and application areas for every material from our range.

Should you require additional information we would be happy to send you processing guidelines, test certificates and further technical data.

Our sales team, both in-house and in the field, can be contacted at all times under the telephone number +49 7367 9666-555 or via e-mail at angebot@gaugler-lutz.de.

Best regards

Roland Lutz

Automotive industry | Road and rail | Wind energy | Recreation

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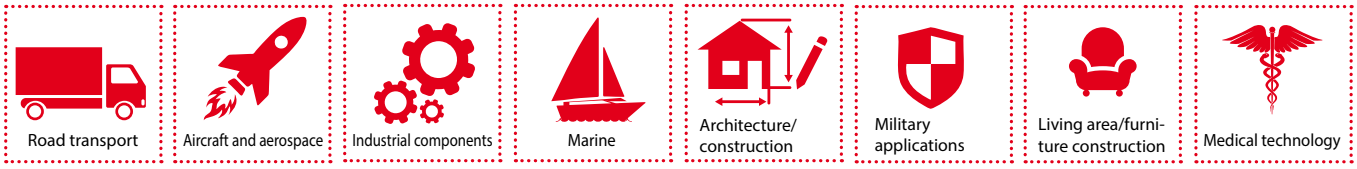


Certificates

The high quality standard of Gaugler & Lutz is founded on a quality management system (QM system) certified according to DIN EN ISO 9001.2015.

Our QM system is kept alive by the participation of our employees, who are assisted in complying with the quality assurance measures through thorough training and instruction. The focus is on meeting our customer's requirements whilst observing the need for economic and sustainable working methods.

Market segments

There are virtually no limits to the use of lightweight construction materials.
We are happy to assist you in choosing the right material for your particular application.

Road & Rail

The use of our core materials in road, rail and passenger transport reduces fuel consumption whilst increasing the vehicle payload and range at the same time.

Marine

Our core materials meet the particularly stringent requirements found in the marine and shipbuilding sectors. Outstanding fatigue, pressure and thrust properties make them suitable for many components in this field.

Aerospace

Due to the high requirements of the aircraft and aerospace industry, the basic conditions for the use of lightweight construction are clearly defined. Our materials provide tremendous weight savings that lead to maximized airflow and minimized fuel costs.

Light and easy.

Company profile

Headquartered in Aalen-Ebnat, Gaugler & Lutz has been the leading provider of preassembled core materials and complementary accessories for lightweight and sandwich construction since 1983. The product range is rounded off with sports, rehabilitation & leisure products from the softX® brand and the Swiss brand AIREX®.

The owner-run family business was founded as a small craft and commercial enterprise. Today Gaugler & Lutz is an industrial service provider with a comprehensive range of products, production and services arising from its policy of sustainable management and continuous investment and expansion.

The first-class product quality is ensured through certified quality management and selected suppliers as well as an in-house, state-of-the-art laboratory.

Our comprehensive machine park and associated production processes are flexible, scalable and redundant. A wide range of possibilities is available for material processing. Custom components can be produced to the customer's requirements by forming, separating, joining, coating or changing material properties. If desired the combination of production processes and production techniques poses no problem.

Whether individual, serial or mass production, Gaugler & Lutz offers a package tailored to the customer's requirements enabling the shortest delivery times and the highest quality at a reasonable price level.

Industry

The versatility of our materials means that their use is rarely limited. Structural and forming components with preassembled core materials can be used in almost all areas of the industry.

Special segments

The specific requirements that our customers have in fields such as (interior) architecture, construction, medical and much more could not be more diverse. Excellent mechanical properties combined with versatile pre-assembly options make our products the true all-rounders.

Sandwich construction

A combination of the best properties.

Today sandwich construction offers the ideal solution for creating light, stable structures in the fields of transport, leisure, sports articles, architecture and almost all sectors of industry.

The significant weight reduction enables savings in the consumption of fossil fuels, reducing cost and contributing to environmental protection.

The sandwich structure consists of a supporting material (for example rigid foam) forming the sandwich core and two high-strength outer layers. The outer layers can be made of laminates; these are fibre composites made of fibre, either woven or non-woven, or a bedding mass (matrix) such as epoxy resin.

In this compound structure the foam serves as a spacer and a transmitter of the thrust forces generated by loads. Besides achieving an excellent weight to rigidity ratio, the sandwich structure also offers a wealth of other benefits and options such as thermal and acoustic insulation, increased fire protection, function integration, large self-supporting components, impact resistance, corrosion resistance and much more.

Our core materials have acquired varied approvals and test certificates for marine, aeronautics, applications requiring enhanced fire protection (such as in public buildings) and for many other diverse requirements; please enquire about the material that you need.

The correct selection and application of the core materials will enable you to create a component that is best suited to your requirements in both the technical and commercial sense.

UPPER OUTER LAYER

We are also experts in regard to the pre-assembly of your components. Whether for single-unit manufacture or serial pre-assembly, we tailor the production exactly to your processes depending on the number of pieces to be produced and on the forming of your part. The custom solution that we provide will enable efficient further processing. Benefit from the enhanced process reliability and reproducibility of your parts. We will prepare an individual offer based on CAD data, a sample, a template or an on-site examination. We are laser focused on bringing our customers the highest quality and time and cost savings.

Our redundant machine park and our large storage areas enable us to provide the maximum flexibility and optimum material supply to our customers. The real-time production planning and control enables an immediate response to any change requests and guarantees short delivery times.

CORE MATERIALS CAPABLE OF ABSORBING AND TRANSMITTING THRUST FORCES.

LIGHTWEIGHT CORE

LOWER OUTER LAYER

Our expertise is your benefit.

With our own state-of-the-art laboratory and high-quality application technology, we offer the ideal environment for a development partnership. Our expertise gained over a period of 30 years on the market enables us to stand by your side to jointly develop innovative solutions. Long-term synergy effects and enhanced fields of competence will provide you with a real competitive advantage.

Develop pre-assembled components in cooperation with Gaugler & Lutz

Do you have an idea? We will work with you to develop the right solution.
You profit from our pre-assembled components in every way.

1 Our specialized manufacturing capabilities enable effective component production.

2 The materials preassembled to your specification are ready-to-use and can then undergo further processing.

3 Our measures for waste reduction and production optimisation bring you cost savings and make your handling effort easier.

4 The support we provide means that you always have a partner to answer your technical, logistical and commercial questions.

Your idea

Consulting/Material processing/ Material selection/Development

Your specific lightweight part

PROFILES FOR ANY APPLICATION, E.G. FOR WINDOW CONSTRUCTION

AIREX T10

Easy processing structural foam

Description

AIREX T10 is a closed-cell, thermoplastic and recyclable polymer foam with a very homogeneous cell structure, high mechanical properties and an outstanding price/performance ratio. It has an extraordinary resistance to fatigue, is chemically stable, UV-resistant and has negligible water absorption. T10 is thermally stable, can also be worked and hardened at elevated temperatures and shows no post-expansion or out-gassing. As an easy-to-process rigid foam, it can be used with all common resins and manufacturing processes. AIREX T10 is ideally suited for high volume applications of lightweight sandwich structures subjected to static and dynamic loads and/or exposed to elevated temperatures during manufacturing.

Applications

Road transport: Structural and semi-structural applications on the interior and exterior of side walls, floors, box bodies and covers. **Wind energy:** Rotor blades (spars & shells) and gondolas. **Marine:** Hull, deck, superstructures, rear end, bulkheads, ribs. **Industrial components:** Covers, containers, x-ray machines, sports equipment.

Characteristics

Very high compressive and shear properties, excellent fatigue strength, homogeneous, uniform cell structure, hardly inflammable in accordance to DIN 4102, easy processing with all resins and laminating processes, very high processing temperature up to 150 °C, excellent long-term thermostability up to 100 °C, good outer layer adhesion (bond outer layer to core), recyclable and recycled material, highly consistent material properties, no water absorption, no post-expansion and no out-gassing.

Processing

Manual lamination/fibre spraying, vacuum infusion/injection, resin infusion/injection (VARTM/RTM), adhesive bonding, pressing (GMT, SMT etc.), thermoforming.

Properties	Test standard	Unit	Value [1]	T10.100	T10.110
Density	ISO 845	kg/m³	Average	100 93 - 107	110 103 - 117
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average	1.2 0.9	1.6 1.0
Compressive modulus perpendicular to the plane	DIN 53421	N/mm²	Average	110 90	120 100
Tensile strength perpendicular to the plane	ASTM C297	N/mm²	Average	2.0 1.5	2.3 1.8
Tensile modulus perpendicular to the plane	ASTM C297	N/mm²	Average	150 125	165 140
Longitudinal shear strength	ISO 1922	N/mm²	Average	1.1 0.9	1.15 0.95
Transverse shear strength	ISO 1922	N/mm²	Average	0.8 0.73	0.9 0.78
Longitudinal shear modulus	ISO 1922	N/mm²	Average	34 29	38 32
Transverse shear modulus	ISO 1922	N/mm²	Average	17.5 16	22 19
Shear fracture elongation	ISO 1922	%	Average	20 15	20 15
Thermal conductivity at room temperature	ISO 8301	W/m.K	Average	tbd	tbd
Standard sheet					
Width		mm ± 5		1005	1005
Length [2]		mm ± 5		2440	2440
Thickness		mm ± 0.5		5 to 45	5 to 45

Finishing options, other sizes and tighter tolerances on request [1] Minimum values according to DNV definition; Test specimen thickness 20 mm except pressure module (40 mm) 2) Alternative lengths on request

AIREX SealX - T90

PET structural foam with sealed surfaces | Perfect for bulk densities up to 130 kg / m² | Designed for resin infusions | Significant reduction of resin absorption during infusion processes | Significant weight and cost reduction

IN FOCUS: FIRE BEHAVIOUR!

AIREX T90

Easy processing FST structural foam

Description

AIREX T90 is a closed-cell thermoplastic polymer foam that is outstanding for laminating with all types of resins and processes. The manufacturing process achieves a structural core material with very constant properties. T90 is easy to machine and for thermoforming. Good compressive strength and improved pressure module enable inserts in a variety of sandwich constructions. T90 is ideally suited for for use in areas subject to high fire protection requirements because of its high temperature resistance and excellent fire resistance. The rigid foam is chemically stable, UV-resistant and has negligible water absorption. Curing and post-curing at elevated temperatures is not a problem as T90 is thermally very stable and does not post-expand.

Applications

Wind energy: Rotor blades and spars. **Marine:** Rear end, covers, local reinforcement, interior finishing, engine covers, bulkheads. **Road and rail:** Floor panels, side walls, interior finish, engine cover, roofs. **Industrial components:** Covers, containers, local reinforcements, sports.

Characteristics

Very good fire retardant properties (FAR 25.853, NF F16-101, DIN 5510; DIN 4102; EN 13501), very good fatigue strength, easy processing with all resins and laminating processes, excellent long-term thermostability up to 100 °C, very high processing temperature up to 150 °C, high compressive strength and high pressure module, very low scattering in the mechanical values, good outer layer adhesion (bond outer layer to core), excellent chemical resistance, no water absorption, no post-expansion.

Processing

Manual lamination/fibre spraying, vacuum infusion/injection, resin infusion/injection (VARTM/RTM), adhesive bonding, pressing (GMT, SMT), can be thermoformed.

Properties	Test standard	Unit	Value [1]	T90.60	T90.100	T90.150	T90.210
Density	ISO 845	kg/m³	Average Type Range	65 60 - 70	110 105 - 115	145 140 - 150	210 200 - 220
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average Minimum	0.80 0.7	1.4 1.2	2.2 2	3.8 3.2
Compressive modulus perpendicular to the plane	ISO 844	N/mm²	Average Minimum	50 35	80 70	105 95	170 145
Tensile strength perpendicular to the plane	ASTM C297	N/mm²	Average Minimum	1.5 1.2	2.2 1.6	2.7 2.2	3.0 2.4
Tensile modulus perpendicular to the plane	ASTM C297	N/mm²	Average Minimum	85 70	120 90	170 140	225 180
Shear strength	ISO 1922	N/mm²	Average Minimum	0.46 0.4	0.8 0.7	1.2 1.1	1.85 1.5
Shear modulus	ISO 1922	N/mm²	Average Minimum	12 10.5	20 18	30 26	50 44
Shear fracture elongation	ISO 1922	%	Average Minimum	25 15	10 5	8 4	5 3
Thermal conductivity at 10°C	ISO 8301	W/m.K	Average	0.037	0.035	0.038	0.045
Standard sheet							
Width		mm ± 5		1220	1220	1220	1220
Length		mm ± 5		2440	2440	2440	2440
Thickness		mm ± 0.5		5 to 100	5 to 100	5 to 100	5 to 100

Finishing options, other sizes and tighter tolerances on request [1] Minimum values according to DNV definition; Test specimen thickness 20 mm except pressure module (40 mm)

AIREX T92

Easy processing structural foam

Description

AIREX T92 is a closed-cell thermoplastic polymer foam that is outstanding for laminating with all types of resins and processes. The Airex®T92 manufacturing process achieves a structural core material with very constant properties. The considerably improved shear elongation/damage tolerance enables T92 to be used in most structural sandwich constructions. The foam is mechanically very easy to machine, can be thermoformed and is thermally very stable. It is chemically very stable, does not absorb water and exhibits no post-expansion.

Applications

Wind energy: Rotor blades (spars & shells) and gondolas. **Marine:** Hull, deck, superstructures, rear end, bulkheads, ribs. **Industrial components:** Covers, containers, local reinforcements, x-ray tables, sports.

Characteristics

Easy processing with all resins and laminating processes, very high processing temperature up to 150 °C, high compressive strength and shear properties, very low scattering in the mechanical values, excellent chemical resistance, normally inflammable in accordance to DIN 4102, good outer layer adhesion (bond outer layer to core), excellent long-term thermostability up to 100 °C, no water absorption, no post-expansion.

Processing

Manual lamination/fibre spraying, vacuum infusion/injection, resin infusion/injection (VARTM/RTM), adhesive bonding, pressing (GMT, SMT etc.), thermoforming.

AIREX SealX - T92

PET structural foam with sealed surfaces | Perfect for bulk densities up to 130 kg/m² | Designed for resin infusions | Significant reduction of resin absorption during infusion processes | Significant weight and cost reduction

NOW WITH IMPROVED SHEAR VALUES!

Properties	Test standard	Unit	Value [1]	T92.60	T92.80	T92.100	T92.130	T92.200	T92.320
Nominal density	ISO 845	kg/m³	Average Type Range	65 60 - 70	85 80 - 90	100 95 - 105	135 127 - 143	210 200 - 220	320 310 - 330
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average Minimum	0.85 0.75	1.3 1.1	1.75 1.4	2.4 2.1	3.8 3.2	7.1 6.5
Compressive modulus perpendicular to the plane	DIN 53421	N/mm²	Average Minimum	55 45	75 60	90 65	140 110	180 150	280 240
Tensile strength perpendicular to the plane	ASTM C297	N/mm²	Average Minimum	1.3 1.2	1.9 1.4	2.3 1.5	2.6 2.0	3.1 2.5	4.5
Tensile modulus perpendicular to the plane	ASTM C297	N/mm²	Average Minimum	85 75	90 80	110 90	175 130	230 190	420
Shear strength	ISO 1922	N/mm²	Average Minimum	0.55 0.46	0.72 0.65	0.9 0.75	1.3 1.1	2.0 1.6	3.5 3.0
Shear modulus **Parallel to the weld seam** **Across the weld seam** **Across the weld seam**	ISO 1922	N/mm²	Average Average Minimum	15 14 12	22 19.5 16	26 23 19	34 30 25	55 50 45	110 110 90
Shear fracture elongation	ISO 1922	%	Average Minimum	25 15	30 20	20 10	12 8	6 4	5 3
Thermal conductivity at 10 °C	EN 12667	W/m.K.	Average	0.037	0.030	0.034	0.037	0.045	0.066
Standard sheet									
Width		mm ± 5		1220	1220	1220	1220	1220	1220
Length		mm ± 5		2440	2440	2440	2440	2440	2440
Thickness		mm ± 0.5		5 to 100	5 to 100	5 to 100	5 to 100	5 to 100	5 to 50

Finishing options, other sizes and tighter tolerances on request [1] Minimum values according to DNV definition

Properties	Test standard	Unit	C51.60
Nominal density	ISO 845	kg/m³	60
Compressive strength perpendicular to the plane	ISO 844	N/mm²	0.45
Pressure module perpendicular to the plane	DIN 53421	N/mm²	25
Tensile strength in the plane	ISO 527 1-2	N/mm²	0.55
Tensile modulus in the plane	ISO 527 1-2	N/mm²	10
Shear strength	ISO 1922	N/mm²	0.45
Shear modulus	ASTM C 393	N/mm²	5.0
Shear fracture elongation	ISO 1922	%	30
Thermal conductivity at room temperature	ISO 8301	W/m.K.	0.036
Standard sheet			
Width		mm ± 10	1200
Length		mm ± 10	2500
Thickness		mm ± 1.0	10 to 20
Color			off-white

Other dimensions on request

AIREX C51

Industrial Processing Foam

Description

AIREX T10 is a closed-cell, thermoplastic rigid foam intended for use in industrial, large volume sandwich parts. The surface perforations guarantee good adhesion to the laminate. The foam has good shear elongation properties and also stands out for its good impact resistance and fatigue strength. At room temperature it can be processes to simple structures and through thermoforming to complex 3 dimensional structures. The increased temperature resistance enables short cycle manufacturing processes with hardening resins or thermoplastic fibre reinforced skins (GMT). The ridged foam is suitable as core material for statically or dynamically loaded sandwich products in serial production.

Applications

Road and rail: Car bodies, headliners, deflectors, spoilers, seats, truck panels, side skirts. **Wind energy**: Turbine generator housings. **Industrial components:** Containers, shelters, covers.

Characteristics

High impact resistance (no brittle fracture properties), increased short-term heat resistance, can be cold or hot formed to 3 dimensional structures, low resin absorption, good sound and thermal insulation.

Processing

Manual lamination/fibre spraying, GMT processes, thermoforming, infusion, resin injection (RTM) adhesive bonding.

AIREX C71

Temperature-resistant structural foam

Description

AIREX C71 is a closed-cell, cross-linked polymer foam with high temperature resistance, high rigidity and a very good strength to weight ratio. It is extremely tough, has negligible water absorption, and provides a good resistance to chemicals. Compatible with most resins and manufacturing processes The fine cell structure offers an excellent bonding surface of the cover layers. It is the ideal core material for light, dynamically or statically loaded sandwich structures that are subject to high temperatures.

Applications

Wind energy: Rotor blades, nacelles, turbine generator housings. **Road and rail:** Roof panels, interiors, floors, doors, partition walls, side skirts, front-ends. **Marine:** Hulls, decks, bulkheads, superstructures, engine covers. **Aircraft and aerospace:** Interiors, radomes, galley carts, fuselage and wing parts for sports aircraft. **Recreation:** Skis, snowboards, wakeboards, canoes, kayaks. **Industrial components:** Tooling, tanks, ductwork, containers, covers.

Characteristics

Retains stiffness and strength at increased temperature, dimensionally stable, low resign absorption (fine cell structure), favourable fire behaviour (self-extinguishing), good sound and thermal insulation, styrene compatibility.

Processing

Manual lamination/fibre spraying, resin injection (RTM), gluing, prepreg processing (up to 140 °C, 285 °F), vacuum infusion, thermoforming.

Properties	Test standard	Unit	Value [1]	C71.55	C71.75
Density	ISO 845	kg/m³	Average Type Range	60 54 - 69	80 72 - 92
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average Minimum	0.95 0.85	1.5 1.3
Compressive modulus perpendicular to the plane	DIN 53421	N/mm²	Average Minimum	70 60	102 85
Tensile strength in the plane	ISO 527 1-2	N/mm²	Average Minimum	1.5 1.0	2.2 1.4
Tensile modulus in the plane	ISO 527 1-2	N/mm²	Average Minimum	42 30	60 40
Shear strength	ISO 1922	N/mm²	Average Minimum	0.93 0.70	1.35 1.10
Shear modulus	ASTM C393	N/mm²	Average Minimum	21.5 18	30 25
Shear fracture elongation	ISO 1922	%	Average Minimum	25 15	32 20
Thermal conductivity at room temperature	ISO 8301	W/m.K.	Average	0.031	0.036
Standard sheet					
Width		mm ± 5		1120	1005
Length		mm ± 5		2400	2150
Thickness		mm ± 0.5		5 to 70	3 to 70
Color				light red	light yellow

Finishing options, other sizes and tighter tolerances on request [1] Minimum values according to DNV definition; Test specimen thickness 20 mm except tensile properties (10mm) and pressure module (40 mm)

AIREX C70

Temperature-resistant structural foam

Description

AIREX C70 is a closed-cell, cross-linked polymer foam with high rigidity and a very good strength to weight ratio. It is non-friable, has negligible water absorption, and provides an excellent resistance to chemicals. Compatible with most resins and manufacturing processes. The fine cell structure offers an excellent bonding surface of the cover layers. It is ideally suited as a core material for a wide variety of sandwich structures subjected to both static and dynamic loads.

Applications

Marine: Hulls, decks, bulkheads, superstructures, interiors. **Road and rail:** Roof panels, interiors, floors, doors, interiors, partition walls, side skirts. **Wind energy:** Rotor blades, nacelles, turbine generator housings. **Aircraft and aerospace:** Fuselage and wing parts for sport aircraft, galley carts. **Recreation:** Surfboards, snowboards, wakeboards. **Industrial components:** Tooling, tanks, ductwork, containers, covers.

Characteristics

High strength and rigidity with low weight, good impact resistance, low resin absorption, good fatigue resistance, favourable fire behaviour, self-extinguishing, good sound and thermal insulation, does not decompose, good styrene compatibility.

Processing

Manual lamination/fibre spraying, vacuum infusion, resin injection (RTM), gluing, thermoforming.

Properties	Test standard	Unit	Value [1]	C70.40	C70.48	C70.55	C70.75	C70.90	C70.130	C70.200	C70.250
Nominal density	ISO 845	kg/m³	Average Type Range	40	48 43-55	60 54-69	80 72-92	100 90-115	130 120-150	200 180-250	250 225-288
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average Minimum	0.45	0.60 0.50	0.90 0.75	1.45 1.10	2.0 1.7	3.0 2.6	5.2 4.5	6.6 5.3
Compressive modulus perpendicular to the plane	DIN 53421	N/mm²	Average Minimum	41	48 35	69 55	104 80	130 110	170 145	280 240	350 280
Tensile strength in the plane	ISO 527 1-2	N/mm²	Average Minimum	0.70	0.95 0.8	1.3 1.0	2.0 1.6	2.7 2.2	4.0 3.0	6.0 4.8	7.5 5.5
Tensile modulus in the plane	ISO 527 1-2	N/mm²	Average Minimum	28	35 28	45 35	66 50	84 65	115 95	175 140	230 160
Shear strength	ISO 1922	N/mm²	Average Minimum	0.45	0.55 0.50	0.85 0.70	1.2 1.0	1.7 1.4	2.4 2.1	3.5 3.2	4.7 3.8
Shear modulus	ASTM C393	N/mm²	Average Minimum	13	16 14	22 18	30 24	40 34	54 45	75 68	95 78
Shear fracture elongation	ISO 1922	%	Average Minimum	8	10 8	16 10	18 10	23 12	30 20	30 20	30 20
Thermal conductivity at room temperature	ISO 8301	W/m.K	Average	0.031	0.031	0.031	0.033	0.035	0.039	0.048	0.056
Standard sheet											
Width		mm ± 5		1330	1270	1150	1020	950	850	750	700
Length		mm ± 5		2850[2]	2730[2]	2450[2]	2180	2050	1900	1600	1500
Thickness		mm ± 0.5		5 to 80	5 to 70	5 to 70	3 to 68	3 to 60	5 to 50	5 to 40	5 to 40
Color				light green	violet	yellow	green	red	blue	brown	green

Finishing options, other sizes and tighter tolerances on request [1] Minimum values according to DNV definition; Test specimen thickness 20 mm except tensile properties (10 mm) and pressure module (40 mm) [2] half sheet size for thicknesses ≤ 8mm

AIREX® R63*

Damage tolerant structural foam

Description

AIREX R63 is a closed-cell, linear, thermoplastic polymer foam with extremely high damage tolerance. AIREX R63 combines very high elongation and allows an excellent bond strength. Can be formed into simple 3 dimensional geometries without heat. Excellent core material for dynamically loaded and impact absorbing sandwich structures.

Applications

Marine: Hull, floor and side walls. **Road and rail:** Front-ends, side skirts, crash belts. **Aircraft and aerospace:** Explosion proof cargo containers. **Recreation:** Surf boards, canoes, kayaks. **Industrial components:** Containers, shelters, helmets.

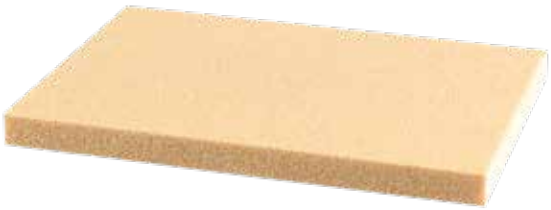
Characteristics

Extremely impact resistant (no brittle fracture properties), excellent thermoformability (cold and hot), dimensionally stable, very good fatigue properties, excellent adhesion, does not decompose, good sound and thermal insulation.

Processing

Manual lamination/fibre spraying, gluing, thermoforming, vacuum infusion.

*product expires. Limited availability.



Properties	Test standard	Unit	Value [1]	R63.50	R63.80	R63.140
Density	ISO 845	kg/m³	Average Type Range	60	90 80 - 120	140 125 - 170
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average Minimum	0.38	0.90 0.70	1.6 1.3
Compressive modulus perpendicular to the plane	DIN 53421	N/mm²	Average Minimum	30	56 46	110 100
Tensile strength in the plane	ISO 527 1-2	N/mm²	Average Minimum	0.90	1.4 1.2	2.4 2.2
Tensile modulus in the plane	ISO 527 1-2	N/mm²	Average Minimum	30	50 45	90 80
Shear strength	ISO 1922	N/mm²	Average Minimum	0.50	1.0 0.8	1.85 1.60
Shear modulus	ASTM C393	N/mm²	Average Minimum	11	21 18	37 35
Shear fracture elongation	ISO 1922	%	Average Minimum	70	75 70	80 75
Impact strength	DIN 53453	kJ/mD²	Average	4.0	5.0	6.5
Thermal conductivity at room temperature	ISO 8301	W/m.K.	Average	0.034	0.037	0.039
Standard sheet						
Width		mm ± 5		1300 to 1400	1200 [2]	1050 [2]
Length		mm ± 5		2900 to 3100	2700 [2]	2400 [2]
Thickness		mm ± 0.5		5 to 50	3 to 30 [3]	3 to 20 [3]
Color				brownish yellow	brownish yellow	brownish yellow

Finishing options, other sizes and tighter tolerances on request [1] Minimum values according to DNV definition; Test specimen thickness 20 mm except tensile and impact properties (10 mm) and pressure module (40 mm)
[2] Tolerance for 3-9 mm: +/- 10 mm, 3) Thicker sheets can be laminated

AIREX R82

High-performance structural foam with extremely high fire protection

Description

AIREX R82 is a thermoplastic rigid foam with very good fire resistance, low smoke and toxic development. The very good electrical properties, the excellent strength to weight ratio, the negligible water absorption and the high impact strength are other excellent properties. R82 is excellent for use in structural sandwich components that demand high fire resistance, radar transparency or operation in extremely hot or cold environments.

Applications

Aircraft and aerospace: Interiors, cockpit doors, low-temperature tanks, insulating covers, radomes, helicopter rotor blades, fuselage and wing parts for sports aircraft. **Road and rail:** Front-ends, side skirts, roof panels, interior. **Marine:** Fast ferries, fire-resistant interiors, radome. **Military applications:** Marine structures, antennas, communication facilities. **Industrial components:** Thermally stressed parts (-194 °C to 160 °C), radome, x-ray tables .

Characteristics

Fulfils most stringent fire requirements, operating temperature from -194 °C to +160 °C (-317 °F to +320 °F), remains ductile at cryogenic temperatures, low electrical loss factor, good radar transparency, good fatigue resistance, very high impact resistance (no brittle fracture behaviour) can be thermoformed, good sound and thermal insulation.

Processing

Manual lamination/fibre spraying, gluing, thermoforming, pre-preg processing (up to 180 °C, 355 °F).

Properties	Test standard	Unit	Value [1]	R82.60	R82.80	R82.110
Density	ISO 845	kg/m³	Average Type Range	60 54 - 69	80 72 - 95	110 99 - 126
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average Minimum	0.70 0.60	1.1 0.9	1.4 1.2
Pressure module perpendicular to the plane	DIN 53421	N/mm²	Average Minimum	46 40	62 56	83 60
Tensile strength in the plane	ISO 527 1-2	N/mm²	Average Minimum	1.7 1.2	2.0 1.7	2.2 1.9
Tensile modulus in the plane	ISO 527 1-2	N/mm²	Average Minimum	45 35	54 50	64 54
Shear strength	ISO 1922	N/mm²	Average Minimum	0.80 0.65	1.1 0.9	1.4 1.15
Shear modulus	ASTM C393	N/mm²	Average Minimum	18 15	23 20	30 25
Shear fracture elongation	ISO 1922	%	Average Minimum	25 15	23 15	18 10
Impact strength	DIN 53453	kJ/m²	Average	1.0	1.3	1.4
Thermal conductivity at room temperature	ISO 8301	W/m.K.	Average	0.036	0.037	0.040
Standard sheet						
Width		mm ± 5		1350	1200	1000
Length		mm ± 5		2800	2700	2300
Thickness		mm ± 0.5		3 to 60	3 to 60	5 to 30
Color				off-white	off-white	off-white

Finishing options, other sizes and tighter tolerances on request [1] Minimum values according to DNV definition; Test specimen thickness 20 mm except tensile and impact properties (10 mm) and pressure module (40 mm)

ROHACELL® IG

high thermal and solvent resistance, for pre-preg, vacuum infusion and RTM processes, low thermal conductivity at low temperatures

ROHACELL® IG-F

Properties as for Rohacell® IG, less resin absorption, therefore better radiant transparency, for pre-preg, vacuum infusion and RTM processes

Property	Test Method	Unit	ROHACELL® 31 IG/IG-F	ROHACELL® 51 IG/IG-F	ROHACELL® 71 IG/IG-F	ROHACELL® 110 IG/IG-F
Nominal density	*	kg/m³ lbs/ft³	32 ± 7 2.00 ± 0.44	52 ± 12 3.25 ± 0.75	75 ± 15 4.68 ± 0.94	110 ± 21 6.87 ± 1.31
Compressive Strength	ISO 844	MPa psi	0.4 58	0.9 130	1.5 217	3.0 435
Compressive Modulus	ISO 844	MPa psi	17 2,470	43 6,240	73 10,600	120 17,400
Tensile Strength	ISO 527-2	MPa psi	1.0 145	1.9 275	2.8 406	3.5 507
Tensile Modulus	ISO 527-2	MPa psi	36 5,220	70 10,150	92 13,340	160 23,200
Shear Strength	DIN 53294	MPa psi	0.4 58	0.8 116	1.3 188	2.4 348
Shear Modulus	DIN 53294	MPa psi	13 1,885	19 2,755	29 4,205	50 7,250
Coefficient of Thermal Expansion		1/K*10E-5	5.03	4.71	3.81	3.04
Flexural strength	ISO 1209	MPa	0.8	1.6	2.5	4.5
Thermoforming resistance	DIN 53424	°C	180	180	180	180
Standard sheet IG-F						
Thickness*		mm	4 up to 85	1 up to 70	4 up to 60	4 up to 45
Length x Width		mm	L 2500 x 1250	L 2500 x 1250	L 2500 x 1250	2160 x 1100
Special formats on request, e.g.		mm	S 1250 x 625 M 1250 x 1250	S 1250 x 625 M 1250 x 1250	S 1250 x 625 M 1250 x 1250	
Standard sheet IG		mm	L 2500 x 1250	L 2500 x 1250	L 2500 x 1250	2160 x 1100

**other thicknesses on request.*

ROHACELL®

Closed-cell PMI rigid foam

The high-quality structural foam allows for innovative solutions and a highly efficient production process.

- excellent mechanical strength
- homogeneous cell structures/isotropic properties
- minimizes production times and costs
- low density
- high thermal stability
- versatile
- ultra light
- powerful
- thermoformable
- can be used in an autoclave

ROHACELL® HF

low dielectric constant, for manual insertion process, pre-preg and vacuum infusion process, extremely fine cells and structures, minimum resin absorption, problem-free compatibility with metallic coating materials.

Property	Test Method	Unit	ROHACELL® 31 HF	ROHACELL® 51 HF	ROHACELL® 71 HF
Density	*	kg/m³ lbs/ft³	32 ± 7 2.00 ± 0.44	52 ± 12 3.25 ± 0.75	75 ± 15 4.68 ± 0.94
Compressive Strength	ISO 844	MPa psi	0.4 58	0.9 130	1.5 217
Tensile Strength	ISO 527-2	MPa psi	1.0 145	1.9 275	2.8 406
Tensile Modulus	ISO 527-2	MPa psi	36 5,220	70 10,150	92 13,340
Elongation at Break	ISO 527-2	%	3.5	4.0	4.5
Shear Strength	DIN 53294	MPa psi	0.4 58	0.8 116	1.3 188
Shear Modulus	DIN 53294	MPa psi	13 1,885	19 2,755	29 4,205
Coefficient of Thermal Expansion		1/K*10E-5	N/A	3.34	3.34

Electr. properties	Frequenz [GHz]	31 HF	51 HF	71 HF
Dielectric constant	2.5 5.0	1.050 1.043	1.057 1.065	1.075 1.106
	10.0 26.5	1.046 1.041	1.067 1.048	1.093 1.093
Dielectric loss	2.5 5.0	<0.0002 0.0016	<0.0002 0.0008	<0.0002 0.0016
	10.0 26.5	0.0017 0.0106	0.0041 0.0135	0.0038 0.0155

Thermoforming resistance	DIN 53424	°C	180	180	180
Standard sheet					
Thickness*		mm	4 up to 85	4 up to 70	4 up to 60
Length x Width		mm	2500 x 1250	2500 x 1250	2500 x 1250

**other thicknesses on request.*

ROHACELL® Rima

minimum resin absorption, for vacuum infusion and RTM processes, can be used as a lost core.

Property	Test Method	Unit	ROHACELL® 51 RIMA	ROHACELL® 71 RIMA	ROHACELL® 110 RIMA
Density	ISO 845	kg/m³ lbs/ft³	52 3.25	75 4.68	110 6.87
Compressive Strength	ISO 844	MPa psi	0.8 116	1.7 246	3.6 522
Tensile Strength	ISO 527-2	MPa psi	1.6 232	2.2 319	3.7 536
Tensile Modulus	ISO 527-2	MPa psi	75 10,875	105 15,225	180 26,100
Elongation at Break	ISO 527-2	%	7	7	7
Shear Strength	DIN 53294	MPa psi	0.8 116	1.3 188	2.4 348
Shear Modulus	DIN 53294	MPa psi	24 3,480	42 6,090	70 10,170
Coefficient of Thermal Expansion		1/K*10E-5	4.06	3.40	3.64
Thermoforming resistance	DIN 53424	°C	210	210	210
Standard sheet					
Thickness*		mm	4 up to 70	4 up to 60	4 up to 45
Length x Width		mm	S 1250 x 625 M 1250 x 1250 L 2500 x 1250	S 1250 x 625 M 1250 x 1250 L 2500 x 1250	2160 x 1100

**other thicknesses on request.*

Evonik Industries ©

ROHACELL® XT HT

XT-HT=thermoforming resistant core material for load-bearing sandwich structures, for autoclave, RTM and vacuum infusion processes, perfect for demanding processes at very high temperatures.

**HT - can also be applied in other ROHACELL® types. Contact our sales department*

Property	Test Method	Unit	ROHACELL® 71 XT-XT	ROHACELL® 110 XT-XT
Density	ISO 845	kg/m³ lbs/ft³	75 4.68	110 6.87
Compressive Strength	ISO 844	MPa psi	1.7 246	3.6 522
Tensile Strength	ISO 527-2	MPa psi	2.2 319	3.7 536
Tensile Modulus	ISO 527-2	MPa psi	105 15,220	180 26,100
Elongation at Break		%	4	4
Shear Strength	DIN 53294	MPa psi	1.4 203	2.1 304
Shear Modulus	DIN 53294	MPa psi	42 6,090	63 9,135
Thermoforming resistance	DIN 53424	°C	240	240
Standard sheet				
Thickness*		mm	4 up to 60	4 up to 45
Length x Width		mm	2500 x 1250	2160 x 1100

**other thicknesses on request.*

Applications

Racing, wind turbines: Rotor blades, nacelles, turbine generator housings. **Road and Rail:** Structural components, driving units **Marine:** Decks, bulkheads, superstructures **Medical technology:** X-ray benches, **Recreation:** Road racing bike construction

ROHACELL® S

Railway standards tested, Used mainly in railway construction, Pre-preg, vacuum infusion, RTM, VARTM processes.

Property	Test Method	Unit	ROHACELL® 51 S	ROHACELL® 71 S	ROHACELL® 110 S
Density	*	kg/m³ lbs/ft³	52 ± 12 3.25 ± 0.75	75 ± 15 4.68 ± 0.94	110 ± 21 6.87 ± 1.31
Compressive Strength	ISO 844	MPa psi	0.7 101	1.5 217	2.8 406
Tensile Strength	ISO 527-2	MPa psi	1.1 159	1.9 275	3.2 464
Tensile Modulus	ISO 527-2	MPa psi	50 7,250	90 13,050	150 21,750
Elongation at Break	ISO 527-2	%	3.5	3.5	3.5
Shear Strength	DIN 53294	MPa psi	0.6 87	1.2 174	2.2 319
Shear Modulus	DIN 53294	MPa psi	20 2,900	34 4,930	55 7,975
Thermoforming resistance	DIN 53424	°C	190	190	190
Fire behaviour	ASTM D 1692-59		self-extinguishing	self-extinguishing	self-extinguishing
	AFNOR NF 16-101		M1 / F2	M2 / F3	
	ASTM D 2863 (LOI)	%	23.8	23.2	
	UL 94		V - 2		
Standard sheet					
Thickness*		mm	4 up to 80	4 up to 80	4 up to 65
Length x Width		mm	2500 x 1250	2500 x 1250	2160 x 1100

**other thicknesses on request.*

ROHACELL® WF

for autoclave-, pre-preg and all typical vacuum infusion processes, increased processing temperatures.

Property	Test Method	Unit	ROHACELL® 51 WF	ROHACELL® 71 WF	ROHACELL® 110 WF	ROHACELL® 200 WF	ROHACELL® 300 WF
Density	ISO 845	kg/m³ lbs/ft³	52 3.25	75 4.68	110 6.87	205 12.8	300 18.7
Compressive Strength	ISO 844	MPa psi	0.8 116	1.7 246	3.6 522	9.0 1,305	17.8 2,580
Tensile Strength	ISO 527-2	MPa psi	1.6 232	2.2 319	3.7 536	6.8 986	12.0 1,740
Tensile Modulus	ISO 527-2	MPa psi	75 10,870	105 15,220	180 26,100	350 50,760	578 83,830
Elongation at Break	ISO 527-2	%	3.0	3.0	3.0	3.5	2.8
Shear Strength	DIN 53294	MPa psi	0.8 116	1.3 188	2.4 348	5.0 725	8.3 1,200
Shear Modulus	DIN 53294	MPa psi	24 3,480	42 6,090	70 10,150	150 21,750	364 52,790
Coefficient of Thermal Expansion		1/K*10E-5	3.11	3.09	3.07	3.76	3.50
Thermoforming resistance	DIN 53424	°C	205	200	200		
Standard sheet							
Thickness*		mm	4 up to 130	4 up to 125	4 up to 100		
Length x Width		mm	2500 x 1250	2500 x 1250	2160 x 1100		

**other thicknesses on request.*

Polyurethan-Hartschaum®

without outer layer

Description

Polyurethane is a CFC-free PUR rigid foam block with excellent insulating properties. It is a cross-linked thermoset plastic that does not melt. The application temperature is between -80 °C and 130 °C.

Properties

Closed-cell structure foam, voluminous block foam, good thermal insulation, good mechanical processing, available in low density with increased fire protection.

Applications

Vehicle construction: Caravan body structures. **Industrial applications:** Isolation tanks, containers, model and mould construction.

Properties	Test standard	Unit	PUR RG 30	PUR RG 40	PUR RG 50	PUR RG 60	PUR RG 80	PUR RG 100	PUR RG 145	PUR RG 200
Nominal density	EN 1602	kg/m³	33	40	50	60	80	100	145	200
Fire behaviour	EN 13501-1	Class	E	E	E	E	E	E	E	E
Thermal conductivity	EN 12667	W/mK	≤ 0.022	≤ 0.022	≤ 0.022	≤ 0.023	≤ 0.024	≤ 0.025	≤ 0.030	≤ 0.038
Compressive strength at 10% compression	EN 826	kPa	270	320	400	500	750	1,100	2,000	3,500
Tensile modulus of the compressive strength	EN 826	kPa	7,000	8,500	11,000	15,000	22,000	35,000	55,000	100,000
Tensile strength perpendicular to the plane	EN 1607	kPa	350	400	500	650	900	1,200	1,500	2,000
Flexural strength	EN 12089	kPa	320	350	550	700	1,100	1,600	2,500	4,000
Water absorption when shortly submerged	EN 1609	%	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3
Closed cell content	EN ISO 4590	%	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90	≥ 90
Continuous operating temperature	-	°C	-70 / +130	-70 / +130	-70 / +130	-70 / +130	-70 / +130	-70 / +130	-70 / +130	-70 / +130

LEOcore®

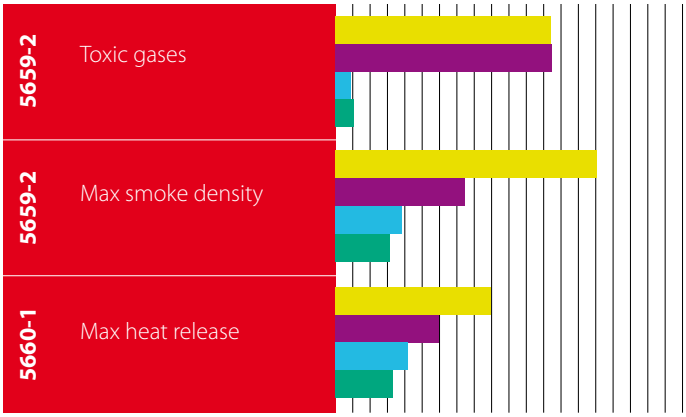
Fulfils DIN EN 45545* and DIN SPEC 91326 description

** Only in conjunction with other LEO products. Does not replace the individual fire protection tests.*

- Simple processing in the RTM and the infusion processes
- No water absorption
- Processing temperature up to 150 °C
- Best fatigue values
- High chemical resistance
- Excellent fire characteristics such as DIN EN 45545* and DIN EN13501-B
- Available in different versions

Applications

Road and rail: Floor panels, side walls, interior finish, air-conditioning channels, engine cover, roofs, underlay, train fronts, skirts. **Industrial components:** Covers, containers, local reinforcements, sports.



Requirement HL2 | Requirement HL3 | LEOcore 40 mm | LEOcore 2 mm

Tested in a system test with other LEO products.

Properties	Test standard	Unit	Value [1]	LEOcore® 65	LEOcore® 110	LEOcore® 145	LEOcore® 210
Density	ISO 845	kg/m³	Average Type Range	65 60 - 70	110 105 - 115	145 140 - 150	210 200 - 220
Compressive strength perpendicular to the plane	ISO 844	N/mm²	Average Minimum	0.80 0.7	1.4 1.2	2.2 2.0	3.8 3.2
Pressure module perpendicular to the plane	ISO 844	N/mm²	Average Minimum	50 35	80 70	105 95	170 145
Tensile strength perpendicular to the plane	ASTM C297	N/mm²	Average Minimum	1.5 1.2	2.2 1.6	2.7 2.2	3.0 2.4
Tensile modulus perpendicular to the plane	ASTM C297	N/mm²	Average Minimum	85 70	120 90	170 140	225 180
Shear strength	ISO 1922	N/mm²	Average Minimum	0.46 0.4	0.8 0.7	1.2 1.1	1.85 1.5
Shear modulus	ISO 1922	N/mm²	Average Minimum	12 10.5	20 18	30 26	50 44
Shear fracture elongation	ISO 1922	%	Average Minimum	25 15	10 5	8 4	5 3
Thermal conductivity at 10°C	EN 12667	W/m.K	Average	0.037	0.035	0.038	0.045
Standard sheet							
Width		mm ± 5		1220	1220	1220	1220
Length		mm ± 5		2440	2440	2440	2440
Thickness		mm ± 0.5		5 to 100	5 to 100	5 to 100	5 to 100

LEOcore® + SAERTEX LEO = Optimal fire protection for **DIN EN 45545***

Discover our range of sustainable core materials

BALTEK® Balsa

Amorim Corecork®

BALTEK® Balsa SB

Structural end-grain balsa

Description

Made from controlled cultivation, balsa wood cut perpendicular to the grain direction. Balsa is extremely strong and has an excellent rigidity to weight ratio. The excellent styrene and chemical resistance as well as the neutral behaviour during temperature fluctuations make balsa a universal core material. Balsa can be processed with all resin systems and processing technologies and has a very good laminate adhesion. It is a growing core material with a very wide spectrum of applications.

Applications

Marine: Hulls, decks, bulkheads, superstructures, interiors. **Road and rail:** Floor, side and roof panels, front and side covers, interiors. **Wind energy:** Rotor blades, covers for rotor hubs, housings and generators. **Aircraft and aerospace:** Floor panels, parts of the galley, interiors, transport pallets, containers and structural parts for sports aircraft. **Military applications:** Transport pallets, containers, shelters, marine boats. **Industrial components** Covers, tanks, containers, sports equipment (skis, snowboard, kayaks).

Characteristics

Extremely high specific rigidity and strength, good fire behaviour, ecological product, operating temperature of -212 °C to +163 °C (-414 °F to 325 °F, excellent fatigue resistance, good sound and thermal insulation, high impact strength, good resistance to moisture.

Processing

Manual lamination/fibre spraying, resin injection (RTM), gluing, prepreg processing (up to 180 °C, 355 °F), vacuum infusion.

Properties	Test standard	Unit	SB.50	SB.80	SB.100	SB.150
Nominal density	ASTM C-271	kg/m³	109	132	148	285
Minimum sheet thickness	ASTM C-271	kg/m³	84	113	136	248
Compressive strength perpendicular to the plane	ISO 844	N/mm²	5.5	7.7	9.2	22
Pressure module perpendicular to the plane	ISO 844	N/mm²	1616	2187	2526	4428
Tensile strength perpendicular to the plane polyester	ASTM C-297	N/mm²	3.9	5.0	5.7	12.2
Tensile strength perpendicular to the plane epoxy	ASTM C-297	N/mm²	9	10.9	12	18.3
Tensile modulus perpendicular to the plane	ASTM C-297	N/mm²	1682	2337	2791	6604
Shear strength	ASTM C-273	N/mm²	1.8	2.3	2.6	5.2
Shear modulus	ASTM C-273	N/mm²	136	166	187	362
Thermal conductivity at room temperature	ASTM C-177	W/m*K	0.048	0.059	0.066	0.084
Standard sheet						
Width		mm ± 5	610	610	610	610
Length		mm ± 10	1220	1220	1220	1220
Thickness*		mm +0.25 -0.75	4.7 to 76	4.7 to 76	4.7 to 76	6 to 76
Contour core (CK)						
Thickness		mm +0.25 -0.75	4.7 to 50	4.7 to 50	4.7 to 50	6 to 50

**other thicknesses on request.*

Finishing Options, other dimensions and closer tolerances upon request When ordering please specify either LamPrep (fine finish) or AL600/10 coating (reduces resin absorption)
The data provided gives approximate values for the nominal density The information contained herein is believed to be correct and to correspond to the latest state of scientific and technical knowledge. However, no warranty is made, either expressed or implied, regarding its accuracy or the results to be obtained from the use of such information. No statement is intended or should be construed as a recommendation to infringe any existing patent.

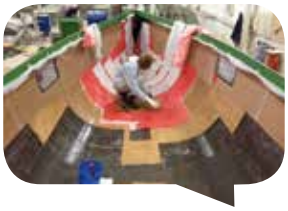
Amorim Corecork®

Corecork® is an ecological core material that is 100% natural, reusable and recyclable. From both the social and ecological viewpoint it is one of the most versatile materials in the world.

Once the bark of the cork oak has reached usable age at around 25 years, the tree is peeled every nine years.

The properties of cork are absolutely unique - the combination of natural and enhanced tightness against liquids and gasses, compressibility, high resilience, lightness, buoyancy, thermal and sound insulation as well as resistance to ignition makes cork an excellent raw material of first choice.

Project Grüne Bente
We supplied the natural material Corecork® for use in the prototype Grüne Bente where if found applications as a core material in the hull and the deck.



Amorim Corecork®

Structural, sustainable bio core material
vibration suppressing I natural I sound insulating

Applications:
Marine, road and rail, wind energy, industrial components, road transport, military applications.

Characteristics
Excellent FST properties, high temperature resistance, impact absorbing, sound insulating, thermally insulating, vibration suppressing, resistant to decomposition, can be freely formed, simple handling, easy to process, low water absorption, can be processed with all common resins and methods, up to 85% return to shape after impact and shock effects.

Properties	Test standard	Unit	NL 10	NL 11 FR	NL 20	NL 25
Weight	ASTM C271	Kg/m³ lb/ft³	120 7.5	160 10.0	200 12.5	250 15.6
Compressive strength	ASTM C365	MPa psi	0.3 29	0.3 29	0.5 72	0.6 87
Pressure module	ASTM C365	MPa psi	5.1 740	5.1 740	6.0 870	6.9 1000
Tensile strength	ASTM C297	MPa psi	0.6 87	0.6 87	0.7 101	0.7 101
Shear strength	ASTM C273	MPa psi	0.9 130	0.9 130	0.9 130	1.0 145
Shear modulus	ASTM C273	MPa psi	5.9 856	5.9 856	5.9 856	6.0 870
Thermal conductivity	ASTM C377	W/mK	0.032	0.042	0.034	0.036
Loss factor (on 1KHz)	ASTM E756	-	0.022	0.022	0.043	0.062
Block						
Thickness			200	10	200	200
Standard sheet						
Width			500	500	500	500
Length			1000	1000	1000	1000
Thickness			2 - 200	2 - 10	2 - 200	1 - 200

Tolerances: NL 25: *> 1 mm ≤ 6 mm ± 0.2 mm,* ***NL 10, NL 11 FR, NL 20*** *: > 2 mm ≤ 6 mm ± 0.2 mm / > 6 mm ≤ 10 mm ± 0.3 mm / > 10 mm ≤ 20 mm ± 0.5 mm / > 20 mm ± 1.0 mm*

Amorim Corecork® NL MAT

Structural bio core material for micro sandwich structures
cost efficient I simple I versatile

Applications:
Marine, road and rail, wind energy, industrial components, road transport, military applications.

Characteristics
High thermal resistance, shock absorbing, thermally and acoustically insulating, low resin absorption compared to polyester nonwovens, vibration suppressing, can be freely formed, simple handling, easy to process, low water absorption, can be processed with all common resins and methods, wide range.

Properties	Test standard	Unit	Corecork NL 10 MAT		Corecork NL 20 MAT		
Thickness		mm	3.0	5.0	1.0	3.0	5.0
Reduction of thickness at 0.8 bar		%	-	-	< 3	< 3	< 3
Maximum processing temperature		°C	150	150	150	150	150
Resin absorption		g/m²	675	1100	170	459	750
Dry weight		g/m²	405	675	200	600	1000
Impregnated density		kg/m³	360	355	370	353	350
Mechanical properties in 3mm impregnated with polyester resin			**NL 10 MAT 3 mm (1)**		**NL 20 MAT 3 mm (2)**		
Flexural strength	ISO 1209-1	MPa	66		57		
Flexural modulus	ISO 1209-1	MPa	5250		4650		
Compressive strength (10% strain)	ISO 844	MPa	3.1		2.0		
Pressure module	ISO 844	MPa	37		25		
Shear strength	ASTM C273-1	MPa	3.6		3.3		
Shear modulus	ASTM C273-1	MPa	36		33		
Water absorption	ASTM C272	%	< 2.5		< 2.5		
Dimensions x			Roll thickness (mm)				
Width: 1000 mm	1.0	2.0	2.5	3.0	3.5	4.0	4.5
Roll length (mm)	40 (a)	40	32	26	23	20	17

(1) 2+2 (600 g/mm.) Glass fibre, polyester resin, manual lamination, (2) 2+2 (600 g/m.) Glass fibre, epoxy resin, infusion (a) excluding NL 10 MAT. Minimum thickness 2.0 mm

Lantor Soric®

Pressure stable polyester nonwoven

Description

Lantor Soric® was developed as core material for thin-walled sandwich parts known as microsandwiches as well as an inter-laminate nonwoven aid in composite parts. Its excellent technical properties enables features such as massive laminate to be replaced by the clean and efficient Soric® microsandwich construction method, which can mean a weight saving of up to 50%. Soric® is pressure stable and therefore guarantees the uniform material thickness of the part. Lantor Soric® also guarantees the flow of resin even to difficult locations within the part. The material is flexible and can be processed manually or by machine without problem.

Applications

Marine, wind energy, rail, automotive, aircraft/aerospace, industry, architecture/construction.

Characteristics

Processing in closed moulds, can be processed with all common resins, resin flow optimisation, simple handling, can be preformed in three dimensions (preforming), up to 50% weight saving (LCR) compared with massive laminate, reduced material use for fibre reinforcement and resin, excellent mechanical properties, flexibility in design and construction, pressure stable.

Processing

Vacuum infusion, resin injection, (RTM, VARTM), RTML, RTMH, pre-preg processing, manual laminating.

Properties	Unit	Soric® SF		Soric® XF					Soric® LRC			Soric® TF		
		SF 2	SF 3	XF 2	XF 3	XF 4	XF 5	XF 6	LRC 1.5	LRC 2	LRC 3	TF 1.5	TF 2	TF 3
Nominal thickness	mm	2.0	3.0	2.0	3.0	4.0	5.0	6.0	1.5	2.0	3.0	1.5	2.0	3.0
Roll length	m	80	50	80	50	40	30	25	70	60	40	120	80	50
Roll width	m	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27
Resin absorption	kg/m^2	1.0	1.3	1.0	1.4	1.9	2.4	2.8	0.6	0.8	1.0	0.8	1.0	1.4
Dry weight	g/m^2	130	170	130	190	260	320	375	140	197	262	90	115	170
Weight (impregnated)	kg/m^3	700	600	600	600	600	600	600	470	470	450	700	700	700
Reduction of thickness at 0.8 bar	%	<15	<15	<10	<10	<10	<10	<10	<15	<15	<15	<25	<25	<25
Maximum processing temperature	°C	170	170	170	170	170	170	170	170	170	170	170	170	170
Flexural strength	MPa	16	-	-	-	8	-	-	-	-	-	-	19	-
Flexural modulus	MPa	1000	-	-	-	800	-	-	-	-	-	-	1500	-
Compressive strength 10 % strain	MPa	6	-	-	-	8	-	-	-	-	-	-	4	-
Tear strength across the layer	MPa	4	-	-	-	4	-	-	-	-	-	-	7	-
Shear strength	MPa	6	-	-	-	3.5	-	-	-	-	-	-	7	-
Shear modulus	MPa	40	-	-	-	35	-	-	-	-	-	-	34	-
Relative resin flow		42 cm	45 cm	46 cm	60 cm	64 cm	65 cm	68 cm	-	-	-	-	36 cm	-

Relative resin flow (flow-front measurement under identical conditions)

Lantor Finishmat®

Surface finishing material

Description

Lantor Finishmat® is a synthetic surface nonwoven that is easy to process. It is highly resistant to chemicals and is weatherproof. Lantor Finishmat® can be worked using open and closed processing techniques.

Applications

Rail vehicles, vehicle construction, industrial components, marine.

Characteristics

Simple processing, becomes translucent with resin, high tensile strength, high wear resistance, high surface quality.

Processing

Manual laminating, spray technology, pultrusion, vacuum infusion, RTM.

Finishmat® D77

Properties	Unit	D7760
Weight	g/m²	60
Thickness	mm	0.30*
Resin absorption	g/m²	400*
Edging		None
Fibres		Polyacrylic
Shear elongation - longitudinal and transverse	%	100
Roll length	m	100
Roll width	m	1.10

**depends on the pressure process*

AIREX S32.50

Flexible foam

Applications

Soft buoyancy material for life jackets, sailing jackets, rescue suits, life jackets with tear-proof PVC coating, produced in a dry process, thermal insulating and buoyancy material for sports clothing, impact protection material.

Characteristics

Closed structure, low raw density, extraordinarily dimensional and volume stability, very soft material that can be easily draped, good thermal insulation, self-extinguishing, impact absorbing, resistant to moisture and decomposition, meets international regulations for buoyancy material: (incl. DIN EN ISO 12402-7: 03/2007 and SOLAS Lifejacket MSC Resolution 200(80)).

Processing

AIREX S32.50 can be processed in a multitude of ways with typical machines and equipment: Cutting, stamping/punching, water jet cutting (up to 15 mm), adhesive bonding, HF welding (up to 6 mm), sewing, quilting, covering using immersion method.

Properties	Test standard	Unit	S32.50
Nominal density	ISO 845	kg/m³	50
Spec. buoyancy (20 mm, fresh water, 20°C)	UL 1191	N/m³	8.80
Compression hardness **25 % compression** **50 % compression**	DIN 53 577	kPa kPa	18 70
Compression set **20 mm 25 %, 22h/23 °C/24h**	ASTM D 1667	%	30
Tensile strength	ISO 1798	kPa	220
Elongation at break	ISO 1798	%	150
Tear resistance	ISO 8067	N/mm	0.36
Volume stability 7 days / 60°C	AIREX 003	%	max. 5
Water absorption in 1 day	DIN 53 428	kg/m²	0.11
The values given are typical for materials of average density.			
Block (with manufacturing skin)			
Length		mm, ± 40	1720
Width		mm, ± 30	1040
Thickness		mm, ± 3	62
Non-trimmed sheets			
Length		mm, ± 40	1720
Width		mm, ± 30	1040
Thickness		mm, ± 1	3 to 20
		mm, ± 1.5	25 to 50
Color			yellowish

Standard packing / blocks: 5 each box / sheets: 60 x 5, 30 x 10, 15 x 20, 12 x 25 mm etc., each box / blanks of all kinds (on request)

AIREX S56.100

Flexible foam

Applications

Insulation and sealing material in the building industry, impact absorbing material, cladding for cabs, cladding for cabs in heavy construction machinery for anti-drumming and thermal insulation.

Characteristics

Closed structure, dimensional and volume stability, resistant against moisture and decomposition, good sealing effect, no water absorption, good thermal insulation, good mechanical properties, impact absorbing.

Processing

AIREX S56 can be processed in a multitude of ways with typical machines and equipment: Cutting, stamping/punching, adhesive bonding, welding.

Properties	Test standard	Unit	S56.100
Nominal density	ISO 845	kg/m³	120
Compression hardness **25 % compression** **50 % compression**	DIN 53 577	kPa kPa	29 91
Compression set **25 %, 72 h, 23 °C** **50 %, 72 h, 23 °C**	ISO 1856	% %	11 31
Tensile strength	ISO 1798	kPa	380
Elongation at break	ISO 1798	%	145
Tear strength	ISO 8067	N/mm	0.61
Thermal conductivity 23 °C	ISO 8301	W/m K	0.042
Water absorption in 7 days	DIN 53 428	kg/m²	0.11
The values given are typical for materials of average density.			
Block (with manufacturing skin)			
Length		mm, ± 40	1320
Width		mm, ± 50	2050
Thickness		mm, ± 4	44
Non-trimmed sheets			
Length		mm, ± 30	1260
Width		mm, ± 50	2050
Thickness		mm, ± 1	3 up to 19
		mm, ± 1.5	20 up to 40
Color			black

Blanks of all kinds (on request)

Upholstery foam H62.90

Polyester upholstery foam (CFC and solvent free)

Applications

Parts of sports equipment and occupational therapy equipment, backing of assemblies, anti-drumming, special packaging, special areas of mattresses.

Characteristics

Open cell polyether foam with high strength. Impact absorbing, very good ability to return to shape.

Properties	Test standard	Unit	H 62.90
Nominal density	DIN EN ISO 845 ASTM D-3574	kg/m³	59 ±3.0
Compression hardness	DIN EN ISO 3386 ASTM D-3574C	kPa	9 ±1.5
Tensile strength	DIN EN ISO 1798 ASTM D-3574E	kPa	min. 140
Shear elongation	DIN EN ISO 1798 ASTM D-3574E	%	min. 70
Compression set (22 h, 50%, 70°C)	DIN EN ISO 1856 ASTM D-3574D	%	max. 6
Fire behaviour	DIN EN 75 200 FMVSS 302		fulfilled
Standard sheet			
Width		mm	1000
Length		mm	2000
Thickness		mm	10-100

This product meets the requirements according to the Ökotex Standard 100, Product Class 1

Upholstery foam T28.40/T40.55

Polyurethane upholstery foam (CFC and solvent free)

Applications

Upholstery for living areas, seat cushions, mattresses.

Characteristics

PU flexible foam, open cell.

Properties	Test standard	Unit	T 28.40	T 40.55
Nominal density	DIN EN ISO 845	kg/m³	26 ± 1,5	38 ±2.0
Compression hardness	DIN EN ISO 3386	kPa	4.0 ± 0.6	5.5 +1.0/-0.7
Tensile strength	DIN EN ISO 1798	kPa	min. 100	min. 120
Shear elongation	DIN EN ISO 1798	%	min. 100	min. 110
Compression set	DIN EN ISO 1856	%	max. 4	max. 4
Loss of hardness	DIN EN ISO 3385	%	max. 40	max. 25
Standard sheet				
Width		mm	1000	1000
Length		mm	2000	2000
Thickness		mm	10-100	10-1000
Color			white	white

This product meets the requirements according to the Ökotex Standard 100, Product Class 1

PE-Trobloc

Polyethylene flexible foam

Description

PE-Trobloc is a cross-linked polyethylene rigid foam It is large-celled and can be mechanically processed very well. The foam is offered in blocks and sheets The foam contains no CFC and HCFC (chlorofluoromethane).

Applications

Industrial components: Sealing material, expanding joints, packaging, case inserts, padding. **Road and rail:** Thermal insulation. **Marine:** Impact absorption, such as boat fenders, buoyancy aids, flotation panels. **Recreation:** Shaped parts for the field of recreation.

Characteristics

Very good mechanical behaviour, good thermal insulation, standard colors black and white. Other colors on request.

Processing

Adhesive bonding, welding, cutting, stamping/punching

Properties	Test standard	Unit	30 N	45 N	60 N	120 N
Nominal density	ISO 845	kg/m³	30 +7/-2	45 +6/-8	60 +10/-8	120 +20/-15
Tensile strength	ISO 1926 ISO 1923	kPa	> 174	> 240	> 350	> 990
Shear elongation	ISO 1926	%	> 84	> 110	> 141	> 110
Compression hardness						
10 %	ISO 844	kPa	> 32	> 60	> 110	> 200
25 %	ISO 844	kPa	> 48	> 76	> 120	> 230
50 %	ISO 844	kPa	> 98	> 142	> 190	> 320
DVR after 22h, 25% Relief 0.5h, 23°	ISO 1856-B	%	≤ 15	≤ 12	≤ 12	≤ 8
DVR after 22h, 25% Relief 24h, 23°	ISO 1856-B	%	≤ 7	≤ 5	≤ 5	≤ 4
Fire behaviour	ISO 3795	mm/ min.	≤ 100	≤ 100	≤ 100	≤ 100
Shore hardness 00	internal		> 38	> 46	> 58	-
Shore hardness A Thermal conductivity			-	-	-	> 33
at 10 °C	ISO 2581	W/mK	0.036	0.037	0.041	0.055
at 40 °C	ISO 2581	W/mK	0.040	0.040	0.043	0.056
Water absorption 28 days	DIN 53428	Vol.%	≤ 1	≤ 1	≤ 1	≤ 1
Max. operating temperature	internal	°C	100	100	100	100
Width		mm	1000	1000	1000	1000
Length		mm	2000	2000	2000	2000
Thickness		mm	5 to 105	5 to 90	5 to 90	5 to 32

Blanks and other thicknesses on request

PE-Trobloc 30 FR

Closed-cell fire retardant foam

Description

Very fine cell, fire retardant polyethylene foam with uniform cell structure, highly elastic despite being used for fire fighting protection.

Applications

Transport, (insulation, filling blocks), impact protection, exhibition stands, construction in buildings, sealing material, profile fillers.

Properties	Test standard	Unit	30 FR
Density	ISO 845	kg/m³	33 ± 4
Shear elongation	ISO 1926	%	72
Tensile strength	ISO 1926	KPa	160
Compressive strength 10% compression 25% compression 50% compression	ISO 844	KPa	36 51 106
Compression set 25%, 22 hrs. ½ hour recovery 24 hour recovery	ISO 1856-B	%	12 5
Max water absorption after 8 days	DIN 53428	Vol.%	1
Max. operating temperature	internal	°C	100
Flammability thickness 10 mm	ISO 3795	mm/min	0
Fire behaviour (depending on application and colour)	UNE 23 727 NF P 92 507		M1
Fire behaviour (depending on application and colour)	DIN 4102-B1		B1
Color			grey
Standard sheet			
Thickness		mm	≥ 85
Length x Width		mm	≥ 2000 x 1000

PE-Trorol

Cross-linked polyethylene foam (rolled goods)

Description

Cross-linked PE flexible foam

Applications

- Thermal insulation of steel yachts, motor homes
- Transport packaging

Characteristics

- Rolled goods

Properties	Test standard	Unit	30 N	130 N
Nominal density	DIN 53420	kg/m³	30	130
Tensile strength longitudinal	ISO 1798	N/cm²	31	123
Tensile strength transverse	ISO 1798	N/cm²	26	126
Shear elongation longitudinal	ISO 1798	%	114	121
Shear elongation transverse	ISO 1798	%	110	123
Compressive stress at 25% deformation 50% deformation	ISO 3386	kPa	53 118	364 572
Water absorption after 24h	DIN EN 12087	Vol. %	< 1.0	< 1.0
Recommended working temperature		°C	-50 - +95	-50 - +95
Thermal conductivity	ISO 8301	W/mK (at 10°C)	0.040	0.060
Fire behaviour	FMVSS302	mm/min at thicknesses >9 mm	< 100	< 100

PE-Trobond

Composite made from polyethylene foam

Core 15 mm PE-Trorol 30 N, cover layers both sides 3 mm PE-Trorol 130 N

Description

Compound sheet material made from cross-linked flexible foam in the designs:

- Core 15 mm PE-Trorol 30 N
- Cover layers both sides 3 mm PE-Trorol 130 N

Applications

- Expansion joints in the field of construction
- Thermal insulation
- Transport protection
- Special packaging

Characteristics

- Closed cell
- No moisture absorption
- Soft, flexible core with a hard-wearing, stable cover layer
- Good good ability to return to shape
- Weathering resistant
- Thermally insulating

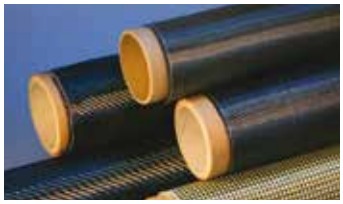
Properties	Test standard	Unit	30 N	130 N	
Nominal density	DIN 53420	kg/m³	30	130	
Tensile strength longitudinal	ISO 1798	N/cm²	23	129	
Tensile strength transverse	ISO 1798	N/cm²	28	133	
Shear elongation longitudinal	ISO 1798	%	103	118	
Shear elongation transverse	ISO 1798	%	101	116	
Compressive strength at 25 % deformation 50% deformation	ISO 3386	kPa	45 105	343 527	
Water absorption 24 D	DIN 53428	vol.-%	<1.0	<1.0	
Rec. working temperature		°C	-50 to +95	-50 to +95	
Thermal conductivity at 10°C	ISO 8301	W/mK	0.041	on request	
Fire behaviour	FMVSS 302	<100 mm/min	at thicknesses > 8 mm	on request	
PE-TROBOND Sheet-format					
Length		mm	1000	1000	1000
Width		mm	400	300	250
Material thickness		mm	21	21	21

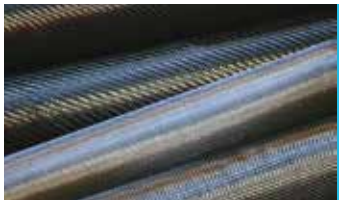
SIGRATEX® woven fabric

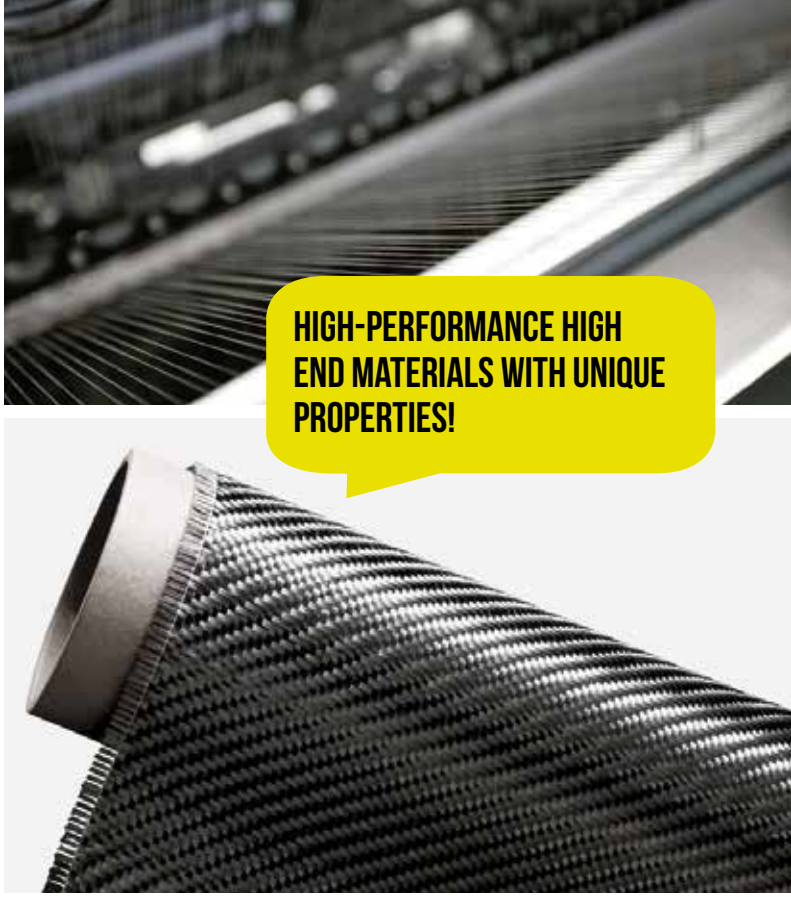
Carbon fibre reinforced plastic materials are high performance materials with unique properties. They are used where other materials are at their limits and are indispensable in many industries today. For example for parts with the highest of strength and rigidity. They are also compatible with various different resin systems and have very good thermal and electrical conductivity.

Gaugler & Lutz offers a large range of SIGRATEX® woven fabric and woven fabric bands. The base of the material is carbon fibre with 1k, 3k, 6k, 12k or 24k. Woven hybrid materials are also available with glass and aramid fibres.

SIGRATEX® woven fabric, woven fabric bands and non-woven fabrics are the most modern reinforcement products. As high-performance, efficient materials they offer a multitude of possibilities across many industries; from automotive and aerospace through wind energy, mechanical engineering, sport, marine and medicine up to the construction industry and anti-ballistics.







SIGRATEX® Woven fabric type	Binding	Basis weight (g/m²)	Width (cm)	Number of fibres Chain (per cm)	Number of fibres Weft (per cm)	Fibre type chain	Fibre type weft	Roll length (running metre)
C W95-PL1/1	Canvas	95 ± 5%	120 +2/-0	7 ± 0.2	7 ± 0.2	Carbon-HT - 1k -67 tex	Carbon-HT - 1k -67 tex	100
C W160-PL1/1	Canvas	160 ± 5%	100 +2/-0	4 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W160-PL1/1	Canvas	160 ± 5%	120 +2/-0	4 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W160-TW2/2	Twill 2/2	160 ± 5%	100 +2/-0	4 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W160-TW2/2	Twill 2/2	160 ± 5%	120 +2/-0	4 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W200-PL1/1	Canvas	200 ± 5%	100 +2/-0	5 ± 0.2	5 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W200-PL1/1	Canvas	200 ± 5%	120 +2/-0	5 ± 0.2	5 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W200-TW2/2	Twill 2/2	200 ± 5%	100 +2/-0	5 ± 0.2	5 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W200-TW2/2	Twill 2/2	200 ± 5%	120 +2/-0	5 ± 0.2	5 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W205-TW2/2	Twill 2/2	205 ± 5%	100 +2/-0	4.4 ± 0.2	4.4 ± 0.2	Carbon-HM - 6k - 225 tex	Carbon-HM - 6k - 225 tex	100
C W220-PL1/1	Canvas	220 ± 5%	5 +15/-0	25	-	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	250
C W220-PL1/1	Canvas	220 ± 5%	7 +15/-0	35	-	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	250
C W220-PL1/1	Canvas	220 ± 5%	10 +15/-0	50	-	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	250
C W220-PL1/1	Canvas	220 ± 5%	12 +15/-0	60	-	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	250
C W220-PL1/1	Canvas	220 ± 5%	110 +2/-0	5 ± 0.2	6 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	214
C W245-PL1/1	Canvas	245 ± 5%	120 +2/-0	6 ± 0.2	6 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W245-TW2/2	Twill 2/2	245 ± 5%	100 +2/-0	6 ± 0.2	6 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W245-TW2/2	Twill 2/2	245 ± 5%	120 +2/-0	6 ± 0.2	6 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W285-TW4/4	Twill 4/4	285 ± 5%	120 +2/-0	7 ± 0.2	7 ± 0.2	Carbon-HT - 3k - 200 tex	Carbon-HT - 3k - 200 tex	100
C W300-PL1/1	Canvas	300 ± 5%	120 +2/-0	3 ± 0.2	3 ± 0.2	Carbon-HT - 12k - 800 tex	Carbon-HT - 3k - 200 tex	100
C W305-PL1/1	Canvas	305 ± 5%	100 +2/-0	3.7 ± 0.2	3.7 ± 0.2	Carbon-HT - 6k - 400 tex	Carbon-HT - 6k - 400 tex	100
C W305-PL1/1	Canvas	305 ± 5%	120 +2/-0	3.7 ± 0.2	3.7 ± 0.2	Carbon-HT - 6k - 400 tex	Carbon-HT - 6k - 400 tex	100
C W305-TW2/2	Twill 2/2	305 ± 5%	120 +2/-0	3.7 ± 0.2	3.7 ± 0.2	Carbon-HT - 6k - 400 tex	Carbon-HT - 6k - 400 tex	100
C W400-PL1/1	Canvas	400 ± 5%	120 +2/-0	4 ± 0.2	4 ± 0.2	Carbon-HT - 12k - 800 tex	Carbon-HT - 3k - 200 tex	100
C W410-TW2/2	Twill 2/2	410 ± 5%	120 +2/-0	5 ± 0.2	5 ± 0.2	Carbon-HT - 6k - 400 tex	Carbon-HT - 6k - 400 tex	100
C W425-TW2/2	Twill 2/2	425 ± 5%	120 +2/-0	2.6 ± 0.2	2.6 ± 0.2	Carbon-HT - 12k - 800 tex	Carbon-HT - 12k - 800 tex	50/100
C W500-PL1/1	Canvas	500 ± 5%	120 +2/-0	3 ± 0.2	3 ± 0.2	Carbon-HT - 12k - 800 tex	Carbon-HT - 12k - 800 tex	50
C W665-TW2/2	Twill 2/2	665 ± 5%	120 +2/-0	4 ± 0.2	4 ± 0.2	Carbon-HT - 12k - 800 tex	Carbon-HT - 12k - 800 tex	50/100
H U140-PL1/1	Canvas	140 ± 5%	6.5 +0.5/-0	24 C / 24A ± 0.2	-	Carbon-HT - 3k - 200 tex / Aramid - 160 tex	Polyester - 76 dtex	250
H W135-PL1/1	Canvas	135 ± 5%	120 +2/-0	6 ± 0.2	5 ± 0.2	Carbon-HT - 3k - 200 tex	E-glass - 34 tex	100
H W170-PL1/1	Canvas	170 ± 5%	24 +2/-0	5 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (2:1)	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (1:2)	100
H W170-PL1/1	Canvas	170 ± 5%	70 +2/-0	5 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (2:1)	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (1:2)	100
H W170-PL1/1	Canvas	170 ± 5%	85 +2/-0	5 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (2:1)	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (1:2)	100
H W170-PL1/1	Canvas	170 ± 5%	100 +2/-0	5 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (2:1)	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (1:2)	100
H W170-PL1/1	Canvas	170 ± 5%	125 +2/-0	5 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (2:1)	Carbon-HT - 3k - 200 tex / Aramid - 160 tex (1:2)	100
H W175-PL1/1	Canvas	175 ± 5%	120 +2/-0	6 ± 0.2	4 ± 0.2	Carbon-HT - 3k - 200 tex	E-glass - 136 tex	100
H W215-TW2/2	Twill 2/2	215 ± 5%	120 +2/-0	5.7 ± 0.2	5.7 ± 0.2	Carbon-HT - 3k - 200 tex / Aramid - 160 tex	Carbon-HT - 3k - 200 tex / Aramid - 160 tex	100

Woven material fixation, facing fabric, special widths and incorporated tracer threads on request

SIGRATEX® bands

Variable fibre directions in carbon with optimum drapability and resin impregnation is possible | high utilization of the mechanical properties | Uni Tape type binding in various different basis weights

SIGRATEX® bands Type	Type of binding	Basis weight (g/m²)	Width (cm)	Number of fibres Chain	Type of fibre Chain	Type of fibre Weft	Roll length (running metre)
C U200-PL1/1	Canvas	200 ± 5%	5 +0.5/-0 cm	100	Carbon-HT - 3k - 200 tex	Polyester - 76 dtex	250
C U200-PL1/1	Canvas	200 ± 5%	10 +1/-0 cm	100	Carbon-HT - 3k - 200 tex	Polyester - 76 dtex	250
C U270-PL1/1	Canvas with glass fibre chain	270 ± 5%	7.5 +0.5/-0 cm	23	Carbon-HT - 12k - 800 tex Glass - EC9 - 136 tex	Polyester - 76 dtex	250
C U280-PL1/1	Canvas with glass fibre chain	280 ± 5%	3.5 +0.5/-0 cm	30	Carbon-HT - 3k - 200 tex Glass - EC9 - 136 tex	Polyester - 76 dtex	250
C U280-PL1/1	Canvas with glass fibre chain	280 ± 5%	7.5 +0.5/-0 cm	39	Carbon-HT - 6k - 400 tex Glass - EC9 - 136 tex	Polyester - 76 dtex	250
C U285-PL1/1	Canvas	285 ± 5%	4.5 +0.5/-0 cm	32	Carbon-HT - 6k - 400 tex	Polyester - 76 dtex	250
C U290-PL1/1	Canvas	290 ± 5%	7.5 +0.5/-0 cm	53	Carbon-HT - 6k - 400 tex	Polyester - 76 dtex	250
C U290-PL1/1	Canvas with glass fibre chain	290 ± 5%	4.5 +0.5/-0 cm	14	Carbon-HT - 12k - 800 tex Glass - EC9 - 136 tex	Polyester - 76 dtex	250
C U330-PL1/1	Canvas	330 ± 5%	16 +1/-0 cm	120	Carbon-HT - 6k - 400 tex	Polyester - 76 dtex	250
C U360-PL1/1	Canvas with glass fibre chain	360 ± 5%	2.5 +0.5/-0 cm	16	Carbon-HT - 6k - 400 tex Glass - EC9 - 136 tex	Polyester - 76 dtex	250
C U365-PL1/1	Canvas	365 ± 5%	5 +0.5/-0 cm	47	Carbon-HT - 12k - 800 tex	Polyester - 76 dtex	250
C U365-PL1/1	Canvas	365 ± 5%	10 +1/-0 cm	47	Carbon-HT - 12k - 800 tex	Polyester - 76 dtex	250
C U370-PL1/1	Canvas	370 ± 5%	16 +1/-0 cm	75	Carbon-HT - 12k - 800 tex	Polyester - 76 dtex	250
H U140-PL1/1	Canvas	140 ± 5%	6.5 +0.5/-0 cm	24 C / 24A ± 0.2 cm	Carbon-HT - 3k - 200 tex Aramid - 160 tex	Polyester - 76 dtex	250

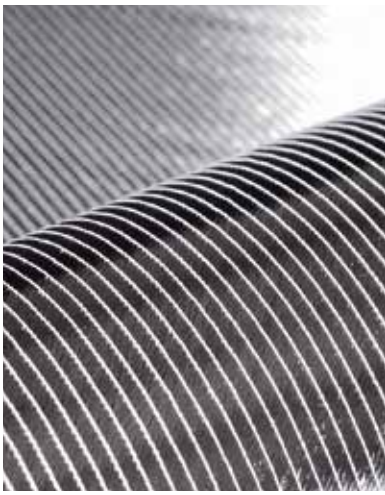
Carbon fibre / aramid fibre content 1:1, C= carbon fibre, A = aramid fibre

SIGRATEX® sewn non-woven material

With non-woven material the fibre strings (rovings) are worked from the bobbins to the flat textiles and are known as multi axial or unidirectional non-woven fabrics. The fibres in a non-woven material always lie in an elongated state, this guarantees the best possible strength.

The non-woven material can be made in various different directions (0°, + or –45° and 90° to the direction of production) and with different grammage. This enables the tailoring of parts with large surface areas with different strengths and wall thicknesses.

SIGRATEX® non-woven type	Fibre orientation	Type of fibre	Weight per sheet (g/m²)	Weight Thread (g/m²)	Total basis weight (g/m²)	Width (cm)	Thread	Roll length (running metre)	Weight of rolls (kg)
HPT®300 C45	±45°	Carbon-HT - 50k 3300 tex	145	6	296 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	24
HPT®300 C090	0°/90°	Carbon-HT - 50k 3300 tex	145	7	297 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	24
HPT®410 C45	±45°	Carbon-HT - 50k 3300 tex	200	6	406 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	31
HPT®410 C090	0°/90°	Carbon-HT - 50k 3300 tex	200	7	407 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	32
HPT®450 C45	±45°	Carbon-HT - 50k 3300 tex	220	6	446 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	34
HPT®450 C090	0°/90°	Carbon-HT - 50k 3300 tex	222	7	451 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	34
HPT®610 C45	±45°	Carbon-HT - 50k 3300 tex	300	6	606 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	32
HPT®610 C090	0°/90°	Carbon-HT - 50k 3300 tex	300	7	607 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	32
HPT®810 C04590	0°/±45°/90°	Carbon-HT - 50k 3300 tex	200	8	808 ± 7 %	126/254 ± 1 cm	Polyester yarn	35	41
HPT®610 C045	0°/±45°	Carbon-HT - 50k 3300 tex	200	8	608 ± 7 %	126/254 ± 1 cm	Polyester yarn	35	32
HPT®320 C0	0°	Carbon-HT - 50k 3300 tex / E-glass - 68 tex	300	6	320 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	26
HPT®440 C0	0°	Carbon-HT - 50k 3300 tex / E-glass - 68 tex	400	6	439 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	32
HPT®520 C0	0°	Carbon-HT - 50k 3300 tex / E-glass - 68 tex	472	7	519 ± 7 %	126/254 ± 1 cm	Polyester yarn	35/50	28/38
HPT®620 C0	0°	Carbon-HT - 50k 3300 tex / E-glass - 68 tex	584	7	621 ± 7 %	126/254 ± 1 cm	Polyester yarn	50	39



(© SGL Group)

SIGRATEX® fixed non-woven material

Ultralight, high-strength carbon with reduced resin use | Class A surface, non-crimp | economic use of resin | highest cost efficiency | various different thread fixation | various different basis weights

Fixed non-woven type	Fibre orientation	Type of fibre	Basis weight (g/m²)	Width (mm)	Fixation	Roll lengths (running metre)
C B160-45/SO	±45°	Carbon-HT	160 ± 5%	520 ± 2 %	Grid on one side	50
C B160-45/SO	±45°	Carbon-HT	160 ± 5%	630 ± 2 %	Grid on one side	50
C B200-45/SO	±45°	Carbon-HT	200 ± 5%	530 ± 2 %	Grid on one side	50
C B200-45/SO	±45°	Carbon-HT	200 ± 5%	630 ± 2 %	Grid on one side	50
C B250-45/SO	±45°	Carbon-HT	250 ± 5%	630 ± 2 %	Grid on one side	50
C B300-45/SO	±45°	Carbon-HT	300 ± 5%	800 ± 2 %	Grid on one side	50
C B300-45/SO	±45°	Carbon-HT	300 ± 5%	1200 ± 2 %	Grid on one side	50
C U80-0/SO	0°	Carbon-HT	80 ± 5%	300 ± 2 %	Grid on one side	250
C U80-0/SO	0°	Carbon-HT	80 ± 5%	600 ± 2 %	Grid on one side	250
C U100-0/SO	0°	Carbon-HT	100 ± 5%	200 ± 2 %	Grid on one side	250
C U100-0/SO	0°	Carbon-HT	100 ± 5%	300 ± 2 %	Grid on one side	250
C U100-0/SO	0°	Carbon-HT	100 ± 5%	600 ± 2 %	Grid on one side	250
C U125-0/SO	0°	Carbon-HT	125 ± 5%	50 ± 2 %	Grid on one side	250
C U125-0/SO	0°	Carbon-HT	125 ± 5%	300 ± 2 %	Grid on one side	250
C U125-0/SO	0°	Carbon-HT	125 ± 5%	600 ± 2 %	Grid on one side	250
C U150-0/SO	0°	Carbon-HT	150 ± 5%	300 ± 2 %	Grid on one side	250
C U150-0/SO	0°	Carbon-HT	150 ± 5%	600 ± 2 %	Grid on one side	250
C U200-0/SD	0°	Carbon-HT	200 ± 5%	300 ± 2 %	Grid on two sides	150
C U200-0/SD	0°	Carbon-HT	200 ± 5%	600 ± 2 %	Grid on two sides	150
C U200-0/SO	0°	Carbon-HT	200 ± 5%	50 ± 2 %	Grid on one side	250
C U200-0/SO	0°	Carbon-HT	200 ± 5%	300 ± 2 %	Grid on one side	250
C U200-0/SO	0°	Carbon-HT	200 ± 5%	600 ± 2 %	Grid on one side	250
C U240-0/SO	0°	Carbon-HT	240 ± 5%	60 ± 2 %	Grid on one side	250
C U250-0/SD	0°	Carbon-UHM	250 ± 5%	244 ± 2 %	Grid on two sides	125
C U250-0/SD	0°	Carbon-UHM	250 ± 5%	600 ± 2 %	Grid on two sides	250
C U250-0/SO	0°	Carbon-HT	250 ± 5%	600 ± 2 %	Grid on one side	625
C U300-0/SD	0°	Carbon-HT	300 ± 5%	300 ± 2 %	Grid on two sides	150
C U300-0/SD	0°	Carbon-HT	300 ± 5%	600 ± 2 %	Grid on two sides	150
C U300-0/SO	0°	Carbon-HT	300 ± 5%	50 ± 2 %	Grid on one side	250
C U300-0/SO	0°	Carbon-HT	300 ± 5%	75 ± 2 %	Grid on one side	250
C U300-0/SO	0°	Carbon-HT	300 ± 5%	100 ± 2 %	Grid on one side	250
C U300-0/SO	0°	Carbon-HT	300 ± 5%	300 ± 2 %	Grid on one side	250
C U300-0/SO	0°	Carbon-HT	300 ± 5%	600 ± 2 %	Grid on one side	625
C U450-0/SD	0°	Carbon-UHM	450 ± 5%	635 ± 2 %	Grid on two sides	100
C U500-0/SD	0°	Carbon-HT	500 ± 5%	300 ± 2 %	Grid on two sides	250
C U500-0/SD	0°	Carbon-HT	500 ± 5%	625 ± 2 %	Grid on two sides	250
C U600-0/SD	0°	Carbon-HT	600 ± 5%	300 ± 2 %	Grid on two sides	150
C U600-0/SD	0°	Carbon-HT	600 ± 5%	1266 ± 2 %	Grid on two sides	415

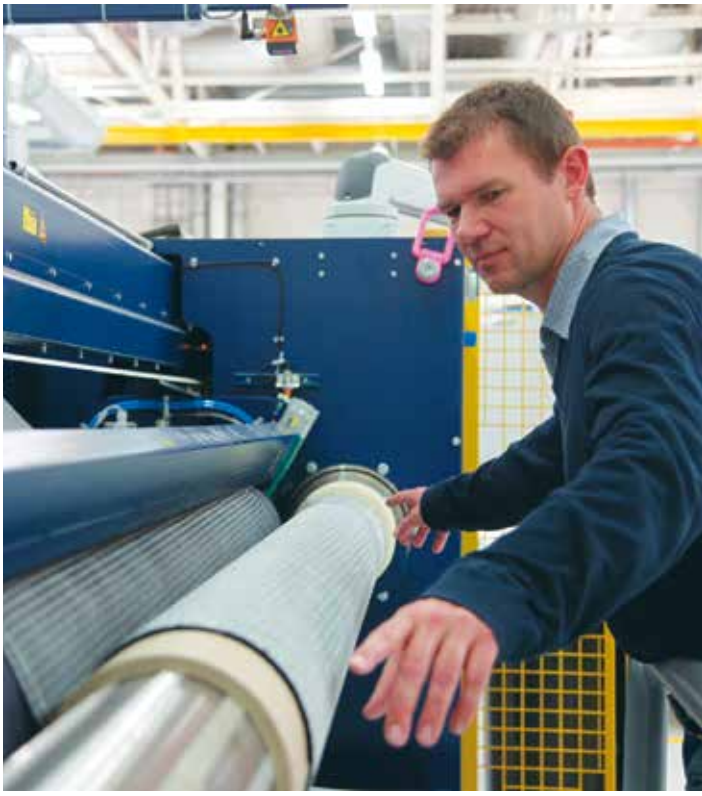
SO = grid fixation on one side, SD = grid fixation on two sides

SIGRATEX® nonwoven

Flexible, easily preassembled and electrically conductive | high resin impregnation | optimum drapability | fibre direction in the part can be varied | high utilisation of mechanical properties | various different binders in different basis weights

SIGRATEX® nonwoven type	Basis weight (g/m²)	Width (cm)	Type of binding	Proportion of binding (weight %)	Fibre length (mm)	Tear strength (N/15 mm)	Surface resistance (Ω)	Roll length (running metre)
C N20-T220/20g	20	100	Styrene soluble Polyester	10	6/12	20	2-10	100
C N30-T210/30g	30	100	Polyvinyl alcohol	10	6/12	30	2-10	100

Roll length 100 m, Roll width 100 cm



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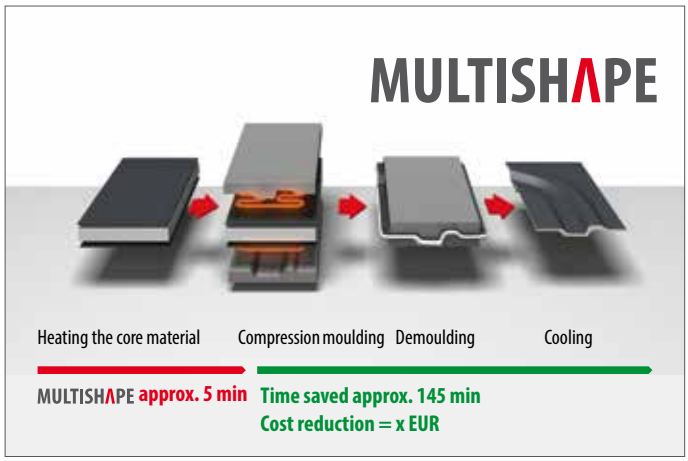
MULTISHAPE®

With MULTISHAPE® we initially focussed our vision on three main processes for producing thermoplastic parts.

What is MULTISHAPE®?
MULTISHAPE® is a Gaugler & Lutz in-house production process that draws its system technology from the deep-draw plastics industry. The name hints at the multitude of possibilities for the production of different geometric parts with very diverse uses. The materials used are mainly from the lightweight construction sector, such as structural foam products or fibre reinforced cover layers.



The properties of the thermoplastic materials are used to form lightweight, rigid three dimensional geometries in a short cycle time. The material is heated to forming temperature with partially adjustable halogen spotlights and pressed to the desired shape in a rapidly-closing press tool unit. After a shortened cooling cycle the part can be removed, sometimes even with a trimmed peripheral zone.

One-Shot Sandwich

By pressing a thermoplastic cover layer onto the core material a sandwich can be produced in one step. The cycle time and the process sequence remain virtually the same; the forming temperature of the cover layer should only need adjusting.

A decorative surface can be applied in the same working cycle.

Twin-Sheet

Point heating of zones being locally welded enables the creation of twin-sheet parts with complex geometries.

Thermopresses

The foam is heated to its forming temperature, partially compressed and at the same time stretched. Foam cells can be deformed in different directions, which enable unprecedented constructive flexibility in these short cycle times.

DECORATIVE SURFACE:
THE MOST DIVERSE SURFACE MATERIALS CAN BE USED TO FINISH OFF THE SANDWICH CONSTRUCTION.

CORE MATERIAL:
THERMOPLASTIC STRUCTURAL RIGID FOAM, SUCH AS THOSE BASED ON PET.

PEELCORE®

Your requirements are our motivation

Individual boards are peeled from blocks of thermoplastic plastics. They can be thinner than a match head, offer innumerable benefits and have a high weight saving potential.

Applications

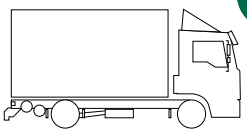
Model building, automotive sector, sports equipment, loudspeakers. Printed circuit boards.

The PEELCORE® process

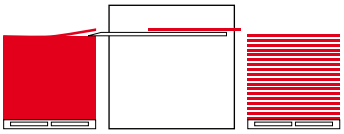
Wafer-thin, nearly transparent sheets are separated from the surface of the blocks. These can be used as the centre layer in lightweight and sandwich constructions.

Peelcore sheets are very precise and free of dust.

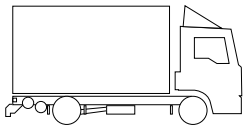
1 TRANSPORT TO GAUGLER & LUTZ IN AALEN/GERMANY



2 CONVERTING/PEELING THE MATERIAL TO THE REQUIRED DIMENSION AT G&L



3 TRANSPORT TO CUSTOMER



KIT preassembly

Material selection, tool configuration, compliance with special customer requirements.

Whether below or above water, in the fields of wind energy, rail, road, medicine, industry or architecture, our specialists meet your specific and special material requirements with precise preassembly and high quality.

- The most modern infrastructure and control technology
- Qualitative, quantitative and temporal process monitoring
- Digital coordination and cooperation between the available resources
- Dealing in high-quality preassembled goods and merchandise

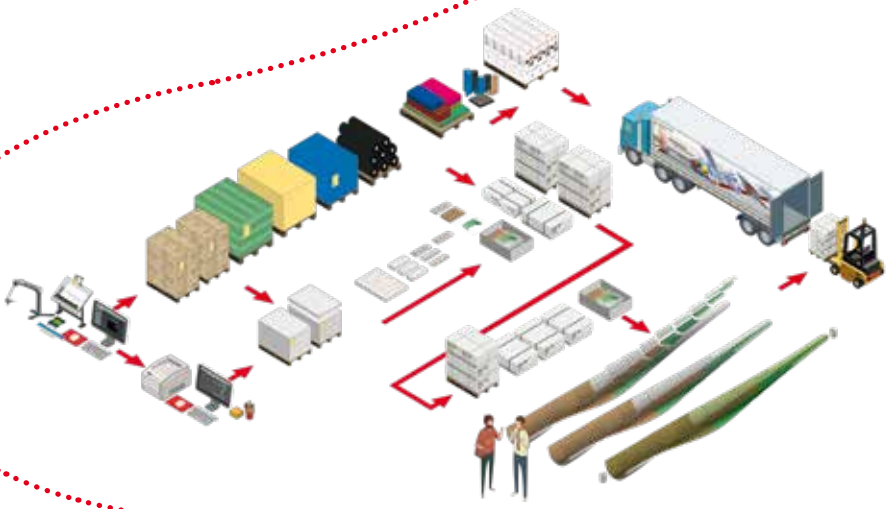
Data from customers
Data gathering/data recording/data generation

CAD/CAM
Data recording and processing/data optimisation/data integration

Enterprise resource planning (ERP)
product management: Purchase/ production/sales/CRM

ERP/PPS production order generation
Manufacturing Execution System (MES)

Production
Block processing/sheet processing/ part processing/part marking



Quality management
Control measurements

Logistics/commissioning/labelling
Commissioning process/packaging process/dispatch

Customer/receiver
Goods receiving/unpacking process

9 **Further processing at the customer**
Laying into the mould

Preassembly

Our competencies

- Technical consultation and on-site advice
- Fast and non-bureaucratic development
- Short delivery times through flexible production and a well organised warehouse
- Wide range of products, such a core materials, reinforcement fibres and accessories
- Renowned material suppliers
- Multiple preassembly opportunities made possible by an extensive range of equipment
- Guaranteed consistent quality

Manual preassembly

- Horizontal saw
- Vertical saw
- Grinding machine
- Stamping/punching machine
- Series hole drilling machine
- Multi-sheet grooving machine
- Milling machine

Measuring technology

- Measuring arm with report capability
- Assurance of the quality standards

Surface treatment

Ask our sales personnel about the ideal surface processing for your project A multitude of surface processing options are available.

Grooving

- Prevents air inclusions by promoting better venting
- Supports the flow of resin, for example when using the RTM process
- Increases flexibility that means improved formability

Variants:

- Cross-grooved both sides, approx. 2 mm deep
- Longitudinal grooved both sides
- Cross-grooved both sides, approx. 2/3 deep
- Diamond grooves



Infusion grooving

- cross- grooved one sided, 20 x 20 cm grid with perforation Ø 2 mm in the cross point of the grooves

Scrim

- Diced rigid foam sheets with a glass grid woven fixing
- Especially developed for processing complex shapes
- Generated simply by laying in rounded moulds without creating stresses in the part
- No expensive and time-consuming preforming of the core material required

Variants:

- Scrim, scored - groove width approx. 0.8 mm
- Scrim, sawn - groove width approx. 1.2 mm
- Scrim, sawn and blade cut
- 30 x 30 mm grid, 15 x 15 mm grid
- Other grids on request



CNC controlled preassembly

- Vertical contour cutter
- Horizontal contour cutter
- 4 axis machining
- 5 axis machining

Perforation

- For venting (vacuum process)
- Ensures complete distribution of the resin over the inner and outer surfaces (vacuum process, RTM process)

Perforate:
Ø 3 mm, Ø 2 mm

Grid:
32 mm, 64 mm, 96 mm

Grinding

- High precision, e.g. for processing in closed moulds
- Smooth surface

Tight thickness tolerance:
± 0.2 mm

3D - forming

Gaugler & Lutz offer the following variants of 3D forming of thermoplastic foams, cover layers and organic sheets (= fibre reinforced thermoplastic semi-finished products):

- Forming of foams
- Forming of foams with simultaneous application of cover layers
- Forming of foams with simultaneous application of cover layers and decorative surfaces, e.g. soft-touch material.

Take advantage of numerous material combinations that can be joined using thermoplastic methods.

softX® MULTISHAPE BOARD AIREX®

Sport/rehabilitation/leisure

The right product for every training goal

Gaugler & Lutz have proven a reliable partner to Airex for more than 30 years, as its general representative in Germany and as the largest importer in the world market. Gaugler & Lutz sell all AIREX products and also its own brands softX® and MULTISHAPE BOARD® through a large dealer network. Gaugler & Lutz is represented at all major trade fairs and is involved in sponsoring at many national sports events.

AIREX® Mats and Balance products
*excluded unembossed Balance-Pads
certified & recommended
AGR Aktion Gesunder Rücken e.V.
Forum Gesunder Rücken
BdR Bundesverband Deutscher Rückenschulen

www.mats-and-more.de

Gaugler & Lutz

Your contact

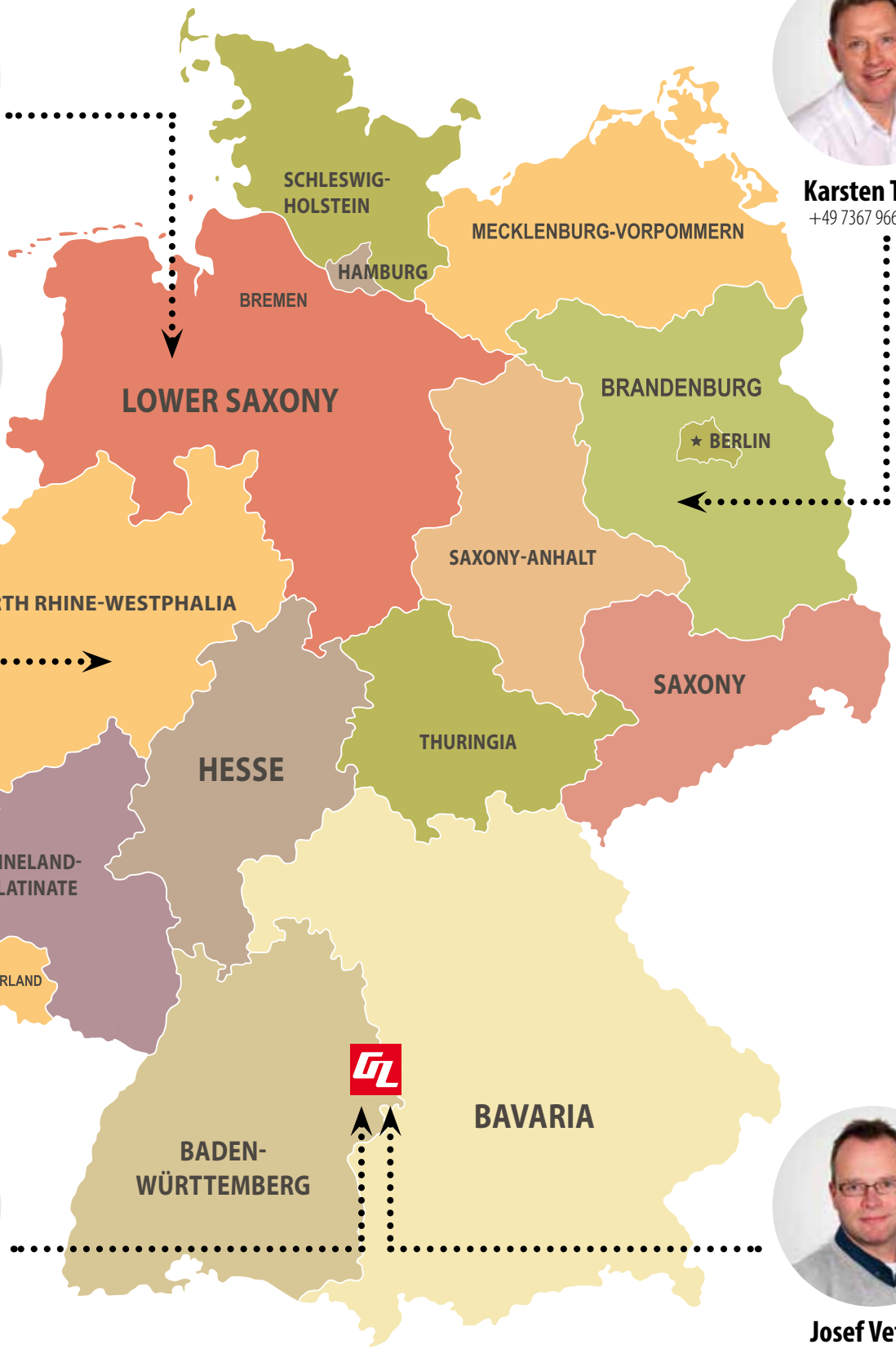
Werner Kurtz
+49 7367 9666-291

Wolfram Sultze
+49 7367 9666-292

Karsten Thiel
+49 7367 9666-290

David Franz
+49 7367 9666-294

Josef Vetter
+49 7367 9666-23



We will meet your special and individual requirements for the road and rail, marine, wind energy, aircraft and aerospace, construction and architecture sectors as well as in the fields of sport, rehabilitation and recreation.

Gaugler & Lutz

Our specialists are always available to help

Please direct your enquiries to:
Telephone: **+49 7367 9666-555**
E-mail: **angebot@gaugler-lutz.de**

For special inquiries regarding lightweight and sandwich construction please call the following: **+49 7367 9666-777**

For special inquiries regarding sport/rehabilitation/leisure please call the following: **+49 7367 9666-888**

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Gaugler & Lutz GmbH & Co. KG | Habsburgerstraße 12 | 73432 Aalen-Ebnat | Telephone +49 7367 9666-0 | info@gaugler-lutz.de | www.gaugler-lutz.de