



Mould Making Materials
Release Agents
Resins
Peroxides
Fiber-Reinforcements
Sustainable Materials
Core Materials
Prepregs
Primer
Film Adhesives
Adhesives
Consumables

# **Performance Products**

Composites and Tooling Product Portfolio Germany

# Our Partners



# Your Global Distribution Partner in Plastics, Rubber, and Specialty Chemicals

Founded in 1906 in Hamburg, Germany, today the fully family-owned company focuses on specialized market know-how and application-based technical advice across numerous industries in the business units Standard Polymers, Engineered Polymers, Performance Polymers, Rubbers, HealthCare, Industrial and Consumer.

## **Expertise In Performance Products**

The Composites & Tooling segment brings together our expertise in composite materials.

Our comprehensive and sustainable portfolio includes products for every stage, from model making and tooling to final composite parts – such as core materials, tooling boards, prepregs and specialty reinforcements – offering tailored solutions that enhance efficiency, reduce waste, and help our customers achieve their performance and sustainability goals.



#### Smart. Sustainable. Solutions.

As an international family-owned company, sustainable actions have always been one of our core values. We are convinced that sustainability can only be achieved through an equal commitment to the three pillars: economic, environmental and social responsibility. Against this backdrop, we pursue a holistic approach to sustainability in our operating business that takes into account the specific requirements of various markets and industries. Day by day, we work closely with our suppliers and customers to continuously make our product portfolio more sustainable.

## **Our Offices and Sales Regions**



## **Global Network, Local Expertise**

With subsidiaries in more than 50 countries, Biesterfeld Group serves over 20,000 customers across 120 countries. Our expansive global network ensures that you receive the highest quality products and services, no matter where you are located. We combine our international reach with a local touch, offering personalized service and support that meet the specific demands of each market.

- Active market development combined with high innovation capacities
- Application-based laboratories
- Customer-specific advice from specialists with solutionoriented technical expertise and extensive market knowhow
- Long-standing cooperations with leading global suppliers mostly on an exclusive basis
- Proximity to customers thanks to branches in Europe, North Africa, Latin America and in the growth region South East Asia



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It all starts with your idea.

With our support it becomes

# Lighter Stronger Greener





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#### Dear Valued Customer,

We are excited to introduce our comprehensive product portfolio for fiber-reinforced composites, model and mold making as well as selected adhesives. Our offerings are continuously expanding. If you are looking for a product that is not listed here, please do not hesitate to contact us. We offer application-based technical advice and focus on supporting our customers in finding the best solution tailored to their individual needs and market challenges. Depending on the application, we advise and guide you right from the first idea through to series production.

#### **Contact information for every country:**

Biesterfeld SE Ferdinandstrasse 41 20095 Hamburg Phone: +49 40 32008-0 Fax: +49 40 32008-696 www.biesterfeld.com



# Lighter Stronger Greener

In a world with increasing climate change, the industry itself must take responsibility, to show the right way forward towards a more sustainable future. Sustainability can mean many things in our industry. The choice of raw materials, the CO<sub>2</sub> footprint, circularity, the quality of the product, availability, support, the lifetime of a component (LCA), local or decentralized production are all important factors that contribute to the level of sustainability.

Biesterfeld is the global industrial partner that shows the way to a more sustainable future. From the early idea to the finished product.

Biesterfeld will have a quality solution for your application and process.



# **Mould Making Materials**



## Resins for tooling skin coats and manufactured parts

High performance materials for moulds in the automotive, aviation, marine, and wind industry.

Product name	Desciption	Variants available	Geltime [min]	Shear rate [s <sup>-1</sup> ]	Viscosity at 25 °C [P]
Crestamould® RTR4010PA	Low shrink rapid tooling resin	-	25-34	37.35	4,5-5,5
Crestamould® VE 690 PA	DCPD/VE skin coat tooling resin	-	15-25	37.35	5
Crestamould® B21	Sealing resin	-	15-20	6	19-24
Mouldguard	Mould protection coating	Brush and spray	12-15	-	Thixotropic
Crestamould® 15PA	High Performance VE tooling gelcoat	Brush and spray	6-40	4500	14
Crestamould® Primecoat	High build, polyester coating	-	30	-	-
Crystic® Glosscoat	High gloss, polyester coating	-	30	-	-

Scott Bader's latest molding technology delivers high moldability, strong chemical resistance, and reliable structural integrity. Our products aim to improve efficiency, reduce costs, and enhance product quality.





The Crestamould System delivers high-performance composite moulds, ensuring unmatched quality in boat manufacturing.



## **High Performance Tooling Prepregs**



Opting for composite tooling offers numerous benefits over other types of tooling. Tooling prepregs are a cost effective way to produce lightweight, accurate tools with matched CTE and reduced cycle times. Additionally, they facilitate the creation of complex designs with a superior surface quality.

Product name	Product form	Out life [days]	Service temp. [°C]	Cure flexibility/recommended cure [°C]	Cure method
LTM <sup>®</sup> 217	Epoxy Prepreg	8	180	20 hours at 55 or 5 hours at 80 Post-cure 15 minutes at 200 plus 8 hours at 190	Autoclave / Vacuum
LTM <sup>®</sup> 350	Epoxy Prepreg	2 to 3	180	3 hours at 60 Post-cure 3 hours at 180	Autoclave / Vacuum
DURATOOL® 450	BMI prepreg	45	190	6 hours at 177 Post-cure 6 hours at 226	Autoclave

#### Syensqo tooling materials are characterised by:

- Low temperature initial cure out-of-autoclave systems
- Possibility to use of low cost/low temperature master models
- Combination of good mechanical performance and toughness, leading to the manufacture of robust tooling
- Bismaleimide prepregs for high temperature capable tooling
- Ease of use with a broad processing window
- Excellent surface finish



# Release agents



# Release agents, cleaning granulates and other process chemicals certified for aerospace applications.

Zyvax is ChemTrend's premium brand offering advanced solutions for the composites, aviation, and high-performance materials industries. Specializing in state-of-the-art mold release agents and surface treatments, Zyvax products ensure exceptional surface quality, increased efficiency, and reduced waste. Designed to meet the exacting standards of the aviation sector and other cutting-edge applications, Zyvax reflects ChemTrend's commitment to innovation, quality, and sustainability in modern manufacturing.

Category	Product name	Description	Benefits
Cleaner	Zyvax WaterClean	water-based mold and finished parts cleaner	solvent-free non-flammable cost effective
	Zyvax Mold Cleaner 10W	water-based mold cleaner for composite materials	solvent-free non-flammable cost effective
	Zyvax FreshStart	solvent-Free Mold and Finished Part Cleaner	Cost effective Easy to apply Non-flammable
Primer	Zyvax MPP 1006W	water-based semi-permanent mold prime	Especially formulated for sealing and priming tooling substrates
Sealant	Zyvax Sealer 1028W EU	water-based mold sealer	Suitable for all manufacturing processes in the composite materials sector High abrasion resistance
	Zyvax Sealer 1050	solvent-based semi-permanent sealer	Easy application (wipe-on, let-dry method) extends the life of the release coating
	Zyvax Sealer GP	solvent-based mold sealer	Thermal stability 480° restores vacuum integrity retains mold detail and finish
Release Agent	Zyvax Departure	water-based semi-permanent release agent	Thermal stability 260° solvent-free easy application by spraying or wiping
	Zyvax 1070W EU	water-based semi-permanent release agent	Recommended for applications that require post-processing eg secondary bonding
	Zyvax TakeOff	water-based semi-permanent release agent	High mechanical and temperature resistance fast drying
	Zyvax WaterShield EU water-based semi-permanen release agent		Thermal stability 260° PFAS Free High gloss
	Zyvax PreFlight	water-based mold surface sealer	Non-flammable Thermal stability 340° Restores vacuum integrity



## Resins



Explore high-performance resins designed for construction, manufacturing, and industrial applications. Engineered for superior adhesion, our resins boast exceptional versatility across a spectrum of uses, from composite fabrication to intricate molding. Their robust resistance to environmental elements ensures durability, making them the go-to choice for demanding projects.

In collaboration with our partner Scott Bader, we offer a comprehensive portfolio of polyester resins, vinylester resins, and urethane acrylate resins. The Crystic® polyester resins are renowned for their mechanical strength and adaptability, making them ideal for marine, automotive, and construction applications. Crestapol® urethane acrylate resins combine exceptional toughness and chemical resistance, perfect for advanced composites in industrial and transportation sectors. With this diverse portfolio, we deliver innovative solutions to meet the needs of industries requiring superior performance and reliability.

Product name	Description	Variants available	Markets	Geltime [min]	HDT [°C]	Shear rate [s <sup>-1</sup> ]	Viscosity at 25 °C [P]
Crystic® 199	Highly crosslinked UL approved Iso resin with high HDT	Geltime, Viscosity	Tanks	20-50	110-130	37.35	6
Crystic® 2-4XX	HLU range of general purpose ortho resins	Geltime, Viscosity	Marine, Industrial, Building	15-70	55-80	37.35	3-4
Crystic® 491	HLU marine grade Iso resin	Geltime, Viscosity	Marine, Industrial, Building	10-50	75-90	37.35	5-6,5
Crystic® 474	Ortho resin with excellent heat resistance properties	Geltime	Industrial, Building, Pipe	10-40	110-115	37.35	5,3
Crystic® LS 451	DCPD based HLU resin for marine applications	-	Marine	20-40	55-60	37.35	4-6
Crystic® 703	DCPD based infusion resin for marine applications	Geltime, Viscosity	Industrial, Building, Pipe	20-300	55-65	-	1,6
Crystic® \$\frac{1}{2}\$	Bio content polyester resin	Geltime, Viscosity	Industrial, Building, Pipe	10-30	70-75	-	-

## **Vinyl Ester**

Product name	Description	Variants available	Markets	Geltime [min]	HDT [°C]	Shear rate [s <sup>-1</sup> ]	Viscosity at 25 °C [P]
VE 679	Vinyl ester DCPD resin with excellent surface finish for marine skin coat and tooling applications	Geltime, Viscosity	Marine, Tooling	10-110	90-100	37.35	3,5
VE 673	Epoxy Novalac Vinyl ester resin with excellent chemical resistance	Geltime, Viscosity	Industrial, Building	10-40	125-135	-	2,5-3

# Low viscosity urethane acrylate-based resins

Product name	Description	Variants available	Markets	Geltime [min]	HDT [°C]	Shear rate [s <sup>-1</sup> ]	Viscosity at 25 °C [P]
Crestapol® 1210	Rapid curing Urethane acrylate based resin for closed mould applications	-	Industrial, Building	10-50	90-95	37.35	1,75
Crestapol® 1211A	Pre-filled Urethane Acrylate resin for closed mould FST applications	-	Building, Transportation	10-90	60-65	4500	5
Crestapol® 1212	Low Viscosity Urethane Acrylate resin designed to be filled with ATH for FST continous process and closed mould applications	-	Building, Transportation	20-70	85-90	4500	0,7
Crestapol® 1216	Rapid curing Urethane acrylate based resin HLUapplication	-	Industrial, Building	5-60	75-80	-	1,75
Crestapol® 1255	Rapid curing Urethane acrylate resin for Pultrusion applications	-	Industrial, Building, Transportation, Wind	8.5	90-100	-	-
Crestapol® 1250	High performance Urethane acrylate for pultruded structural applications	Viscosity	Industrial, Building, Transportation, Wind	10-100	105-110	4500	2,25
Crestapol® 1261	High performance Urethane ac- rylate for closed mould structural applications	Geltime	Industrial, Building, Transportation, Wind	20-50	105-110	4500	2,25
Crestapol® 1256	Rapid curing Urethane acrylate resin for Pultrusion applications	-	Industrial, Building, Transportation, Wind	20-50	75-80	-	-



# Fire Protection System LEO®





The Scott Bader Crestafire® LEO (Low Fire, Smoke, and Toxicity Emissions) System is a cutting-edge solution designed for industries requiring superior fire performance without compromising strength and durability. Engineered to meet stringent global fire safety standards, Crestafire® LEO combines advanced resin and gelcoat technologies to deliver exceptional fire resistance, low smoke production, and minimal toxic emissions.

Ideal for applications in transportation, construction, and marine sectors, the Crestafire® LEO System provides a lightweight, sustainable alternative to traditional materials, ensuring enhanced safety, longevity, and environmental responsibility. Partner with Scott Bader to innovate with confidence, knowing your products meet the highest safety requirements.

Product name	Description / fire standards	Variants available	Markets	Geltime [min]	HDT [°C]	Viscosity at 25 °C - Brookfield RVT, Sp5 / 2.5 rpm [P]
Crestafire® GCS1001	Intumescent gelcoat for EN 45545 HL2 applications	Cure system	Transportation, Wind, Building	5-30	50-60	33-34
Crestafire® GCS1005	Intumescent gelcoat for EN 45545 HL3 applications	Cure system	Transportation, Wind, Building	5-30	55-65	33-34
Crestafire® P1-3001	Filled resin capable of meeting EN 45545 HL2 and HL3 with specific gelcoats	Cure system	Transportation, Wind, Building	10-40	50-60	5
Crestafire® Bio P1-8001	100% Plant-based resin (carbon neutral) capable of meeting EN45545-2 HL3	Cure system	Transportation, Building, Construction	-	-	-
Crystic® 5046	Filled resin capable of meeting NFP 92, NF 16-(M1 F2) with specific gelcoats	Cure system	Industrial, Building Transportation	15-25	85-95	-
GC 70 AG	Anti graffiti, pre-accelerated, low smoke fire retardant gelcoat capable of meeting HL2 rating	Colours, Cure system	Wind, Building	8-65	60-65	-

#### **SAERTEX LEO®** System

The SAERTEX LEO® SYSTEM delivers customized, high-performance solutions with advanced fire protection, integrating fabric, resin, gelcoat, and optional core material. Ideal for structural components in rail, marine, and construction, it supports vacuum infusion and RTM processes for complex shapes. Meeting strict fire safety standards like EN 45545-2 and DIN SPEC 91326, the system ensures consistent, reproducible fire protection throughout each part.

This lightweight system provides exceptional mechanical strength, rigidity, and weather resistance (NF EN 13523-27 Kesternich test), resulting in durable, low-maintenance finishes. Its efficient design minimizes material use and reduces production costs, with standardized infusion technology eliminating lengthy curing steps.

SAERTEX, in partnership with SCOTT BADER, offers global availability and support for LEO SYSTEM materials, which are halogen-free, non-toxic, and optimized for high fire safety requirements. Versatile and adaptable, the system is available in configurations for HL2 (R1, R7, R10, R17) and HL3 (R10) applications, including glass and carbon options and a range of finishes for specialized industry needs.

## **Crestafire LEO systems from Scott Bader and SAERTEX**

# Scott Bader SAERTEX LEO System HL2 R17

Optimised solution for infusion of structural composites with FST properties

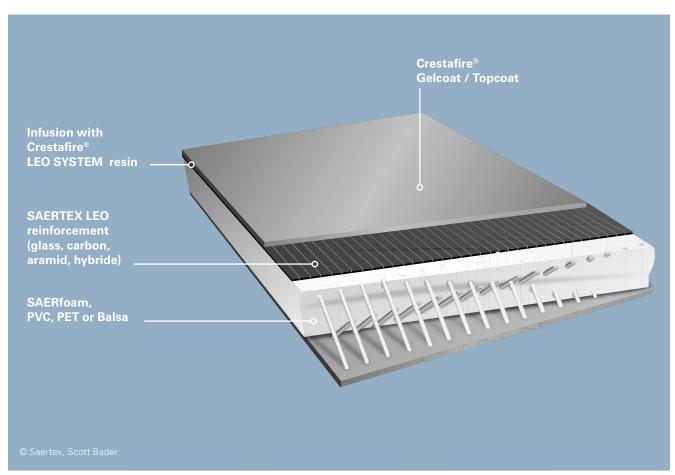
# Scott Bader SAERTEX LEO System HL2 R1, R7, R17

Designed for EN45545-2 HL2 interior, exterior rail parts and front ends

### New Scott Bader SAERTEX LEO System HL3 R1, R7, R17

Designed for EN45545-2 HL3 interior, exterior rail parts and front ends







## **Gelcoats**



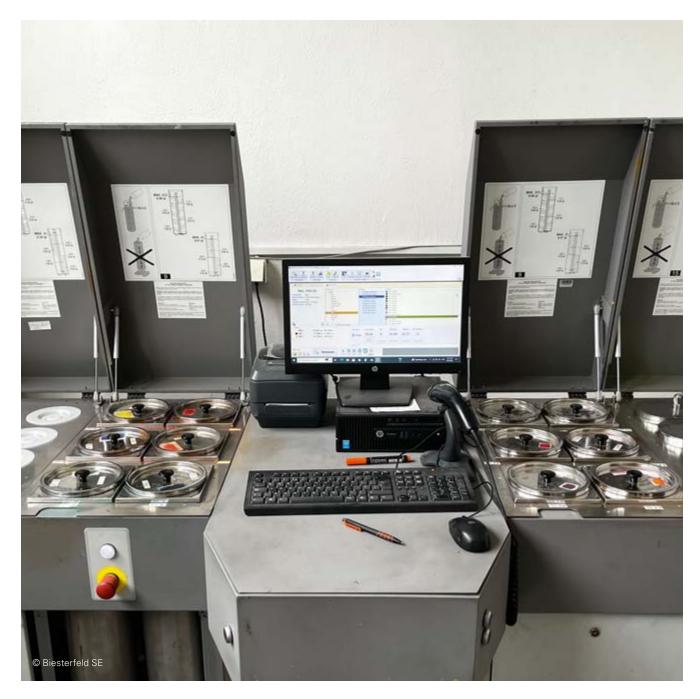
Gelcoat elevates surfaces with a perfect finish and exceptional durability, offering long-lasting protection against environmental elements in a variety of demanding applications.

Product name	Description	Variants available	Markets	Geltime [min]	HDT [°C]
Ecogel S0	Zero styrene spray gelcoat	Limited colours	Wind, Automotive, Transport, Building	5-20	60-70
Ecogel S1	Ultra low styrene gelcoat	Cure system, Limited colours	Wind, Automotive, Transport, Building	15-55	90-100
GC LS 30 Excel	IsoNPG spray gelcoat with superior weathering properties	Colour, Cure system	Marine	5-20	75-85
GC LS 31 Excel	IsoNPG brush gelcoat with superior weathering properties	Colours, Cure system	Marine	5-20	60-70
GC 65	Iso brush gelcoat, available in a wide range of colours	Colours, Cure system	Marine, Industrial	5-30	60-70
GC 97	Iso brush gelcoat, available in a wide range of colours, thixotropic	Colours, Cure system	Marine, Industrial	5-20	60-70
GC 0209	Isophthalic spray gelcoat especially suitable for wind applications, thixotropic	Colours, Gel time	Wind, Industrial, Marine	15-30	70-80
GelTint GT-600*	Iso Brush gelcoat which can be rapidly tinted on GelTint Machines in a wide range of colours	Colours	Industrial, Building, Marine	5-20	70-80
GelTint GT-900*	Iso Spray gelcoat which can be rapidly tinted on GelTint Machines in a wide range of colours	Colours	Industrial, Building, Marine	5-20	70-80
GelTint GT-1000*	IsoNPG spray gelcoat which can be rapidly tinted on GelTint machines in a a wide range of colours	Colours	Industrial, Building, Marine	5-20	55-60
Pigment paste	Styrene free Pigment pastes compatible with Crystic® gelcoats	Colours, Cure system	All	-	-

<sup>\*</sup> Laboratory service: We offer Geltint services in our laboratory, ensuring precise color matching and consistency for your specific needs.

## **On-Demand Color Customization**

Biesterfeld, in collaboration with Scott Bader, offers premium gel tint services using high-quality color pastes and gel coats. Specifically designed for the demands of composite applications, these solutions ensure vibrant, consistent, and durable colors. Perfectly suited for marine, industrial, and lightweight structural components, our tints enhance both the aesthetics and performance of your composite materials.



Scott Bader GelTint machine for customizing the colors of your gelcoats.

## **Biesterfeld Laboratory Services**

The Lab and Innovation Centre is where we work on the products and solutions of tomorrow.

- Development of customer-specific solutions
- Creation of innovative, marketable formulations / end products with our broad portfolio of additives and raw materials
- Product screening of new materials from our suppliers
- Comparative tests







#### **Lab & Innovation Centre**

In our Lab and Innovation Centre in Hamburg we have the possibility to support the development of tailored solutions for and together with our customers.

The Lab allows us to engage intensively with product research and application tests, and it serves as a fully developed training centre.

If you have an idea for a project get in touch:

Composites@biesterfeld.com

Biesterfeld Laboratory Services are continuously expanding to keep pace with technological advancements in key industries and drive innovation. This allows us to offer our clients a wide range of services and events that are precisely tailored to their needs.

Recently, we have expanded our service portfolio in the Composites & Tooling sector, allowing for the application of open processes such as

- Hand-Lay-Up
- Vacuum infusion
- Out-of-Autoclave prepreg methods
- Compression Moulding
- Additive Manufacturing

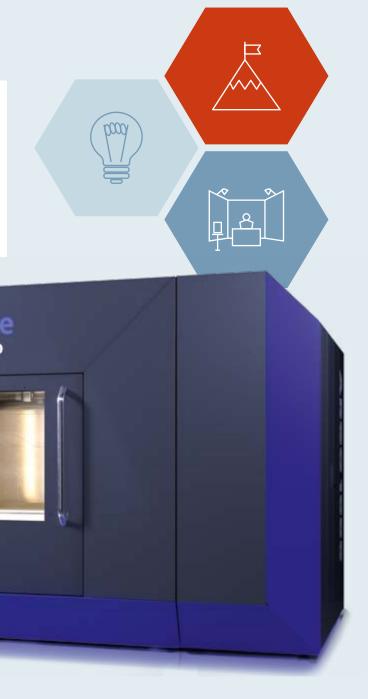
Furthermore, the new Composite & Tooling laboratory will host

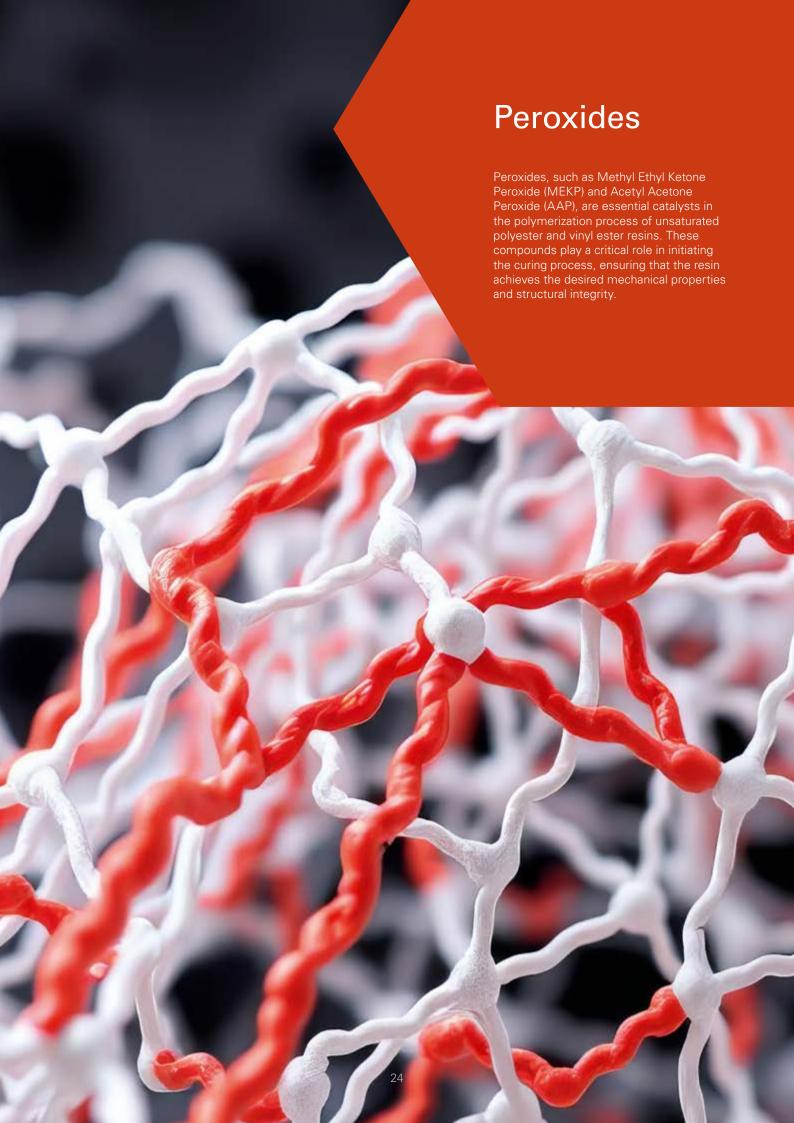
- customized quality control,
- product comparison studies,

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• seminars and in-house exhibitions.

Renowned and carefully selected suppliers will also be involved in the latter, ensuring maximum benefit and expertise for our clients.





# Peroxides



Enhance your polymerization and curing processes with our premium solutions. Our high-quality chemicals are engineered to boost efficiency and ensure superior product performance.

	Product name	EINECS/ELINCS No AO [%]	Assay [%]	SADT [°C]	Diluent	Physical from	Stor tem ratu	pe-	Putties	Button	Anchor and bold	Coating	Gelcoat	Hand lay up, spray up	Polymer concrete	RTM	Centrifugal casting	Continuous laminating	Filament winding	Hot Press moulding	Pultrusion	Acrylic	Vinylester resin
	MEKP (Met	hyl Ethyl Ke	etone Pe	roxi	de)																		
	AKPEROX® A1	9,40 - 9,60	33 - 37	60	DMP	Colorless, Liquid	30	30					✓	✓	✓		✓		✓				
	AKPEROX® A2	8,90 - 9,10	33 - 37	60	DMP	Colorless, Liquid	30	30						✓	✓		✓		✓				
	AKPEROX® A10	9,90 - 10,10	34 - 36	60	DMP	Colorless,	30	30		<b>√</b>		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				<b>(√)</b>
	<b>AKPEROX</b> ®	5,50 - 5,60	15 - 35	60	DMP	Liquid Colorless,	30	30		<b>√</b>		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				<b>(✓)</b>
	A30 AKPEROX®	8,90 - 9,10	30 - 37	60	DMP	Liquid Colorless	30	30		<b>√</b>		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				( <b>✓</b> )
	A50 AKPEROX®	9,90 - 10,10		60	DMP	Liquid Colorless,	30	30		<b>√</b>		<b>√</b>	<b>√</b>	<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	✓				( <b>✓</b> )
	A60 AKPEROX®	8,80 - 8,99	30 - 37	60	DMP	Liquid Colorless,	30	30		<b>√</b>		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				( <b>✓</b> )
ride	A50G AKPEROX® A60G	9,90 - 10,10	34 - 36	60	DMP	Liquid Colorless, Liquid	30	30		<b>√</b>		<b>√</b>	<b>√</b>	<b>✓</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>				<b>(√)</b>
Pero	AKPEROX® A5R	8,80 - 8,99	33 - 37	60	TXIB	Colorless, Liquid	30	30		<b>√</b>		<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	✓				<b>(√)</b>
Organic Peroxide	AKPEROX® LPT-N	8,40 - 8,60	34 - 36	60	DINP	Clear, Liquid	25	25					✓	✓		✓			✓				✓
Org		hyl Isobutyl	Ketone	Perd	oxide)	Liquid																	
	AKPEROX® MIKP	10,00 - 10,50	43 - 47	50	Isodo- decane	Colorless, Liquid	25	5		✓							✓	✓	✓				✓
	AKPEROX® MIKP-S	8,70 - 8,90	43 - 47	50	Isodo- decane	Clear, Liquid	25	5											✓		<b>✓</b>		
	AAP (Acety	lacetone Pe	eroxide)			·																	
	AKPEROX® AAP	4,00 - 4,20	33 - 35	60	Diace- tone Alcohol	Colorless, Liquid	25	-10					✓	✓	✓	✓	✓	✓	✓				
	Blend Type	Peroxides (	MEKP+	<b>AAP</b>																			
	AKPEROX® ER33	7,60 - 7,90	33 - 35	55	-	Clear, Liquid	25	-5								✓	✓	✓	✓				
	AKPEROX® ER34	6,50 - 6,80	33 - 35	55	-	Clear, Liquid	25	-5								✓	✓	✓	✓				

	Product name	EINECS/ELINCS No AO [%]	Assay [%]	SADT [°C]	Diluent	Physical from	Stortem ratu	pe-	Putties	Button	Anchor and bold	Coating	Gelcoat	Hand lay up, spray up	Polymer concrete	RTM	Centrifugal casting	Continuous laminating	Filament winding	Hot rress moulding	Pultrusion	Acrylic	Vinylester resin
ide	Blend Type Peroxides (t-Butyl Peroxybenzoate and AAP)																						
Organic Peroxide	AKPEROX® ER59	3,20 - 3,80	25 - 35	60	Diace- tone Alcohol	Clear, Liquid	25	-5								<b>(✓)</b>	✓	✓	✓				
Organ	AKPEROX® ER60 FW	4,30 - 4,70	25 - 35	60	Diace- tone Alcohol	Clear, Liquid	25	-5								<b>(√)</b>	✓	✓	✓	(✓)	✓	✓	✓
	Cobalt(II) 2	-Ethylhexan	oate																				
Organic Peroxide	AKCOBALT® 0,5 - 12 %	205-250-6	-	-	Styrene, Toluene, TXIB, Xylene	Violet Blue, Liquid	30	5	✓	✓	✓	<b>✓</b>	✓	✓	✓	✓	✓	✓	✓				

 $<sup>\</sup>checkmark$  = Recommended application

Peroxides are indispensable catalysts in composite manufacturing, enabling the curing process of unsaturated polyester and vinyl ester resins. AKPA offers a comprehensive range of high-quality peroxides, tailored to meet the specific needs of various composite applications, ensuring consistent curing and optimal end-product performance.

AKPA's portfolio includes Methyl Ethyl Ketone Peroxide (MEKP) and Acetyl Acetone Peroxide (AAP), among others. MEKP is widely used for hand lay-up, spray-up, and other open-mold processes, thanks to its reliability and consistent reactivity. AAP, with its controlled curing profile, is ideal for advanced manufacturing methods, including pultrusion and infusion processes, offering excellent resistance to extreme conditions.

With AKPA's peroxide solutions, manufacturers can rely on efficient curing, precise processing, and high-performance results across a wide range of composite applications.

 $<sup>(\</sup>checkmark)$  = Possible application







Roll width [mm]	Roll lenght [m]	Fibre type
500 - 2500*	25 - 100 **	SM45, IM56

Product Description		Areal weight [gsm] Thermoplastic contents [wt%]		Tensile modulus [GPa]		Compression strenght [MPa]		
			Trans.	Long.	Trans.	Long.	Trans.	Long.
G-TEX TM	recycled carbon fiber/ thermoplastic nonwoven mats	100 - 500*	300	200	30	20	190	170
G-TEX M	100% recycled carbon fiber nonwoven mats.	50 - 500*	330	290	35	25	330	270

Product	Compres		Flexural [M	strenght Pa]	Density [g/m³]		Density [g/m³]		Density [g/m³]		Processes	Application
	Trans.	Long.	Trans.	Long.	Trans.	Long.						
G-TEX TM	25	20	300	210	1,	06	dry mats can be direct formed into parts compres- sion moulding or used as pre-consolidated sheets	automotive, aerospace				
G-TEX M	30	20	500	370	1,	51	compression moulding processes, vacuum infusion (dry mats), autoclave (pre- impregnated mats)	automotive, wind energy, marine, tooling application				

<sup>\*</sup> contact sales for other requirements

<sup>\*\*</sup> depends on areal weight



Production process of carbon non-woven fabrics.





#### THE FIRST 100% RECYCLED GLASS FIBER PRODUCT FOR ADVANCED APPLICATIONS

Our recycled Nonwoven GF from Infinici sets new standards in composite materials. By utilizing recycled glass fiber trim, we not only prioritize top quality but also eco-friendly manufacturing. Our commitment goes further: we collect glass trim waste and recycle it back into the value chain. Robust, versatile, and sustainable – Nonwoven GF 650 is the perfect choice for your demanding applications. With our products, you not only meet customer demands but also contribute to a greener future.

Product	Description	Area weight [g/m²]	Material	Fiber orientation	Roll width	Roll	Inner / outer core diameter	Validated processes
Infinici Nonwoven GF	recycled glass fiber mat, two different sides, on one side – smaller glass fiber brushes protrude	500, 650, 800	E Glass / ECR Glass	Isotropic	1,5 m	80 m	175,5 mm / 196,5 mm	RTM Light, RTM, SMC



Made from 100% recycled glass fiber



Designed for RTM, RTM Light & RTM high pressure



Reduces CO<sub>2</sub> footprint by >95%<sup>1</sup>











#### **Sustainable Resins**

Product name	Product description	Variants available	Markets	Geltime [min]	HDT [°C]
Crystic® \$\frac{1}{2}\$	Bio content polyester resin	Geltime, Viscosity	Industrial, Building, Pipe	10-30	70-75
Crystic® \$\frac{1}{2}\$	Bio content polyester resin (>30%)	Geltime, Viscosity	Industrial, Building, Pipe	-	-
Crestafire® Sio P1-8001	100% Plant-based resin (carbon neutral) capable of meeting EN45545-2 HL3	Cure system	Transportation, Building, Construction	-	-

# SCOTT BADER

#### **Sustainable Urethane Acrylate Structural Adhesives**

Product name	Description	Appea- rance	Working time [min]	*Fixture time [h]	Tensile strenghth [Mpa]	Tensile modulus [Mpa]	elongation	Specific gravity [g/mL]
Orestoniei	Excellent adhesion to FRP material, surface must be free of dust and grease	Mauve Gel	85	4	27 - 30	1500 - 1900	>40%	1,05

<sup>\*</sup> Time taken at 23 °C to achieve 1,4 MPA strengthin lap-shire tests according to BS ISO 4587



#### **Sustainable Flax Non-Crimp Fabrics**

Biobased Flax NCFs from Saertex bring sustainable innovation to lightweight construction, reducing  $\mathrm{CO}_2$  emissions with renewable flax fibers. Ideal for applications in sports, marine, and automotive industries, these multiaxial fabrics enhance the eco-friendliness and visual appeal of composite materials. Flax NCFs offer excellent drapability for complex shapes, easy resin impregnation, and a natural, attractive finish. Sourced from top flax supplier Terre de Lin, they ensure consistent quality and reliable supply. Compatible with various resins, these fabrics provide strong mechanical properties and added comfort through superior damping – ideal for boats, vehicles, and more. Join us in building a resource-saving future.





## Fiberglass products



JUSHI, a global leader in glass fiber production, offers a comprehensive range of glass mats and rovings designed to meet the diverse needs of composite manufacturers. Known for their quality, consistency, and innovative technology, JUSHI products are widely used across industries such as automotive, marine, construction, and wind energy.

JUSHI's glass products deliver excellent tensile strength, durability, and compatibility with various resin systems, making them ideal for processes like Resin Transfer Molding (RTM), filament winding, pultrusion, and infusion. Their glass mats, available in chopped strand and continuous strand configurations, provide superior reinforcement for a variety of applications, ensuring excellent laminate properties and ease of processing.

Whether you are producing lightweight structures, durable components, or high-performance composites, JUSHI's glass mats and rovings offer reliable solutions to enhance your manufacturing processes and product performance.

Product group	Description	Avaiability	Certificates
Fiberglass Mat	The emulsion- or powder-bonded glass fiber mats can be used for common processes such as hand lay-up, infusion or continuous processes. They are quickly saturated and can be used with standard resins.	100-900 g/m <sup>2</sup> powder or emulsion compound	Lloyd's Register DNV
Chopped Strand Roving	Chopped strand roving with a silane coating is easy to cut and offers very good impregnation. Depending on the type, they are suitable in combination with polyester, vinyl ester and epoxy resins. They are mainly used in the fiber spraying sector.	300-3000 tex	DNV
Direct Roving	Direct rovings, treated with a silane sizing, ensure optimal adhesion to common matrix resins. They are suitable for pultrusion and filament winding processes for the production of pipes, pressure vessels, and tanks.	200 - 9600 tex	GL
Woven Fabric	Bi-directional fabrics offer excellent mechanical properties and are versatile due to the wide range of possible areal weights. The high-performance reinforcements are commonly used in hand lay-up processes for manufacturing components in industries such as marine, aerospace, wind energy, and automotive.	200-1600 g/m²	Lloyd's Register DNV

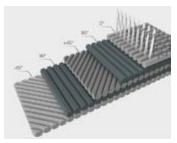




## **Non-Crimp Fabrics**

Non-Crimp fabrics (NCF) from our supplier Saertex include many types of fabrics sewn to a grammage of 4000 g/m² with different fiber orientations (0°, 90°, +/-45° and between -22.5° and +22.5°). Fabrics are produced to a maximum width of 3810 mm. They are compatible with most resins available on the market: EP, UP, VE, PUR, PP, PA and produced from various types of fibers: glass, carbon and aramid.

All NCFs are dedicated to various processing methods such as hand lamination, infusion, RTM, pressing, winding, pultrusion, prepregs and offer a customized drapability according to the customers needs.



Picture: SAERTEX GmbH & Co. KG

### **Glass Non-Crimp Fabrics**

Product name	Fiber orientation	Weight [g/m²]	Length and weight on roll
B-E-631g/m - 1300mm	0°/90°	631	60m / 50kg
B-S-E-931g/m - 1300mm	0°/90°/CSM	931	40m / 50kg
B-E-846g/m - 1300mm	0°/90°	846	46m / 50kg
U-E-591g/m - 1200mm	0°	591	70m / 50kg
U-E-1200g/m - 1300mm	0°	1200	32m / 50kg
X-E-296g/m - 1270mm	+45°/-45°	296	50m / 19kg
X-E-444g/m - 1270mm	+45°/-45°	444	100m / 50kg
X-E-612g/m - 1270mm	+45°/-45°	612	65m / 50kg
X-E-812g/m - 1270mm	+45°/-45°	812	50m / 50kg
X-S-E-1109g/m - 1270mm	+45°/-45°/CSM	1109	35m / 50kg
X-E-988g/m - 1270mm	+45°/-45°	988	40m / 50kg
X-E-1212g/m - 1270mm	+45°/-45°	1212	35m / 50kg
Y-E-625g/m - 1270mm	0°/-45°/+45°	625	50m / 40kg
Y-E-837g/m - 1270mm	0°/-45°/+45°	837	50m / 50kg
Y-E-915g/m - 1270mm	0°/-45°/+45°	915	40m / 47kg
Y-E-1217g/m - 1270mm	0°/-45°/+45°	1217	30m / 45kg
Q-E-820g/m - 1270mm	0°/-45°/90°/+45°	820	50m / 50kg
Q-E-1232g/m - 1270mm	0°/-45°/90°/+45°	1232	30m / 47kg

#### **Carbon Non-Crimp Fabrics**

Product name	Fiber orientation	Type of fiber	Length on roll [m]
U-C-314g/m -1230mm	0°	ZOLTEK PANEX 35 50K	50
U-C-603g/m -1230mm	0°	ZOLTEK PANEX 35 50K	50
U-C-882g/m - 500 mm	0°	ZOLTEK PANEX 35 50K	50
X-C-218g/m -1400mm	-45°/+45°	TORAY T700 SC 50C 12K	50
X-C-305g/m -1270mm	-45°/+45°	TORAY T700 SC 50C 12K	50
X-C-405g/m -1270mm	-45°/+45°	MITSUBISHI TRW40 50K	50
X-C-605g/m -1270mm	-45°/+45°	MITSUBISHI TRW40 50K	50
Q-C-816g/m -1270mm	-45°/90°/+45°/0°	GRAFIL 34-700 12K	50







## **RTM Fabrics**

For elements that require higher strength, a new type of fabric has been designed, known as SAERcore MAX, with additional reinforcement in the form of a multi-directional fabric. The use of sewn fabrics makes these fabrics more permeable, they drape better, and their strength parameters are higher than those of woven fabrics.

Product name	Application	Components	Standard width [mm]	Made-to-order width [mm]
SAERcore	RTM, RTM light, compression / cold mould process	CSM - from 150 to 1000 g/m <sup>2</sup> Flow medium - PP13, PP18, PP20, PP25	1250, 2500	150 to 3200
SAERcore with improved flow	RTM, RTM light, compression / cold mould, vacuum infusion	CSM - from 150 to 1000 g/m <sup>2</sup> Flow medium - PP25HF, KP3, KP5	1250, 2500	150 to 3200
SAERcore MAX	RTM, RTM light, compression / cold mould process	CSM - from 150 to 900 g/m <sup>2</sup> Flow medium - PP13, PP18, PP20, PP25, Multiaxial fabric UD, BX, BD, TX, QX glass, carbon, aramid	1250	150 to 2500
SAERcore MAX with improved flow	RTM, RTM light, compression / cold mould, vacuum infusion	CSM - from 150 to 900 g/m² Flow medium - PP25HF, KP3, KP5 Multiaxial fabric UD, BX, BD, TX, QX glass, carbon, aramid	1250	150 to 2500



A close-up of SAERfoam reveals its unique structure, combining lightweight foam with integrated reinforcements for enhanced strength and efficiency in composites.



#### Structural Flow Media

The use of fabrics together with a flow medium in infusion and RTM processes allows for the acceleration of processes by about 30%, while at the same time eliminating the possibility of potential errors related to the arrangement of external meshes or tapes distributing the resin.

The flow medium remaining in the laminate simultaneously constitutes its reinforcement. It contains >75% glass content with a resin intake of about 0.8 kg/m. For ease drapability it includes a chopped strand mat 150 g/m<sup>2</sup>.

The flow medium can be sewn onto any fabric, which additionally speeds up production.

Product name	Application	Description	Thickness [mm]	Width [mm]
SAERflow BX 304	RTM, RTM light, vacuum infusion	The fabric consists of 75% glass, synthetic material and 150g CSM glass mat	0,9 mm	1270 to 2540



A close-up of SAERflow highlights its optimized structure, ensuring superior resin distribution for seamless and high-quality composite manufacturing.



#### **Fabric adhesives**

SAERfix speeds up production and is a mechanically applied glue to the fabric surface, the purpose of which is to temporarily attach it to the mold in the infusion process or in RTM. It is compatible with all resin systems and offers better resistance to osmosis

Applying spray adhesives during the production process of the fabric causes it to be evenly distributed on the fabric surface, which in turn speeds up the production of final parts.

Product name	Compatibility	Description	Aplikacje	Width [mm]
SAERfix EP	Epoxy systems	The adhesive is applied to glass, carbon, aramid, has a GL certificate, customized weight g/m²	RTM, RTM light, vacuum infusion	up to 2540
SAERfix UP	Polyester systems	The adhesive is applied to glass, carbon, aramid, has a GL certificate, customized weight g/m²	RTM, RTM light, vacuum infusion	up to 1270

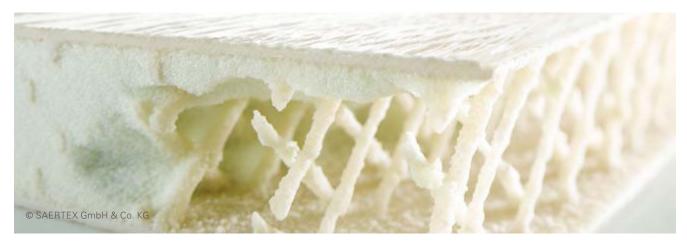




#### **SAERfoam**

**SAERfoam** is an innovative lightweight core material designed to replace traditional cores like PVC, PET, and balsa. Combining ultralight foam with 3D glass fiber reinforcements, SAERfoam offers customizable mechanical properties and excellent weight savings. It's available in thicknesses from 10mm to 30mm and works with most resins, making it highly adaptable for various applications, including boatbuilding, rail, and construction. With a high shear modulus, SAERfoam minimizes deflection and thickness, reduces resin consumption in curved designs, and prevents water absorption. This flexible, cost-effective material is easy to cut, stable, and ideal for curved, durable structures.

Designation	Density [kg/m³]	Resin intake [kg/m³]	Application	Sheet dimensions (width x length) [mm]	Thickness [mm]	Sheets per box
					10	75
			RTM, RTM light,		15	55
SAERfoam® 60	65	2,25	Vacuum infusion	1200 x 1200	20	45
					25	37
					30	30
					10	75
			RTM, RTM light,		15	55
SAERfoam® 80	85	1,9	Vacuum infusion	1200 × 1200	20	45
			vacuum musion		25	37
					30	30





A close-up of SAERfoam, the innovative core material combining lightweight performance with exceptional strength for advanced composite applications.

### Core materials



MyCell® PVC from our supplier Marex Composites are closed-cell foams made of PVC for lightweight construction. They can be used in the most common processes (hand lay-up, prepreg up to 80°C (PVC HT up to 140°C) injection/infusion process). Typical applications can be found in the marine, transport, wind energy and aviation industries for ship decks, interiors, rotor blades and aircraft fuselages.

		PVC foams								resistant oams
Properties	M040	M048	M060	M080	M100	M130	M200	M250	H060	H080
Density [kg/m³]	40	48	60	80	100	130	200	250	60	80
Compressive strength [MPa]	0,46	0,66	0,92	1,36	1,86	3,07	5,26	6,79	0,92	1,29
Compressive modulus of elasticity [MPa]	36	45	69	92	134	162	296	370	66	88
Tensile strenght [MPa]	0,71	1,03	1,54	1,92	2,69	4,2	5,27	5,69	1,62	2,11
Tensile modulus of elasticity [MPa]	27	47	65	87	125	155	287	365	66	86
Shear strenght [MPa]	0,46	0,69	0,95	1,37	1,64	2,57	3,88	5,01	0,93	1,32
Shear modulus [MPa]	12	15	19	28	35	48	66	95	20	26
Elongation at break [%]	9	12	27	30	34	45	48	49	33	39
Thermal conductivity [W/mK]	0,031	0,031	0,031	0,035	0,035	0,039	0,048	0,05	0,031	0,036
Dimension [mm] lenth	2850	2730	2450	2180	2050	1900	1600	1500	2400	2150
width	1330	1270	1150	1020	950	850	750	700	1120	1005
depth	3-84	3-80	3-78	3-70	3-64	3-51	3-48	3-47	3-78	3-75





PVC foam cores in a variety of densities and surface options: plain, grooved and perforated - tailored for diverse composite applications.

# **Degree of processing**

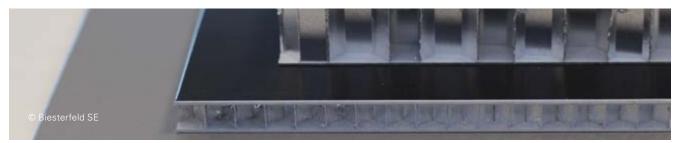
Plain	This is the simple panel, which is not provided with a cutting pattern or perforation.	
Plain	This is the simple panel, which is not provided with a cutting pattern or perforation.	
Double Cut	With double cutting, both sides of a foam are cut crosswise by up to 50% according to the thickness. This significantly increases flexibility. In addition, the channels enable an optimum resin flow and excellent ventilation.	
Grid Scored	Balsasud cores and foams can be processed into grid fabrics. In this process, the core material is bonded with a glass fabric, and the cut runs diagonally through the core material, penetrating it completely. This configuration enables maximum flexibility.	
Perforation	With perforation of the balsa cores and foams, optimal ventilation and excellent resin flow are achieved. Various perforation patterns are available.	• • •
Parallel Grooves	Parallel grooving of the balsa brew cores and foams enables easier resin flow and easier deaeration of the laminate.  Parallel grooving is possible on both surfaces.	
Crosswise Grooves	With crosswise grooving, the effect of parallel creasing is intensified. Crosswise grooving is available for balsa brew cores and foams. Cross grooving is possible on both surfaces.	
Vaccuum Infusion	The vacuum infusion cut is available for foams and balsa brew cores. The cross grooving on one or both sides in combination with perforation enables the best resin flow and excellent deaeration of the laminate during vacuum infusion.	

### **Aluminum honeycombs**



Luxpanel International offers lightweight aluminum panels with a honeycomb structure (LUXCORE), ensuring exceptional stability and minimal weight. Perfect for construction, transportation, and design, these panels combine strength with efficiency.

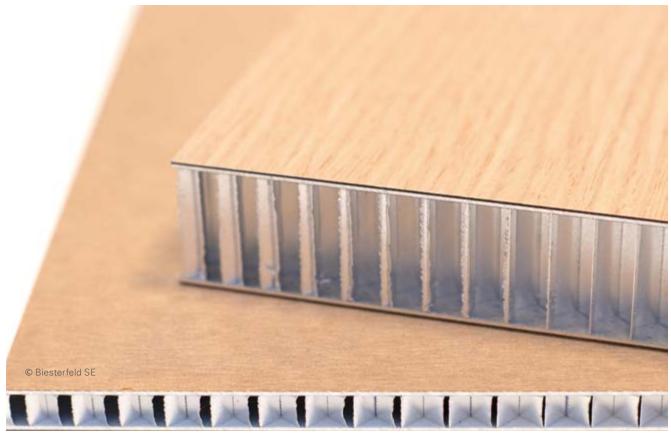
Product name	Description	Panel thick-ness	Skin sheets	Cell width [mm]	Panel lenght* [mm]	Application
Luxboard A	Cover skin on both sides, extra- ordinary stability, extreme light weight, certified as non-consu- mable material	3-50	0,5/1,0 mm Al 5754 H48 **	6,4; 9,6; 12,7	15.000	Truck trailer industry, offshore constructions, architecture (DIN EN 13501-1), machine construction, building industry and other industry segments with high stable lightweight panels
Luxboard A/2	Cover skin on one side, other cover skin is porvided as a loose panel sheet, gaining a one-axis flexible product for bended appliance	>1.500	0,5 mm Al 5754 H48	6,4	3.000	Wind energy, caravan interior, column trim, architecture (DIN EN 13501-1)
Luxboard D	Continuous pressed laminate (CPL) is bonded as a cover sheet on both sides, for coatings with real wood veneers	6-19*	0,4 mm CPL Laminate	6,4; 9,6	variable	Wall panels, train construction, ceiling panles, flooring panels
Luxboard A-Decor	Based on Luxboard A, can be coated with decorative materials (HPL, CPL, foil)			For deta	ails see Lu	ixboard A
	Based on Luxboard A with a color coated top layer			For deta	ails see Lu	ixboard A
Luxboard A-QA	Covered with sound absorber skin, working on the principle of "Helmholtz resonance" reaches an astonishing absorbing coefficient in low frequencies, results achieved with heavy material combinations	>50	Top: Alu cover skin, one side perforated, coated with PVDF RAL 9010. Hole pattern: Rv 0,7-9,5; free hole area amount Ao = 0,5% Bottom: Alu-Cover skin, coated with RAL 9010	6,0; 10,0; 15,0; 19,0	>15.000	Music production, ceiling panels



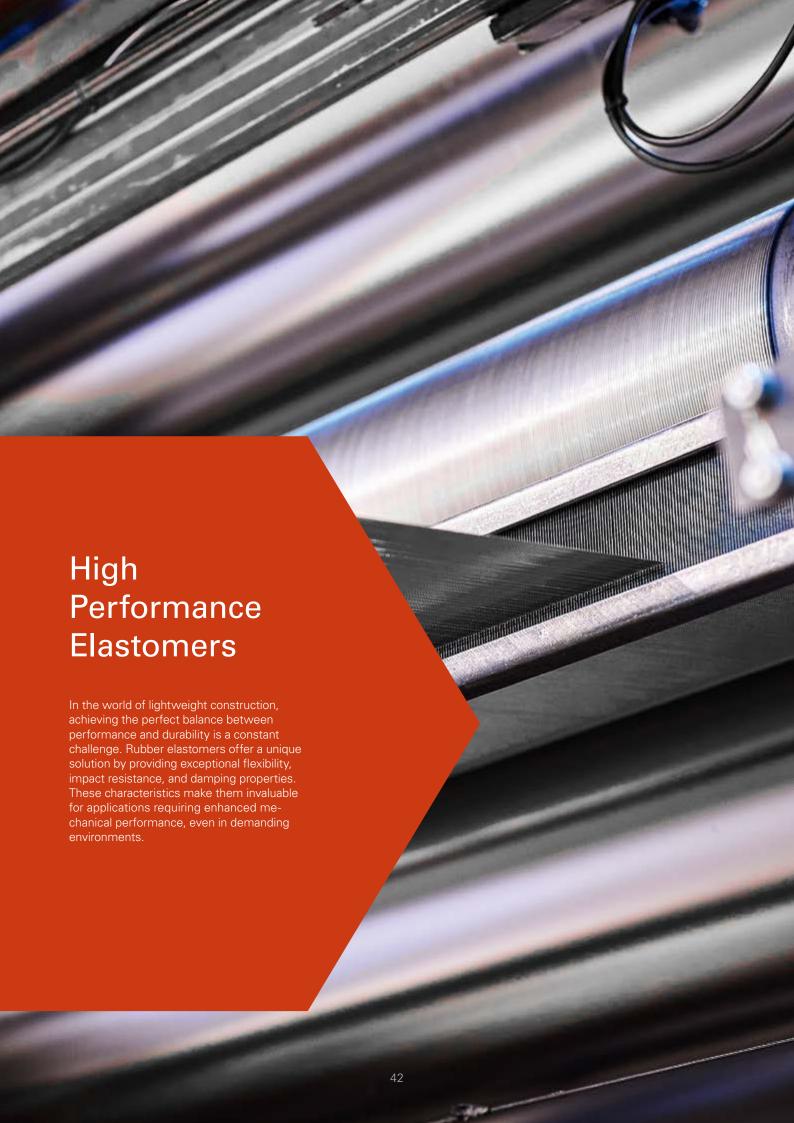
Aluminium honeycomb panels with skin covers offer exceptional rigidity, lightweight performance, and durability – ideal for demanding composite applications.

Product name	Description	Panel thick- ness	Skin sheets	Cell width [mm]	Panel lenght* [mm]	Application
Luxboard W	Hybrid sandwich panel, Alu honeycomb cores and wooden cover panels, combines high flexural stiffnes and lightweight	variable	Customer- specific combina- tions of Alu and wood materials	6,4; 9,6	2440	Ceiling panels, wall panels, floor panels
Luxcore	Alu honeycomb (EN-AW 3003), available expanded or unexpanded, certified as a "non-combustible" material according to FTP-Code 2010, fulfils the fire protection requirements R1, for hazard level HL3 according to DIN 45545-2	70	1,5 - 4,5 MPa	6,4; 9,6; 12,7	38-80	Core material for sandwich panels, used in marine, trans- portatio & rail, mechanical engineering to construction and architecture

<sup>\*</sup> individual length is possible
\*\* other cover skins on request



A close-up of aluminum honeycomb showcases its lightweight structure and exceptional strength, delivering optimal performance for advanced composite designs.



#### **KRAIBON®**

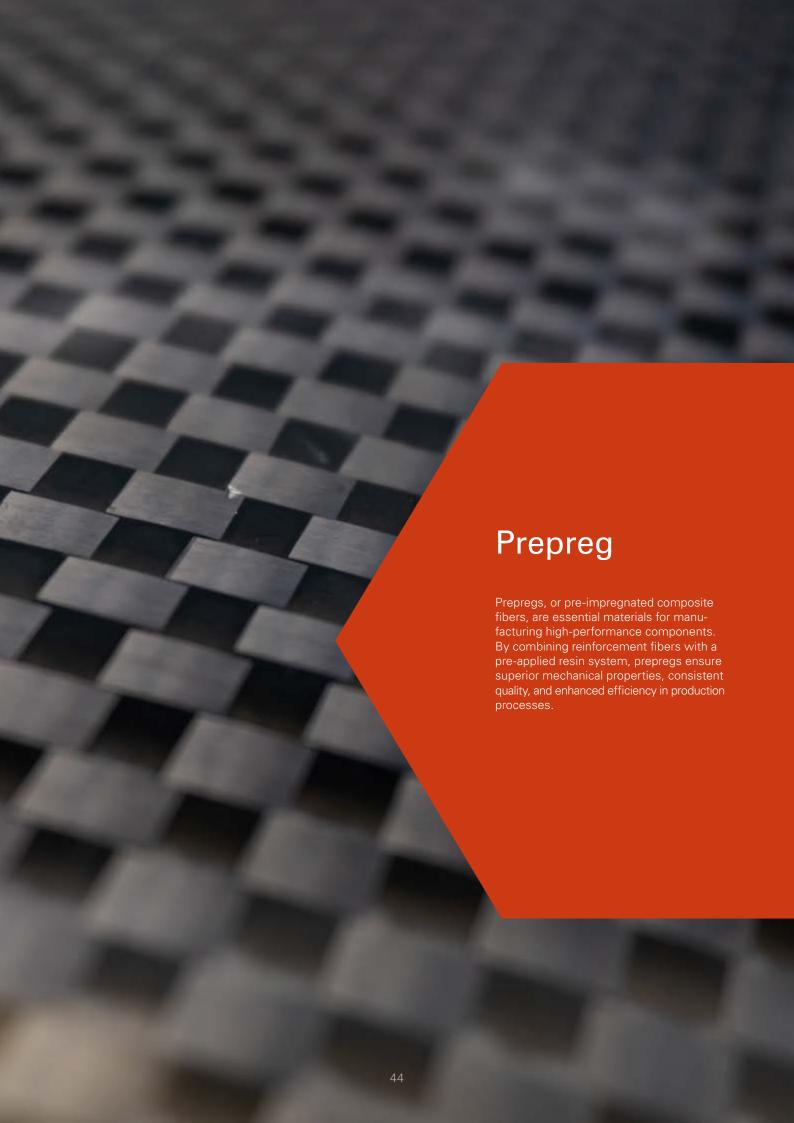


KRAIBON® is a revolutionary product line developed by KRAIBURG specifically for use in composite materials. These innovative materials combine properties of rubber with the strength and lightweight nature of fiber composites. KRAIBON® products offer a variety of benefits, including excellent damping characteristics, noise reduction, and increased impact resistance.

KRAIBON® products find applications in various high-tech industries such as automotive, aerospace, and sports and leisure. The use of KRAIBON® leads to significantly improved structures and longer lifespan of end products. Additionally, they enable innovative design possibilities and contribute to reducing overall weight, particularly in the automotive industry, enhancing energy efficiency.

KRAIBURG sets new standards in material technology with KRAIBON®, offering tailored solutions perfectly suited to the requirements of our customers. Trust KRAIBON® for your advanced applications and benefit from the unique combination of flexibility, durability, and lightweight properties.

				Technical data					Din	nensio	ons			meno g cyc		
Product code	Brand name	Benefits	Color	Tensile strength [Mpa]	Elongation at break [%]	Hardness [shore A]	Tear strength [N/mm]	Temperature resistance [°C]	Density	Standard thickness [mm]	Width [mm]	Length [m]	Temperature [°C]	Pressure [bar]	Processing time [min]	Cure time [min]
HVV9632/59	KRAIBON® Hybrid	Multi material bon- ding, high impact energy absorption, splinter protection	Yellow	16,0	49	95	5,3	170	170	0,5	500	20			3,0- 0,3	16,0- 0,9
SVV9632/90	KRAIBON® Hybrid	Multi material bon- ding, high impact energy absorption, splinter protection	Black	15,4	45	98	4,0	170	170	0,5	500	20		2,7- 8,2	3,0-	16,0- 0,9
AA6CFZ	KRAIBON® Impact (soft)	High impact energy absorption, splinter protection, ductile failure pattern	Black	8,1	310	64	3,0	120	120	0,5	500	20		,	9,0-	240- 3,3
AA9KFZ	KRAIBON® Impact (hard)	High impact energy absorption, splinter protection, ductile failure pattern	Black	11,1	129	89	3,0	140	140	0,35	1000	10	110- 150	1,4- 4,8	9,0-	240- 3,3
SAA1165/74	KRAIBON® Impact	High impact energy absorption, splinter protection, ductile failure pattern	Black	8,9	235	75	5,0	130	130	0,35	1000	10		,	9,0-	240- 3,3
UT7CFZ	KRAIBON® Damp	Structure-borne noise insulation	Black	6,7	360	76	9,6	150	150	0,5	500	20			5,3- 0,5	70- 8,4
VA6BOZ	KRAIBON® Temp	High Temperature Resistance (280 °C), chemical resistance, noise insulation	Black	11,9	336	62	5,9	280	280	0,5	500	20	120- 170			90-
HHZ3662/61	KRAIBON® Fire	Fire Protection (EN 45545:2), high impact absorption	Black	5,1	132	91	8,0	280	280	0,5	500	20	100- 170		6,9- 0,2	287- 1,7
HHZ3662/60	KRAIBON® Fire	Fire Protection (EN 45545:2), high impact absorption	White	5,1	132	91	8,0	280	280	0,5	500	20			6,9- 0,2	287- 1,7





# **Prepregs**

Prepregs from our partner SYENSQO are ready-to-use systems that are processed without further addition of fiber reinforcement or resin. As pre-impregnated fibers or fabrics, prepregs include homogeneously distributed fibers with a resin system in which the curing agent is already contained. The balanced ratio of fibers reinforcement and resin content, which is almost individually adjustable, leads to a simplified processing and increases the product quality compared to the regular processing. In addition, the consistent quality and individually controllable layer thickness allow the use of prepregs for series production.



Rising Demand for Composites in Aviation: Our prepregs meet the highest aviation standards, delivering lightweight strength and exceptional performance for the skies.

Cate- gory	Resin system	Description	Resin type*	Service temp [°C]	Cure temp [°C]	Cure time [min]	Tg [°C]
Low tempera- ture	LTM® 110	For larger structures, we recommend	CN	250	70-250	1200	330
Low mper ture	LTM® 26ELB	our LTM® prepregs, which offer	EP	70 - 150	60	480	180
te	LTM® 45EL	outstanding mechanical properties	EP	>150	60	720	210
	MTM® 110		CN	250	70-250	120	330
	MTM® 248S		EP	-	125	60	100
<u>r</u> e	MTM® 28-1		EP	80	120	60	100
ato	MTM® 348FR	Our MTM® prepregs are designed	EP	150	80 - 180	-	170-180
e 7.	MTM® 44-1	for both industrial and aerospace	EP	>150	130-180	120	190 dry / 150 wet
du	MTM® 45-1	applications, with a	EP	>150	80-180	120	180 dry / 160 wet
ter	MTM® 46	cure range of 80 to 250°C. With	EP	>150	80-180	90	190 dry / 180 wet
Ξ	MTM® 49-3	exceptional strength and durabi-	EP	150	80-180	90	190 dry / 115 wet
.3	MTM® 56-2FRB	lity, MTM® is perfect for applica-	EP	100	80-150	10	120 dry
Medium temperature	MTM <sup>®</sup> 57	tions where performance is key.	EP	150	80-150	60	125 dry
2	MTM® 57FR		EP	150	80-150	60	125 dry
	MTM® 58B		EP	150	120-150	60	140 dry / 95 wet
	MTM® 58FRB		EP	150	120-150	60	140 dry / 95 wet
High tempera- ture	HTM <sup>®</sup> 110	If you need a high-temperature	CN	250	-	-	330
High mpera	HTM® 131	structural material, our HTM® pre-	EP	150	135	90	400
	HTM® 60	pregs are perfect for your needs.	EP	205	180	120	230 dry / 155 wet
Ė	VTF 243FRB	Our VTM® prepregs offer a variable	EP	70 - 170	65-150	45-960	177
Te Te	VTM® 243FR	temperature range of 65 to 180°C,	EP	150	65-150	45-960	177
riable Tei perature	VTM® 244FRB	making them perfect for large-scale	EP	150	65-180	45-960	177
Variable Tem- perature	VTM <sup>®</sup> 264	structures in the marine or renew-	EP	100	65-120	60-300	120
>	VTM® 264 FRB	able energy markets.	EP	100	65-120	60-300	120
4	CYCOM® 2020		EP	>150	80-180	60	155
raf	CYCOM® 2040		EP	>150	180	120	200
ī	CYCOM® 2400-1		PH	>150	93-121	120	138
Sai	CYCOM® 5250-4	Cycom® is the perfect solution	BMI	>150	177	360	287 dry / 233 wet
ar)	CYCOM® 5575-2	for primary and secondary aircraft	CN	>150	177-227	240-360	260
ilit	CYCOM® 5577-1	structures, as well as	CN	>150	177	180	260
m bre	CYCOM® 6070	interior applications. With ex-	PH	>150	138-160	60	0.0
pu pé	CYCOM® 7701	cellent weight-saving and cost	EP	150	121	90	88
rcial and military a	CYCOM® 7668	benefits, Cycom® provides	EP EP	150 <160	177 121	90 180	160 119 wet
cia		sycom® 950-1 superior strength and durability			177	120	
q	E CYCOM® 977-2 fuel consumption.		EP	<160			149 dry / 93 wet
E			EP EP	<160 <160	177 177	180 360	212 dry / 156 wet 204 dry / 168 wet
on	CYCOM® 977-3			150	177		138 dry / 104 wet
0	CYCOM® 977-6		EP EP		177	300 120	
	CYCOM® 997		EP	>150	1//	120	177 dry / 132 wet

<sup>\*</sup>BMI: Bismaleimide, CN: Cyanate ester, EP: Epoxy, PH: Phenolic

									Α	pplic	catio	n						
				ro- ace	D	efen	ce		M	otor	spoi	ts		Rail- way	Ma	rine	Ren ab	
Processing method**	Out life at 21 °C / days	Features	Primary & secondary structures	Interior	Vehicle structure	Rotor blades	Antenna & radar domes	Aerodynamics	Chassis	Engine/gear box/oil tanks	Impact structures	Suspension	Heat Shield	EN45545-2 FST systems	Sports & leisure	Industrial	Structural parts	Blade skins
Autoclave	3							<b>√</b>	✓	✓		✓						
Vacuum/Autoclave	2-5								✓		✓							
Press/Vacuum/Autoclave	6	-o					✓											
Vacuum/Autoclave	3	FST							✓					$\checkmark$				
Press/Vacuum/Autoclave	30	FST			<b>√</b>		✓											
Press/Vacuum/Autoclave	30	ГСТ							✓	<b>√</b>		✓	<b>√</b>			$\checkmark$	<b>√</b>	<b>√</b>
Press/Vacuum/Autoclave	30	FST	<b>√</b>											<b>√</b>	<b>√</b>			
Vacuum/Autoclave Vacuum/Autoclave	21 21		<b>√</b>															
Vacuum/Autoclave	60		<b>√</b>	,														
Press/Autoclave	60		<b>√</b>	<b>√</b>														
Press/Autoclave	30	FST							<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>	<b>√</b>					
Press/Vacuum/Autoclave	30	101	<b>V</b>													./		
Press/Vacuum/Autoclave	30	FST	./													<b>V</b>		
Press/Autoclave	60	101	V							<b>√</b>								
Press/Vacuum/Autoclave	60	FST	1						1	1								
Autoclave	-		•						<b>V</b>	•	<b>✓</b>							
Autoclave	>14											<b>√</b>						
Autoclave	28								<b>✓</b>		<b>✓</b>							
Vacuum/Autoclave	-	FST					<b>√</b>											
Vacuum/Autoclave	-	FST					✓											
Vacuum/Autoclave	21	FST					✓											
Vacuum/Autoclave	30						✓								✓		✓	
Vacuum/Autoclave	30	FST														✓		
Press/Autoclave	60							✓	✓									
Press/Autoclave	21							✓		✓	✓	✓						
Press/Vacuum/Autoclave	10			<b>√</b>														
Press/Autoclave Press/Autoclave	28 21		<b>√</b>							<b>√</b>								
Vacuum	21		<b>√</b>															
Press/Vacuum/Autoclave	10	FST	<b>√</b>	/														
Press/Vacuum/Autoclave	10	101	<b>√</b>	<b>√</b>														
Press/Vacuum/Autoclave	15		<b>√</b>															
Vacuum/Autoclave	60		V			<b>√</b>												
Autoclave	10		1			V												
Press/Autoclave	10		<b>√</b>															
Press/Autoclave	21		1															
Press/Autoclave	14								<b>✓</b>		<b>√</b>	<b>√</b>						
Press/Autoclave								<b>√</b>		<b>√</b>		<b>√</b>						



#### **High Performance Thermoplastic Composites**

Syensqo's Thermoplastic Composites offer innovative, rapid manufacturing solutions for aerospace, transportation, and structural engineering. Built on over 40 years of experience with Aromatic Polymer Composite (APC) technology, our composites meet stringent aerospace standards and support efficient, cost-effective production. Our APC portfolio includes high-performance carbon fiber PAEK unitapes, capable of operating in temperatures up to 125°C, and is approved for programs like Airbus A320 and Bell Helicopters.

Our APC tapes deliver exceptional toughness, environmental resistance, and durability, making them ideal for demanding applications. With a unique resin-rich surface, they simplify tape placement and integration, reducing manufacturing complexity. They also meet rigorous flame, smoke, and toxicity standards, ensuring safety and longevity, with the added benefit of indefinite room temperature storage.

Syensqo's APC tapes support efficient processes such as Automated Tape Laying, press molding, and welding, allowing faster, streamlined part production and assembly. With these thermoplastic composites, Syensqo empowers industries to advance manufacturing speed and performance in transportation and beyond.

Product	Features	Catergory	Fiber	Product form		Tg [°C]	Recom- mended consolida- tion [°C]	Application
APC-2-PEEK	High toughness and fatigue resistance and excellent environmental resistance with very low flammability and smoke toxicity	Thermo- plastic Prepregs	Standard Modulus AS4 12k		145 (34% resin content)	143	15-30 min at 382°C	Aircraft - Nacelle Structures
APC PEKK FC	High toughness and excellent chemical resistance with very low flammability and smoke toxicity	Thermo- plastic Prepregs	Inter- mediate modulus	12" carbon fiber tape	145 (34% resin content)	159	15-30 min at 377°C	Aircraft - Engine and Nacelle Structures; Launch Vehicles Sturctures; E-Motors - Rotor Sleeve, Wings, Fuselage, Pylons, Empennage





# Primer

### **Corrosion inhibiting bonding primers**

Designed to improve the adhesion of materials to a substrate.

Providing maximum environmental resistance and bond line durability

Product name	Details	VOC [g/l]	Service temp. [°C]	Solids	Shelf life	Compatible surface pretreatment	Outtime @ RT [days]	Cure temp.[°C]	Aerospace
BR127	Chromated, industry standard, solvent-based, yellow	YES ~792	150	10%	12 M @ -18 °C	PAA, PSA, CAA	10	80- 120	
BR6747-1	Chromated, qualified, water based, yellow	NO	180	20% or 30%	12 M @ 4 °C	PAA, PSA	60	120- 180	<b>✓</b>
BR127NC	Non-chromated, solvent-based, yellow	YES ~792	150	10% or 12%	12 M @ -18 °C	CAA	10	80- 120	✓
BR 179	Non-chromated, solvent-based, yellow	YES ~792	180	10%	12 M @ -18 °C	PAA, PSA, Sol-Gel	60	120- 180	
BR6747-1 NC	Non-chromated, Zero VOC, water based, yellow	NO	180	20%	12 M @ 4 °C	PAA, PSA, Sol-Gel	60	120- 180	✓
BR252	Film forming, non-chromated	Low VOC	150	18%	12 M @ 4 °C	PAA, PSA	60	120- 180	

#### Heat and fire protection for nacelle, pylon and strut applications

Our DAPCO<sup>TM</sup> firewall sealants provide exceptional heat and fire protection for nacelle, pylon, and strut applications, making them ideal for aviation and aerospace industries. Our epoxy products are commonly used for honeycomb core stiffening, edge filling, and insert potting.

DAPCO™ offers rapid-cure and room temperature-cure formulations that increase manufacturing throughout and allow use in field repair applications. Our products are formulated to adhere to a variety of substrates, enabling the use of one product across multiple applications.

Category	Product	Chemical category	Service temperature [°C]	Curing temperature [°C]	Benefits	Formulation
	Dapco 2100	Silicone	-54 to 204	> 13	Fire resistance to 1927°C Qualified to BMS 5-63, AMS3374, BAMS 552-004 and CMNP009	one-component
Silicone sealants	Dapco 2200	<b>Papco 2200</b> Silicone -54		> 13	Quick cure and fire resistance to 1093°C Qualified to AMS3374 and BMS 5-63	two-component
ilicor	Dapco 72	Silicone		22 - 65	Cures rapidly in ambient conditions	two-component
o,	Dapco 18-4F	Silicone		13 - 66	Fire resistance to 1093°C Environmentally friendly formulation Qualified to BMS 5-63	two-component
	Dapco 3300	Silicone	-54 to 93	21	Qualified to aircraft manufacturer specifications	two-component

# High-performance epoxy potting compound for lightweight, durable honeycomb structures

BR® 623P4 is a high-performance, one-part epoxy potting compound tailored for insert and edge filling of honeycomb structures. With low viscosity, it's ideal for filling small honeycomb cells and deep sections, supporting both manual application and automated dispensing. Its cured low density (0.60–0.78 g/cm³) and robust mechanical properties make it suitable for lightweight, high-strength applications in aerospace and other advanced composite industries. The thixotropic nature of BR® 623P4 ensures no slumping during curing, providing precise edge filling and structural integrity. It withstands temperatures from -55°C to 110°C and is co-curable with advanced composites, maintaining performance under extreme conditions. The compound is self-extinguishing, meets stringent smoke density standards, and resists various aerospace fluids, enhancing safety and durability in demanding environments.

Category	Product	Chemical category	Service temperature [°C]	Curing temperature [°C]	Benefits	Formulation
Epoxy potting compound	BR 623 P4	Ероху	-55 to 110	120 to 180	Resistant to aerospace fluids and solvents	one-component





# Adhesives

A range of structural film and foam adhesives for demanding environments.

Product	Carrier	Characteristics	Color	Nominal weight [gsm]	Nominal thickness [mm]	Recommended primer	Lap shear strength [24°C] / Mpa [gsm]
	300: Tight Knit	Enhanced bond line thickness control	Blue	391 488	0,33	BR® 127	35,5 (391)
	300K: Wide Open Knit	Highest performance overall	Green	<ul><li>244</li><li>391</li></ul>	0,20 0,33	BR® 127	36,8 (244) 40,3 (391)
FM® 300-Series	300M: Random Mat	Best bond line and flow control. Reduced tendency to trap air during lay-up	Green	146 391	0,13 0,33	BR® 127	29,8 (146) 36,4 (391)
	300U: Unsupported	Can be reticulated	Green	146 269	0,13 0,20	BR® 127	-
	300-2K: Knit	Excellent moisture and corrosion resistance	Red	489 391	0,41 0,33	BR® 127	37,3 (489) 40,7 (391)
FM® 300-2-Series	300-2M: Random Mat		Red	<ul><li>244</li><li>293</li><li>146</li></ul>	0,20 0,25 0,13	BR® 127	33,5 (244)
	300-2U: Unsupported		Red	146	0,13	BR® 127	-
FM® 309-1-Series	309-1K: Knit	Excellent fracture toughness. Good tack and handling properties. Good combination of high peel and shear properties.	Light Red	<ul><li>146</li><li>244</li><li>293</li><li>391</li></ul>	0,127 0,203 0,254 0,330	BR® 6750	35 (391)
	309-1M: Mat 309-1U:						30,5 (244)
	Unsupported			293		BR® 6750	41,2 (244)
FM® 57-Series	Fiberglass	Does not contain MDA	Brown	488		BR® 57	24,8 (490)
	73: Polyester knit, both sides tacky	Outstanding durability in bonding metals	Yellow	<ul><li>210</li><li>300</li><li>420</li></ul>	0,18 0,25 0,38	BR® 127	44,9 (300) 47,2 (425)
FM® 73-Series	73M: Polyester mat, both sides tacky	Superior handling characteristics	Dark Green Yellow	150 210 300 420	0,13 0,18 0,25 0,38	BR <sup>®</sup> 127	39,8 (150) 46,1 (300)
	73M OST: Polyester mat, one side tacky	Possibility to accommodate large part fabrication	Dark Green Yellow	150 300 420	0,13 0,25 0,38	BR® 127	42,8 (150) 45,4 (300)
	73U: Unsupported		Green Yellow	100 150	0,09 0,13	BR® 127	-
	94K: Polyester Knit	High temperature performance Provides electrical insulation	Green	<ul><li>146</li><li>220</li><li>293</li><li>391</li></ul>	0,15 0,18 0,25 0,30	BR® 6747-1	46,6 (293)
FM® 94-Series	94M: Polyester Mat		Green	146 293	0,13 0,25	BR® 6747- <sup>1</sup>	43,7 (293)
FIM® 94-Series	94M OST: Polyester Mat, One-side tacky	Helps reducing air entrapment	Green	293	0,25	BR® 6747-1	-
	94U: Unsupported		Green	146	0,13	BR® 6747-1	-

Product	Carrier	Characteristics	Color	Nominal weight [gsm]	Nominal thickness [mm]	Recommended primer	Lap shear strength [24°C] / Mpa [gsm]
	377U: None		Grey	269	0,13	BR® 6747-1	-
FM® 377-Series	377S: Knit		Grey	293 391 464	0,15 0,25 0,33	BR® 6747-1	21,5 (293)
	450-1U: None	Excellent resistance to both pre-bond and post-bond humidity	Yellow	146	0,13		8,8 (293)
FM® 450-1-Series	450-1M: Mat	Good tack and handling properties	Yellow	146 293	0,13 0,15		23,3 (244) 22,0 (400)
	450-1G: Mat	Excellent fracture toughness	Yellow	293	0,15		-
FM® 410-1-Series	Unsupported	No metallic powders or asbestos Good radar transparancy	Blue turning to green during cure	635 1.269 2.539	0,64 1,27 2,54	-	7,6*
FM® 490A-Series	Unsupported	Non-asbestos, no metallic fillers Radar transparent	Tan	732 1.416 2.832	0,64 1,27 2,54	-	9,6*

# Adhesive films compatible with MTM, VTM or HTM-prepreg series

Product	Carrier	Characteristics	Color	Nominal weight [gsm]	Nominal thickness [mm]	Recommended primer	Lap shear strength [24°C] / Mpa [gsm]
HTA® 240	Polyester Mat	Formulated for co-curing with many HTM® structural prepregs	Purple	188 313	-	BR® 127	32 (313)
MTA® 240	Unsupported Polyester Mat	Formulated for co-curing with many MTM® structural prepregs	Blue	150 313	-	BR® 127	40 (150) 24 (313)
VTA® 260	Unsupported Polyester Mat Polyester Mat Polyester Mat	Formulated for co-curing with many VTM® structural prepregs	Pink	150 263 313 413	-	BR® 127	23,0 (313)

<sup>\*</sup> Tube Shear Strength

### **NEW Crestomer® SCOTT BADER**



Urethane Acrylate Structural Adhesives

Product name	Description	Approvals	Appearance	Working time [min]	***Fixture time [h]	Tensile strenghth [MPa]	Tensile modulus [MPa]	Tensile elongation [%]	Specific gravity [g/mL]
1150PA	High performance structural adhesive with shorter fixture time	Lloyds, Class NK	Mauve Gel	*50	5	22 - 25	1000 - 1500	100 - 120	1,05
1151A	Adhesive for bulk application; Amine accelerated	Lloyds, DNV.GL, Class NK	Gree / Yellow Gel	**25	2,5	22 - 25	1000 - 1500	100 - 120	1,05
1152PA	High performance structural adhesive	Lloyds, RINA, DNV.GL, Class NK	Mauve Gel	*50	8,5	22 - 25	1000 - 1500	100 - 120	1,05
1153PA	High performance structural adhesive with long open time	Lloyds, RINA, Class NK	Mauve Gel	*90	8,5	22 - 25	1000 - 1500	100 - 120	1,05
1186PA	Multi-purpose structural adhesive	Lloyds	Grey Paste	*50	5,5	13 - 16	700 - 900	4 - 7	1,3
1196PA	Low density structural- core bonding adhesive	Lloyds, DNV.GL	Pink Paste	*50	6,5	19 - 22	1000 - 1500	4 - 7	0,6
Advantage 10	Hight performance structural adhesive for bonding a wide range	Lloyds	White Paste	10	1,2	22 - 25	400 - 600	100 - 120	1,15
Advantage 30	of substrates. Minimal surface preparation required. Pre-packed in	Llyods, RINA, DNV.GL	White Paste	30	2,5	22 - 25	400 - 600	100 - 120	1,15
Advantage 60		Lloyds	White Paste	60	3	22 - 25	400 - 600	100 - 120	1,15
Crestomer® Bio 1140PA	Excellent adhesion to FRP material, surface must be free of dust and grease		Mauve Gel	85	4	27 - 30	1500 - 1900	> 40	1,05

<sup>\*</sup> Medium reactivity MEKP catalyst

\*\* Medium reactivity dibenzoyl peroxide paste catalyst

\*\*\* Time taken at 23 °C to achieve 1,4 MPA strengthin lap-shire tests according to BS ISO 4587

#### **Crestafix**®



Polyester, vinyl ester and hybrid bonding paste designed for GRP, laminate and plasterboards, ideal for all non-structural applications.

Category	Product name	Description	Working time [min]	Tensile elongation [%]	Lap shear [MPa]	Specific gravity [m/ml]
	B39	Pumpable polyester-based bonding paste with gap filling properties	55	1	4	1,05
General	90-82PA	General purpose orthophthalic bonding paste	12	2	5	1,35
purpose	90-82PA HP	General purpose orthophthalic bonding paste, thixotropic properties upon vertical application	23	2	5	1,35
High performance	621CC	Urehtane acrylate/ isophthalic polyester bonding paste	25-50	3	10	1,25
	630PA	Vinyl ester bonding paste	40	3	10	1,10
Fast cure	90-78PA	Fast cure orthophthalic bonding paste	8	1	5	1,30
Light weight	90-84PA	Lightweight orthophthalic bonding paste with low exotherm	30	6	4	0,60
Fiber filled	90-80PA	Polyester-based paste with short fibers	12	2	4	1,25
Core-bond	B72R	Lightweight, polyester-based core adhesive, catalyzed with MEKP	55	2	5	0,70
Fairing compopund	F26R	Fast setting polyester-based fairing compound with good sanding properties	3	1	2	0,70



### Consumables



Our comprehensive range of composite consumables, including vacuum films, release films, and adhesive tapes, provides customized solutions for every stage of the resin infusion process. Complemented by high-quality products such as peel ply, sealing tapes for vacuum films, and ventilation-extraction systems, we support efficient and high-quality manufacturing processes in the rubber and silicone product industries and other demanding applications.

Consumables	Desciption	Max. working temperature [°C]
Vacuum films	Vacuum films are used in the production of fiber-reinforced composites with vacuum technologies, particularly the vacuum infusion process. They are suitable for the production of both simple and complex shapes and offer significant advantages in processing. Their excellent mechanical and chemical resistance allows for use in demanding production processes, such as those required for phenolic resins.  The various available stretch rates and temperature resistances enable the use of non-porous vacuum films to be tailored to specific materials and applications. With stretch capabilities of up to 500%, it is possible to adapt the film to complex contours. Multi-layer vacuum films enhance safety in high-temperature applications.	121-446
Separation films	Release films are used in vacuum technology with vent valves and in the vacuum infusion process as a more cost-effective alternative to peel ply, provided that the adhesion of the mold surface plays a minor role. The release films are offered with and without perforation. Depending on the material used in their production, they are suitable for various types of resins. They separate the laminate from the breather fabric and help to remove excess resin from the laminate.	93-405
Adhesive tapes	Adhesive tapes, available in rubber, silicone, or acrylic, guarantee high temperature resistance and flexibility in your application during the infusion process.	177-399
Mold release agent (non-liquid)	Mold release agents can be used to ensure a contamination-free separation from the component. Time savings are enabled by excellent cleaning behavior after removal. The release agents exhibit high elongation, good tear resistance, and high temperature resistance, making them easier to apply over complex mold surfaces.	190-260
Peel ply	Peel ply are auxiliary materials used in vacuum infusion technology to achieve a product with a smooth inner surface. After the resin has cured, the peel ply is removed to retain the matte fine structure of the fabric. The use of peel ply eliminates the need for surface treatment such as sanding and degreasing before bonding. Peel ply made from fiberglass also allows for very high operating temperatures of up to 427°C.	121-427
Sealing tapes for vaccum films	Vacuum sealant tapes serve two functions in vacuum technology: they act as an adhesive between the mold and the vacuum film and as a sealant between the layers. Depending on the application process and temperature, sealant tapes are available in various designs. They have different levels of tackiness, ensuring good adhesion between two bags at both cold and higher temperatures, while also being very easy to remove.	121-427
Ventilation- extraction	Suction nonwovens are used in the production of laminates in vacuum technology. The suction nonwoven is placed between the perforated release film and the vacuum film. The nonwoven is designed to drain excess resin from the laminate, thereby aiding the ventilation of the laminate. Available in various different basis weights and also suitable for use at very high temperatures.	190-427

Consumables	Desciption	Max. working temperature [°C]
Vacuum valves and hoses	Connectors and valves are used as accessories in vacuum infusion technology because they are needed for ventilating the laminates. In addition to vacuum regulators and manometers for adjusting the required pressure, vacuum hoses can also be used, which are specially designed for use in autoclaves or at very high temperatures. Furthermore, self-piercing valves, for example, make the work in the vacuum process easier as they can be quickly deployed and do not require prior processing of the vacuum film.	135-538
Rubber and silicone products	The various rubber and silicone products offer the possibility of manufacturing flexible molded parts, pressure intensification pieces, and vacuum bags with high performance. Additionally, products made from translucent materials allow the visibility of process sequences under the vacuum bag, thereby enabling the correction of errors.	100-260
Products for resin infusion	We offer a wide variety of products specifically for resin infusion. Combination products made from a resin distribution medium and a release film result in significant labor time savings and enable good resin flow. Vacuum channels simplify the infusion process and support an even distribution of resin.	-



Precision in action: A lab technician carefully cuts a vacuum bag. At the Biesterfeld Lab and Innovation Center, we provide expert services to help customers select the ideal consumables for their specific project.

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Competence in Solutions

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