

EPOXY

CARBON RTM
FIBER COMPOSITES VACUUM MATERIALS
SMC **VACUUM INFUSIONS**
ADHESIVES **GLASS**

PREPREGS





We welcome you!

HACOTECH GmbH was founded to optimally bundle synergies in the sector of fibre composite technology and to offer their customers business solutions from a single source.

Many years of experience have shown that hardly any other industry demands such high standards as in the construction and production of components from fibre composite technology.

The requirements for the production of optimized components are assembly oriented construction and demand dependant dimensioning. Therefore, not only raw materials have to be chosen from an extensive range, but also their optimal combination has to be determined to fulfill the highest standards required. With that, comes the selection of appropriate

production techniques, combined with determining suitable production means and, if required, briefing and training of staff.

Our aim is to support you in achieving your goal with our professional and comprehensive know-how. For us, cost-efficiency, quality and reliability are our top priorities. Equally, we endeavor to adapt our range of services to the customer's individual requirements and thus further develop our services.

Jürgen Tramnitz
Managing Director



We are waiting for your request!

HACOTECH GmbH
 Helmut-Nack-Straße 6d
 21035 Hamburg
 Germany

Telefon: +49(0)40/797 557-190
 Fax: +49(0)40/797 557-199
 E-Mail: info@hacotech.com
 Website: www.hacotech.com

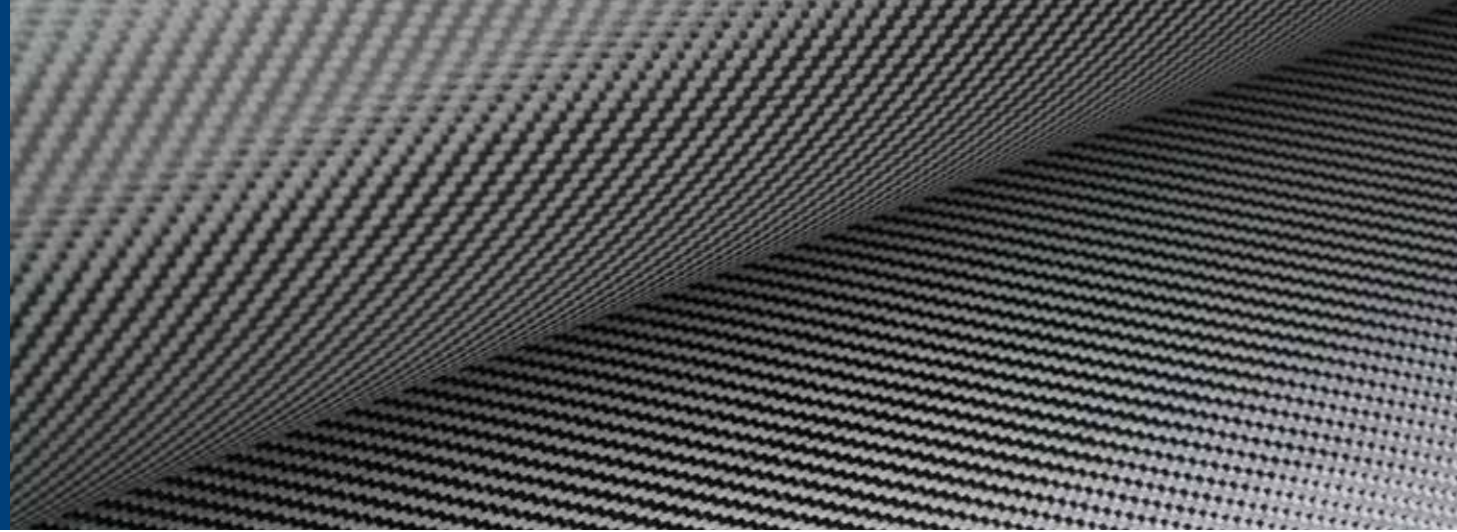


Our strong partners:



Table of contents

Carbon Woven	page 6	Infusion meshes	page 24
Multiaxial carbon fabrics	page 7	Flow lines, Equipment	page 25
Hybrid fabrics, Carbon non-wovens, Carbon tapes	page 8	Hoses, Clamps, Connectors	page 26
Prepregs, Forged carbon	page 9	Connectors, Couplings, Manometer, Leak detectors, Gauge	page 27
Glass Woven		Peel ply	page 28
Glass tapes/-tubes	page 10	Breather/Bleeder	page 29
Multiaxial glass fabrics	page 11	Sealant tape, Fixation	page 30
Glass rovings, Woven rovings	page 12	Adhesive tapes	page 31
Parabeam®	page 13	HACOPEEL multifunctional fleece	page 32
Chopped strand mat, Continuous strand mat	page 14	Filler	page 33
Stitched and needled glass combi mats	page 15	Hot Bonder	page 34
RTM Core Materials	page 16	Heater	page 35
Nomex honeycombs, PVC-foam Airex®	page 17	Customized sizing/cutting	page 36
Epoxy resin systems	page 18/19	Service	page 37
HACOPOL epoxy resin system, Prepreg resin system	page 20	Trainings	page 38/39
Polyester- gelcoats, adhesives	page 21	Tools, equipment, facilities	page 40
Vacuum foils	page 22	Toolkits, Job safety	page 41
Vacuum hoses , Release and perforated films	page 23		



Carbon Woven

Stability and rigidity qualify carbon fibre reinforced plastics (CRFP) for all areas in which high mechanical energies occur, yet the weight is supposed to stay low. Our carbon fibre webbings stand out due to their consistent high quality. Our in stock grammages of 160 g/m² up to 420 g/m² guarantee quick availability.

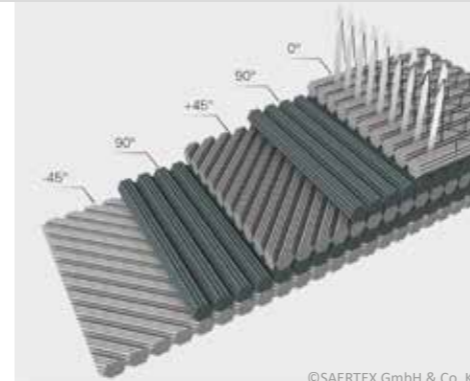


art.No.	weight g/m ²	weave / specification	width mm	roll length lm
C090P-1000	93	Plain, 1K	1000	100
C160P-1000	160	Plain, 3K	1000	100
C160T-1000	160	Twill 2/2, 3K	1000	100
C200P-1000	200	Plain, 3K	1000	100
C200T-1000	200	Twill 2/2, 3K	1000	100
C200T-1200			1200	100
C245T-1000	245	Twill 2/2, 3K	1000	100
C245T-1200			1200	100
C280T-1000	280	Twill 2/2, 3K	1000	100
C300P-UTFX-0500	300	Plain / unidirectionally thermofixed, 12K	500	100
C300P-UTFX-1000			1000	100
C400P-1250	400	Plain, 12K	1250	100
C420T-1000	420	Twill 2/2, 12K	1000	100
C600P-UTFX-1000	600	Plain / unidirectionally thermofixed, 24K	1000	100
C600T-1000			1000	100
CAR24		Carbon fibre roving coil , 24K		6 kg/coil

Multiaxial carbon fabrics

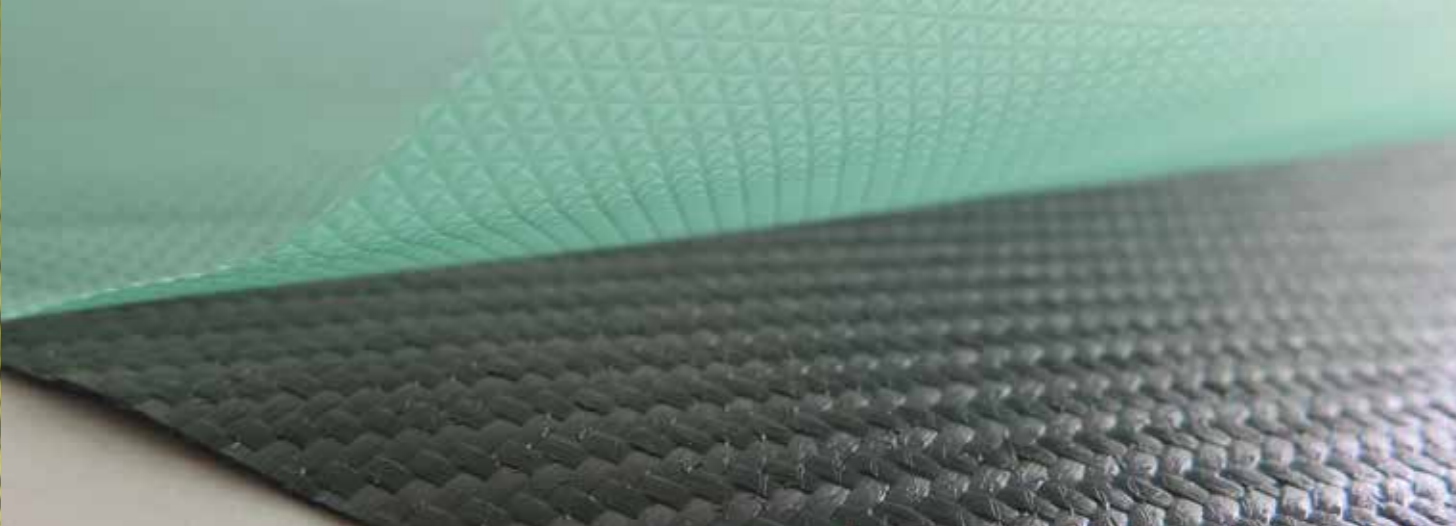
art.No.	weight g/m ²	specification	construction	width mm	roll length lm
Unidirectional					
C050U-1270	50	Unidirectional carbon fabric	0°	1270	50 (3 kg)
C100U-1270	100	Unidirectional carbon fabric	0°	1270	50 (7 kg)
C200U-1270	200	Unidirectional carbon fabric	0°	1270	50 (10 kg)
C300U-1220	300	Unidirectional carbon fabric	0°	1220	100 (37 kg)
C500U-1220	500	Unidirectional carbon fabric	0°	1220	50 (32 kg)
Biaxial					
C100BX-1270	100	Biaxial carbon fabric	+/- 45°	1270	50 (7 kg)
C200BX-1270	200	Biaxial carbon fabric	+/- 45°	1270	50 (13 kg)
C300BX-1270	300	Biaxial carbon fabric	+/- 45°	1270	50 (19 kg)
C401BX-1270	400	Biaxial carbon fabric	+/- 45°	1270	50 (26 kg)
C600BX-1270	600	Biaxial carbon fabric	+/- 45°	1270	50 (39 kg)
Quadraxial					
C800QX-1270	800	Quadraxial carbon fabric	0°/-45°/+45°/90°	1270	50 (52 kg)
Bidirectional					
C400BD-1270	400	Bidirectional carbon fabric	0°/90°	1270	50 (26 kg)

In comparison to the fabrics the single rovings are sewn together in a multiaxial fabric. Without the deflection, which inevitably occurs during weaving and is a weakness of the fabric, the whole performance of the carbon fibres can take effect. Unidirectional multiaxial fabric ensure an ideal dissipation of the impact energy, if the direction of force is known. For a fast processing we recommend multiaxial fabrics with several fibre alignments (Biaxial-, Triaxial- and Quadraxial multiaxial fabrics).



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Aramid-/hybrid fabrics

Aramid fabric is used wherever impact strength and ballistic properties are needed. In mixed webbing with carbon fibre the outstanding properties stability and impact strength of both fibre types come together.

art.No.	weight g/m ²	weave / specification	width mm	roll length lm
A170T-1000	170	Twill 2/2 / Aramid fabric	1000	100
A220T-1000	220	Twill 2/2 / Aramid fabric	1000	100
CA165P-1000	165	Plain / Carbon-/Aramid fabric	1000	100

Carbon non-wovens

The nonwovens are made of recycled carbon fibers and are sewn or needled. They are used in infusion processes for mold making in order to achieve good surfaces without additional gelcoat. Due to the isotropic structure of the fibers, the nonwovens have good mechanical properties in the further processing of the finished component (for example milling).

art.No.	weight g/m ²	weave / specification	width mm	roll length lm
C100VN-1500	97	needled non-woven, sorted, 1,0 mm thick	1500	100
C300V-1500	300	stitched non-woven, sorted, 2,8 mm dick	1500	100
C300VN-1500	300	needled non-woven, sorted	1500	100
CM300V-1500	323	stitched non-woven, mixed non-woven (max. 12% glass fiber & polyester parts)	1500	100

Carbon fabric tapes

A common application field for fabric tapes are pipes and poles. Fabric tapes also provide an improved flux between laminates in form of laminated reinforcements over adhesive connections.

art.No.	weight g/m ²	weave / specification	width mm	roll length lm
C160P	160	Plain	25-100	100
C220P	220	Plain	25-100	100
C250U	250	Unidirectional carbon fabric tape	25-100	100
C350U	350	Unidirectional carbon fabric tape (6K oder 12K)	25-100	100

Prepregs

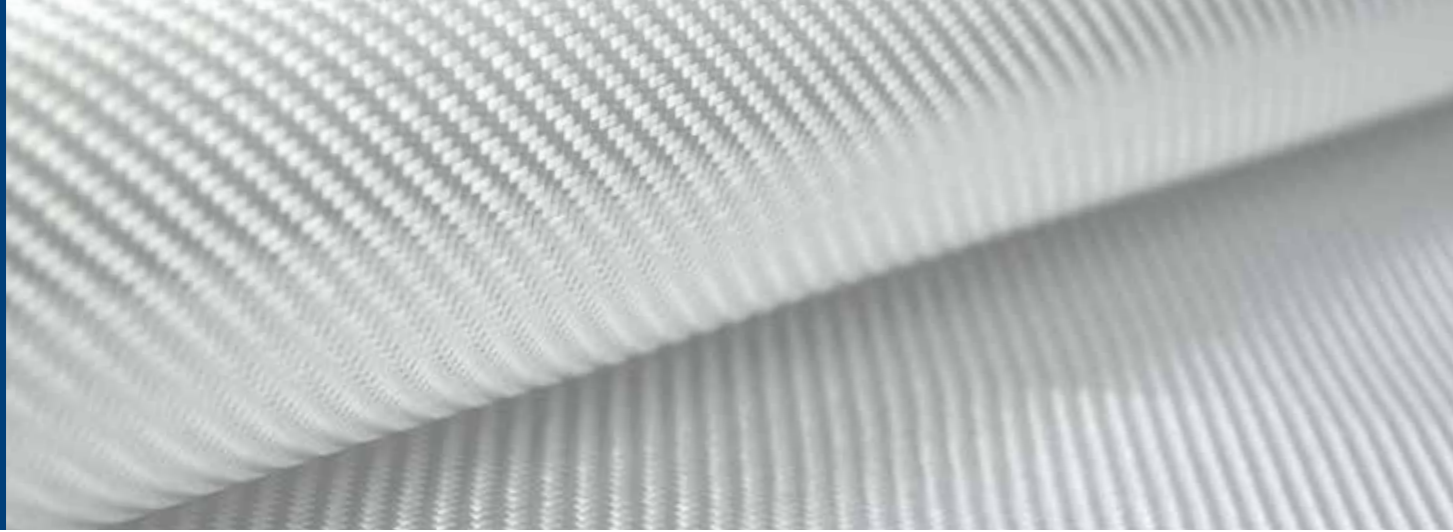
The prepregs are manufactured in combination with our standard fabric types according to the customers' request. Should you not find the required material for your purpose, don't hesitate to contact us. We'll develop a tailor made solution for you!

art.No.	name	curing time/°C (time/°C) max. TG (max. TG)	application	width mm	roll length lm
Low temperature prepreg					
LTC-G1400	Low temperature prepreg	1h@92°C 2h@120°C 1h@147°C 1h@177°C 2h@196°C	195°C light weight carbon fiber epoxy device prepreg, for curing at low temperatures, Basis weight 193g/m2, LTC-G1600: Basis weight 644g/m2, 125 width	1250	23
Medium temperature prepreg					
HACOPREG MTP 126S	Middle temperature prepreg	12h@80°C 1h@120°C 15min.@140°C	125-130°C Especially for viewable components, high transparent, strength for application in the field of automotive, nautical and sporting industries	1000	50
High temperature prepreg					
HACOPREG HTP 160	High temperature prepreg	12h@80°C 60min.@120°C 60min.@150°C	160-165°C Good mechanical properties, high temperature resistance, automotive, marine, sports articles	1000	50

Forged Carbon

art.No.	name	curing time/°C (time/°C) max. TG (max. TG)	application	width mm
CMC070B	Middle temperature carbon Moulding compound	8h@80°C (TG 105°C) to 15min@140°C (TG 125°C)	130°C High tensile strength, carbon fiber length 6 mm. Processing from 70°C in autoclave or pressing processes, automotive, marine, sports articles	
CMC080- 25/50	Middle temperature carbon Moulding compound	8h@80°C 1h@120°C 15min@140°C	105-130°C High tensile strength, carbon fiber length 25 or 50 mm. Processing from 80°C in autoclave or pressing processes, automotive, marine, sports articles	480





Glass Woven LBA admission

Glass fibre fabrics are the standard product in a lot of fibre reinforced plastics. Low price, high stability and resistiveness against chemicals and other environmental impacts qualify them as a universal material. Low grammages are used as surface layers, heavy woven roving is used for instance for the fast and economic mould construction. The premium finish of the fabrics enables a good fibre-matrix-bond and results in durable, resistant components.



art.No.	weight g/m ²	weave / specification	width mm	roll length lm
G025P-1270	25	Plain, Finish FK 144	1270	100
G050P-1120	50	Plain, Finish FK 144	1120	100
G070P-1270	70	Plain, Finish FK 144	1270	100
G080P-1000	80	Plain, Finish FK 144	1000	100
G160P-1000	163	Plain, Finish FK 144	1000	100
G160T-1000	163	Twill 2/2, Finish FK 144	1000	100
G160T-1000 schwarz	163	Twill 2/2 black pigmented, Finish FK 144	1000	100
G201P-1270	200	Plain, Finish FK 144	1270	100
G200T-1270	200	Twill 2/2, Finish FK 144	1270	100
G290T-1000	290	Twill 2/2, Finish FK 144	1000	100
G290T-1000 schwarz	290	Twill 2/2 black pigmented, Finish FK 144	1000	100
G390P-1000	390	Plain, Finish FK 144	1000	100
G390T-1000	390	Twill 2/2, Finish FK 144	1000	100
G1000S-1000	1000	special weave	1000	100

All glass fabrics are also available with silane sizing.



Glass fabric tapes/-tubes

art.No.	weight g/m ²	weave / specification	width mm	roll length lm
GT140P	140	Glass fabric tape, Plain	25, 50, 100	100
GT225P	225	Glass fabric tape, Plain	25, 30, 50, 80, 100	100
GT320P	320	Glass fabric tape, Plain	50, 100	100
GFT045	27	Glas fabric sleeving	∅ 45	100
GFT021	27,7	Glas fabric sleeving	∅ 20	100

Multiaxial glass fabrics

art.No.	weight g/m ²	specification	construction	width mm	roll length lm
Unidirectional					
G300U-1270	300	Unidirectional glass fabric	0°	1270	50 (19 kg)
G600U-1200	600	Unidirectional glass fabric	0°	1200	70 (50 kg)
G950U-1300	950	Unidirectional glass fabric	0°	1300	40 (50 kg)
G1210U-1300	1210	Unidirectional glass fabric	0°	1300	32 (50 kg)
Bidirectional					
G410BD-1300	410	Bidirectional glass fabric	0° / 90°	1300	100 (54 kg)
G600BD-1300	600	Bidirectional glass fabric	0° / 90°	1300	60 (49 kg)
Biaxial					
G300BX-1270	300	Biaxial glass fabric	+/- 45°	1270	50 (19 kg)
G430BX-1270	430	Biaxial glass fabric	+/- 45°	1270	91 (50 kg)
G600BX-1270	600	Biaxial glass fabric	+/- 45°	1270	65 (50 kg)
G800BX-1270	800	Biaxial glass fabric	+/- 45°	1270	51 (50 kg)
Triaxial					
G600TX-1270	600	Triaxial glass fabric	0°/-45°/+45°	1270	52 (40 kg)
G830TX-1270	830	Triaxial glass fabric	0°/-45°/+45°	1270	47 (50 kg)
G910TX-1270	910	Triaxial glass fabric	0°/-45°/+45°	1270	40 (47 kg)
Quadraxial					
G620QX-1270	600	Quadraxial glass fabric	0°/-45°/+45°/90°	1270	52 (41 kg)
G820QX-1270	820	Quadraxial glass fabric	0°/-45°/+45°/90°	1270	48 (51 kg)
G970QX-1270	970	Quadraxial glass fabric	0°/-45°/+45°/90°	1270	40 (50 kg)
G1230QX-1270	1230	Quadraxial glass fabric	0°/-45°/+45°/90°	1270	30 (47 kg)

When manufacturing multiaxial glass fabrics the single glass fibre rovings are sewn together layerwise and form a slide proof but yet drapable raw material for the production of high performance glass fibre laminates. We have Unidirectional, Biaxial and Quadraxial multiaxial glass fabrics in standard grammages in stock at all times.





Glass rovings

High quality E-glass roving, compatible with unsaturated polyester resins, vinyl ester resins and epoxy resins. The direct roving is produced in one working cycle. With a special sizing and bunched together into a uniformly strained strand, the direct roving can be used mainly for weaving, winding and pultruding. The direct roving is particularly characterized by low-lint processing and excellent impregnation properties.

art.No.	Tex	specification	coil weight
GR TM-2400 tex	2400	Direct roving, endless fiber strand, filament diameter 16 µm	20 kg
GR 4800tex	4800	Direct roving, endless fiber strand, filament diameter 24 µm	20 kg
GR 2400 spray up	2400	Direct roving, Creel Pack, filament diameter 12 µm	16 kg



Woven roving

art.No.	weight g/m ²	weave / specification	width mm	roll length lm
WR300P-1250	300	Plain	1250	100
WR380T-0800	380	Twill 2/2	800	100
WR500P-1250	500	Plain	1250	80
WR580P -1200	580	Plain	1200	110
WR800P -1250	800	Plain	1250	50

Glass fibre fabrics are the standard product in a lot of fibre reinforced plastics. Low price, high stability and resistiveness against chemicals and other environmental impacts qualify them as a universal material. Hte heavy woven roving is used for instance for the fast and economic mould construction. Any other weight or weave can be offered on customer request.



Parabeam®

Parabeam® 3D glass fabric is a three-dimensional fabric for the easy and fast production of sandwich constructions. Its excellent mechanical properties and user-friendliness make it a perfect material for the composite industry. Sandwich parts can be produced in a single step. Parabeam® 3D glass fabric is available in a thickness of 3-22mm and can be used with polyester, vinylester, epoxy and phenolic resins.

Our 3D fiberglass fabric is a fiberglass structure consisting of the bi-directional fabric woven together by vertical columns. After impregnation, Parabeam® 3D glass fabrics have a superior property both mechanically and chemically. In combination with resin, it is particularly suitable for a core material in industries that are heavily dependent on factors such as weight, impact strength, thermal insulation, acoustic damping and high strength.

art.No.	weight g/m ²	thickness mm	width mm	roll length lm
ParaGlass/3	780	3,0	1270	39,7
ParaGlass/5	840	5,0	1270	39,7
ParaGlass/8	930	8,0	1270	39,7
ParaGlass/10	1010	10,0	1270	39,7
ParaGlass/12	1054	12,0	1270	39,7
ParaTank/3	755	3,0	1270	47,25
ParaTank/4,5	845	4,5	1270	47,25
ParaTank/6	905	6,0	1270	47,25
ParaTape	630	0,5	100	50,00





Chopped strand mat

Glass mats are non-woven reinforcing fibers for the production of fiber composite materials and consist of cut and non-oriented E-glass spun yarns with a length of approx. 50 mm. Product characteristics: Uniform thickness and fiber distribution, very good resin impregnation and moldability, good mechanical properties, easy cutting.

art.No.	weight g/m ²	specification	width mm	roll weight kg
CSM225P-1250	225	Powder	1250	42
CSM300P-1250	300	Powder	1250	42
CSM300E-1250	300	Emulsion	1250	42
CSM450P-1250	450	Powder	1250	42
CSM450E-1250	450	Emulsion	1250	42
CSM600P-1250	600	Powder	1250	42
CSM600E-1250	600	Emulsion	1250	42

Continuous strand mat

Nonwoven mat made of endless glass fibers which are randomly oriented in several layers. Particularly suitable for press-formed electrical and non-electrical laminates as well as for pultrusion, infusion or injection processes (eg RTM, S-RIM or matched Die molding). The products contain an insoluble binder for unsaturated polyester, epoxy and polyurethane compatibility in unfilled or filled resin systems.

art.No.	specification	weight g/m ²	width mm
CM4020	For press forms and infusions	300/450/600	1300 - 2600
M8610	For press forms and infusions	300/450/600/750	1300 - 2600
M8615	For press forms and infusions	225/300/450/600	1300 - 2600
M8630	For press forms	300/450/600	1300 - 1700
M8643	For pultruded components	300/450/600	1270 - 1700



Stitched glass combimats

Glass combimats are sandwich constructions made from roving fabrics and non-oriented glass spun threads. They reduce the fabrication and drinking wall and are suitable for larger and thick laminates. Glass combimats can easily be cut and do not disintegrate into the individual fibers.

art.No.	weight fabric g/m ²	weight mat g/m ²	specification	width mm	roll length lm
CM 300/300	300	300	E / ECR	1250	70
CM 500/300	500	300	E / ECR	1250	55
CM 500/450	500	450	E / ECR	1250	45
CM 600/300	600	300	E / ECR	1250	50
CM 600/450	600	450	E / ECR	1250	40
CM 800/450	800	450	E / ECR	1250	35

Needled glass combimats

Needled combimats are volumized glass sandwich constructions, which are connected by needling without chemical bonding. These combimats are mainly used for mold making and pultrusion. Very good drapability, lamination of corners and edges, can be cut well.

art.No.	weight fabric g/m ²	weight mat g/m ²	specification	width mm	roll length lm
CMN 240/200	240	200	For pultruded components	1250	150
CMN 300/300	300	300	For pultruded components	1250	150

Use our cutting service:
We would like to cut our glass fiber textiles according to your requirements.

More information can be found here in the catalog on page 37.



RTM Core Material

Stitched sandwich complex, consisting of a basic version of one or two layers of Chopped Strand Mat (CSM) and the core material PP (resin flow zone). The resin flows through the core material and, by means of vertical injection from the outside, the resin subsequently impregnates the outer reinforcements. The flow aid inside accelerates the resin flow and distributes the resin evenly. This saves time and also facilitates work on larger components.

art.No.	specification	weight g/m ²	width mm	roll length lm
SCU300 PP18 300	CSM 300 / PP 180 / CSM 300	780	1250	50 (49 kg)
SCU300 PP25 300	CSM 300 / PP 250 / CSM 300	850	1250	50 (54 kg)
SCUHF 300 PP25 300	CSM 300 / PP 250 / CSM 300 ultra high flow	850	1250	40 (43 kg)
SCU450 PP18 450	CSM 450 / PP 180 / CSM 450	1080	1250	40 (54 kg)
SCU450 PP25 450	CSM 450 / PP 250 / CSM 450	1150	1250	40 (58 kg)
SCUHF 450 PP25 450	CSM 450 / PP 250 / CSM 450 ultra high flow	1150	1250	40 (58 kg)
SCU600 PP18 600	CSM 600 / PP 180 / CSM 600	1380	1250	30 (52 kg)
SCU600 PP25 600	CSM 600 / PP 250 / CSM 600	1450	1250	30 (55 kg)
SCUHF 600 PP25 600	CSM 600 / PP 250 / CSM 600 ultra high flow	1450	1250	30 (55 kg)



Further weights, weaves and constructions available on request. Please contact us!



Nomex honeycombs

Nomex honeycombs consist of aramid fibres, that are soaked in phenol resins. In combination with prepregs efficient, lightweight sandwich components are formed. Another processing possibility is vacuum bagging.

art.No.	specification	dimensions mm
4.8-48-NXI	Nomex honeycombs, 4,8 mm cell size, 48 kg/m ³ , industrial quality	2550 x 1220
4.8OX-48-NXI	Nomex honeycombs, 4,8 mm cell size, overexpanded, 48 kg/m ³ , industrial quality	2550 x 1220
5-32-NXI	Nomex honeycombs, 5 mm cell size, 32 kg/cbm, industrial quality	2550 x 1220

The hexagonal structure of the honeycombs enables a maximum stability and stiffness at minor bendings. Overexpanded nomex honeycombs are preferably processed on components with comparatively small radii.

PVC foam AIREX®

Closed cell, cross linked rigid foam with a high rigidity and a good stability - weight ratio. Depending on the production process different varieties are available, e.g. for hand lamination or vacuum infusion. Approved by Germanischen Lloyd. Fire tested according to DIN 5510.

art.No.	density (nominal)	thickness mm	plate width mm	plate length mm
C70.40	40 kg/m ³	5 to 80 mm	1330	2850 (1/2 plate length for thickness < 8 mm)
C70.48	48 kg/m ³	5 to 70 mm	1270	2730 (1/2 plate length for thickness < 8 mm)
C70.55	60 kg/m ³	5 to 70 mm	1150	2450 (1/2 plate length for thickness < 8 mm)
C70.75	80 kg/m ³	3 to 60 mm	1020	2180
C70.90	100 kg/m ³	5 to 50 mm	950	2050
C70.130	130 kg/m ³	5 to 50 mm	850	1900
C70.200	200 kg/m ³	5 to 50 mm	750	1600
C70.250	250 kg/m ³	5 to 80 mm	700	1500

Packing variants: Sheets, perforated on request. Grooved, single or double sided. Scrim cloth

Rigid foams

Further closed cell rigid foams made from other material (e.g. PeT, PMI) available upon request.

Flexible sandwich materials

Pressure resistant, non woven polyester fabrics are used in most of the products. They function as core material, internal distribution fabric and also as print blocker and are available in 1,5 mm to 6 mm thickness. Compared to rigid foams, smaller radii and more complex contours are possible with this core material. An overview of the different materials is available upon request.



+49 (0) 40 797 557 190 | info@hacotech.com | www.hacotech.com



Epoxy resin laminating system LR 285 / LR 385

The epoxy lamination resin systems LR 285 / LR 385 are approved by the Federal Aviation Office. They are particularly suitable for the production of ultralight aircraft, sail and small aircraft, but are also used in model construction because of their extremely good processing properties.

art.No.	specification	process	processing time (25°C/100g)	MR weight	packaging unit
LR 285	epoxy resin LBA admission	hand laminate			30 kg, 240 kg
LH 285	epoxy hardener quick	hand laminate	25 min.	100:40	5 kg, 10 kg, 25 kg, 200 kg
LH 286	epoxy hardener standard	hand laminate	60 min.	100:40	5 kg, 10 kg, 25 kg, 200 kg
LH 287	epoxy hardener slow	hand laminate	300 min.	100:40	5 kg, 10 kg, 25 kg, 180 kg
LR 385	epoxy resin LBA admission	hand laminate			10 kg, 30 kg, 240 kg
LH 385	epoxy hardener quick	hand laminate	25 min.	100:35	10 kg, 25 kg
LH 386	epoxy hardener slow	hand laminate	60 min.	100:35	10 kg, 25 kg

Infusion epoxy resin system RIMR 135 / RIMR 935

The RIMR 135 is a universal, low-viscosity, epoxy-based infusion resin system. All hardeners of the system can be mixed as desired to adjust the processing time.

The RIMR 935 is an infusion resin system with high heat resistance (T_g 135 °). It is therefore particularly suitable for mold making, industrial applications and the production of motor aircraft. It cures at a slightly elevated room temperature and the components can be final-annealed outside of the mold to achieve the maximum properties.

art.No.	specification	process	processing time (25°C/100g)	MR weight	packaging unit
RIMR 135	epoxy resin GL-certified	vacuum infusion			30 kg, 240 kg
RIMH 134	epoxy hardener quick	vacuum infusion	30 min.	100:30	25 kg, 200 kg
RIMH 1366	epoxy hardener standard	vacuum infusion	200 min.	100:30	25 kg, 200 kg
RIMH 137	epoxy hardener slow	vacuum infusion	350 min.	100:30	25 kg, 200 kg
RIMR 935	epoxy resin	vacuum infusion			30 kg, 200 kg
RIMH 936	epoxy hardener	vacuum infusion	90 min.	100:29	10 kg, 25 kg, 200 kg
RIMH 937	epoxy hardener	vacuum infusion	200 min.	100:38	25 kg, 200 kg

Toolfusion®

Two part, low viscosity epoxy infusion resin designed to produce prepreg quality, high temperature moulds at a fraction of the cost. Standard infusion vacuum bagging is all that is required to produce autoclave quality laminates.

art.No.	specification	process	processing time (25°C/100g)	MR weight	packaging unit
Toolfusion® 1A/1B	Two part, low viscosity epoxy infusion resin, high temperature resistant	vacuum infusion	75 min.	100:20	21,6 kg
Toolfusion® 3	Two part, low viscosity epoxy infusion resin, high temperature resistant	RTM/VARTM	30 min.	100:85	38,5 kg
Infusioncoat® 1A/1B	Non-sagging, high temperature surface coat	Used together with Toolfusion 1A / 1B or other applications	90-120 min.	100.11	6,1 kg



Further weights, weaves and constructions available on request. Please contact us!



Epoxy resin laminating system LR 135 / LR 235

The epoxy resin laminating system LR135 / LR235 is approved by the German Federal Agency of Aviation. It is especially suitable for the production of rotor blades including repairs, the production of yachts and other larger components. The LR235 compared to the LR135 is also crystallization fixed.

art.No.	specification	process	processing time (25°C/100g)	MR weight	packaging unit
LR 135 / LR 235	epoxy resin GL-certified				1 kg, 5 kg, 30 kg, 240 kg, 1000 kg
Hardener for epoxy resin LR 135:					
LH 134	epoxy hardener quick	hand laminate	15-20 min.	100:35	0,4 kg, 1 kg, 25 kg, 180 kg, 900 kg
LH 135	epoxy hardener standard	hand laminate	30 min.	100:35	0,4 kg, 1 kg, 25 kg, 200 kg, 900 kg
LH 137	epoxy hardener slow	hand laminate	420 min.	100:35	0,4 kg, 1 kg, 25 kg, 200 kg, 900 kg
LH 138	epoxy hardener extra slow	hand laminate	600 min.	100:35	0,4 kg, 1 kg, 25 kg, 200 kg, 900 kg
Hardener for epoxy resin LR 235:					
LH 234	epoxy hardener quick	hand laminate	20 min.	100:35	0,4 kg, 1 kg, 25 kg, 200 kg, 900 kg
LH 235	epoxy hardener standard	hand laminate	60 min.	100:35	0,4 kg, 1 kg, 25 kg, 200 kg, 900 kg
LH 237	epoxy hardener slow	hand laminate	480 min.	100:35	0,4 kg, 1 kg, 25 kg, 200 kg, 900 kg
LH 238	epoxy hardener slow	hand laminate	600 min.	100:35	0,4 kg, 1 kg, 25 kg, 200 kg, 900 kg
LH 239	epoxy hardener extra slow	hand laminate	720 min.	100:35	0,4 kg, 1 kg, 25 kg, 200 kg, 900 kg



+49 (0) 40 797 557 190 | info@hacotech.com | www.hacotech.com



HACOPOL epoxy resin laminating system HACOPOL R 131

art.No.	specification	process	processing time (25°C/100g)	MR weight	packaging unit
HACOPOL R131	epoxy resin	GL-certified			30 kg (canister), 225 kg (barrel) 1000 kg (IBC)
HACOPOL H530	epoxy hardener slow	hand laminate	120 min.	100:27	10 kg (canister), 25 kg (canister), 180 kg (barrel)
HACOPOL H531	epoxy hardener quick	hand laminate	40 min.	100:27	
HACOPOL H161	epoxy hardener standard	hand laminate	90 min.	100:25	
HACOPOL H542	epoxy hardener	hand laminate/ pressing process	20 min.	100:20	
HACOPOL H543	epoxy hardener slow	infusion/RTM/ hand laminate	450-600 min.	100:32	
HACOPOL H546	epoxy hardener quick	infusion/RTM/ hand laminate	15-20 min.	100:32	
HACOPOL H541	epoxy hardener	RTM/hand laminate	10-15 min.	100:52	

With its various hardeners the 2K epoxy resin system HACOPOL R131 covers all the important processing and character profiles. Through the usage of only one base resin it is a flexible and efficient system.

- 2K epoxy resin system with good physiological properties compatibility
- flexible resin/hardener system for a wide range of applications
- solvent-free
- Pot life can be flexibly adjusted
- Particularly suitable for carbon fiber visible parts
- Crystallization resistant even at low temperatures
- GL-certified



Prepreg resin system R 482

The epoxy resin R482, in combination with the hardener H 483 and the accelerator B 483, forms a solvent-free medium temperature hotmelt system for the production of epoxy prepregs for industrial and sports applications. Reactivity can be easily adjusted via the accelerator.

art.No.	specification	Tg (depending on the curing cycle)	Recommended Cure Schedule	Mixing ratio	packaging unit
R 482	High viscous solvent-free EP resin	120-150°C *	1h 90°C +2h 120°C	100	25 kg ,180 kg
H 483	Hardener, high viscous paste			30	25 kg ,180 kg
B 483	Accelerator, high viscous paste			8-10	25 kg ,180 kg

Polyester gelcoats PC101B/S for epoxy resin laminates

Our epoxy compatible, UP-based gelcoat provides an outstanding bond to the epoxy laminate.

art.No.	specification	RAL colours	packaging unit
PC101B	sprayable, epoxy compatible	various available	5 kg, 10 kg, 20 kg
PC101S	sprayable, epoxy compatible	various available	5 kg, 10 kg, 20 kg
MEKP KP9	MEKP hardener, medium reactivity (hardener for PC101B/S)		5 kg

Gelcoats offer an efficient surface and wear layer on many fibre reinforced components. The laminate is protected from environmental impacts and damaging UV radiation through gelcoats. **Our UP-gelcoat is available in many RAL colours as well as transparent.**



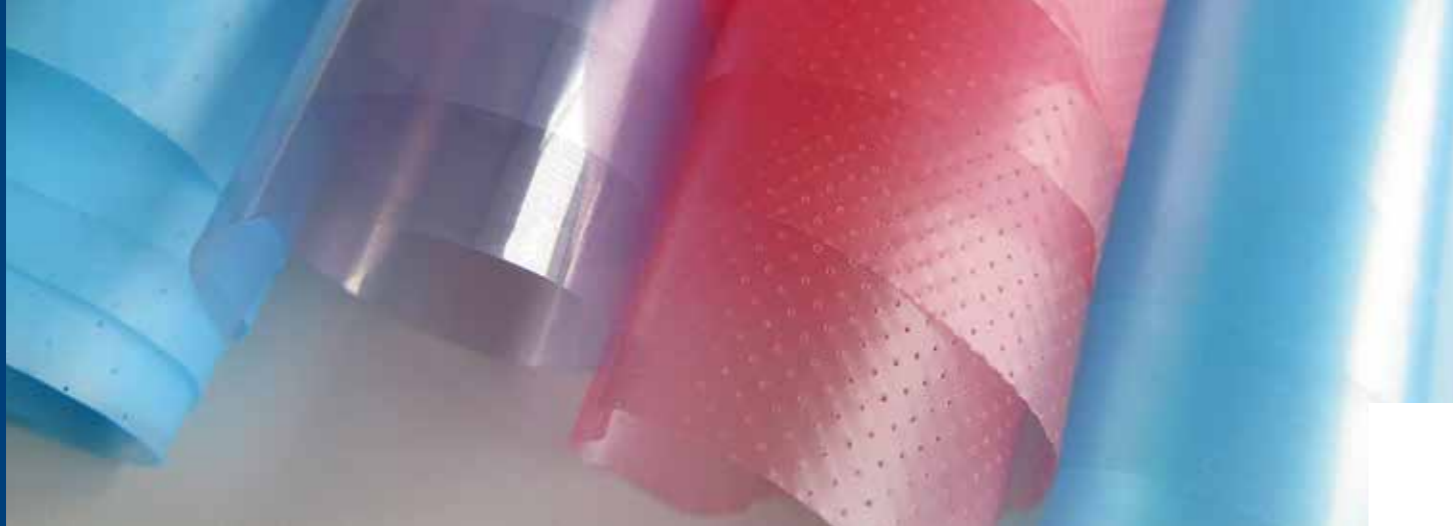
Release Agents

art.No.	name	delivery form	applicable for	purchase packaging
HACOWAX T1	Release agent	liquid	Polyurethan, epoxy resin, polyester	0,6 ltr. / 1 ltr. / 5 ltr. / 50 ltr. / 200 ltr.
HACOWAX T2	Release agent	paste-like	harsh and porous surfaces	0,5 kg / 2,5 kg
W88+	Release agent	Liquid (water based)	Sealing of mold surfaces (epoxy and polyester resins, gelcoats)	5 ltr.
Mirror wax	Release agent	paste-like	Sealing of mold surfaces (epoxy and polyester resins, gelcoats)	Resealable cans of 0,35 kg each
RA 57	Semipermanent release agent	liquid	Polyurethan, epoxy resin, polyester	5 ltr.
PVA Lack	Film release agent	liquid	Epoxid-, polyester-, vinylester resin	5 ltr.
MC 72	Cleaner	liquid	all kind of surfaces	5 ltr.
MC 399	Surface sealant	liquid	liquid sealing of porous surfaces, especially board materials, MDF, etc.	bottle 1,2 kg

Further Release agents available!

Adhesives

art.No.	specification	characteristics	MR weight	packaging unit resin	packaging unit hardener
HACOBOND A 305	2K Methacrylate structural adhesive	Short processing time (4-7 min.), fast curing, high tensile strength, thixotropic, color: black or white	100:10	30 double cartridge á 50 ml 25 double cartridge á 490 ml	
A 140 schwarz	2K Epoxy adhesive	Suitable for structural bonding, in particular CFK	100:100	12 double cartridge á 50 ml 12 double cartridge á 400 ml	
Paste 20	2K Epoxy adhesive	GL-approval, fast glue for structural bonding, toughened	100:50	double cartridge á 400 ml	
BPR 135 G	2K Epoxy adhesive	GL approval, short glass fiber reinforced, thixotropic, gap filling up to 50 mm Hardener: BPH 134G, 1355G, 137G Processing times: 50 - 150 min	100:45	30 kg 230 kg	25 kg 200 kg
BPR 535	2K Epoxy adhesive	GL approval, very high dynamic load capacity, thixotropic, gap filling Hardener: BPH 538 (slow), 536 (standard) Processing time 2-5h	100:37	30 kg 200 kg	25 kg 180 kg



Vacuum foils

Below you can find our standard range of foils. Beside you also have the possibility to purchase all foils from the manufacturer AIRTECH Europe Sarl from us. We are looking forward to give you a special offer for your individual needs!

art.No.	specification	elongation at break %	colour	thickness µm	max. use temperature °C	width mm	roll length lm
VFL100-75 (Big Blue L-100)	low temperature multi-layer bagging film for resin infusions/hand laminates, super wide	350	blue	75	121	3000-12000	56-225
Securlon® V-45	multi-layer bagging film for autoclave applications, ideal for high-performance automotive applications	400	translucent purple	50/75	171	various widths	305
VFL500-50 (Securlon® L-500Y)	wide multi-layer extruded nylon vacuum bagging film, providing multiple layers of safety. Not recommended for autoclave applications	350	yellow	50	171	various widths	110
Stretchlon® 200	high elongation elastomeric film (thermoplastic elastomer), for stretching into complex features (reduces bridging in corners) unaffected by low humidity	500	green	38	121	1520/3050	305-610
Stretchlon® 350	For components with complex contours using the vacuum process Stretchlon is an excellent choice, because the very high elongation makes it possible to stretch the film into to draw the complex shape. For all epoxy resin systems	>550	Grau	75	162	3050	229
Stretchlon® 800	Soft, flexible nylon vacuum bagging film, highest elongation from all nylon films, especially for parts with multiple contours, easy to work with, unaffected by low humidity	450	orange	50	204	up to 3560	152,5-305
VFL540-50/75 (Wrightlon® 5400)	high temperature nylon vacuum bagging film with good elongation, easy to work with, providing good vacuum levels for good quality parts	375	clear	50/75	180	up to 7110	152,5-305
Wrightlon® 600V	nylon vacuum bagging film, performs also with high preasure in autoclaves	400	violet	50/75	204	various widths	various lengths
VFL740-50/75 (Wrightlon® 7400)	nylon vacuum bagging film, also offered with embossed, cracked ice pattern making it a breather, release film and vacuum bag all-in-one, for high temperature	400	green	50/75	204	up to 9000	various lengths
Dahlar® Release Bag 125	Polyolefin, multi-layer vacuum bag with excellent release properties, also offered with embossed, cracked ice pattern making it a breather, release film and vacuum bag all-in-one, for high temperature	400	green	25-78	140	up to 6600	152,5-610
Thermalimide E	high performance bagging film for extremely high temperature applications, Superior toughness of film in comparison to metallic foils helps avoid bag tearing	85	amber	50	426	1030/1500	78

Vacuum foils in tube form | Release and perforated films

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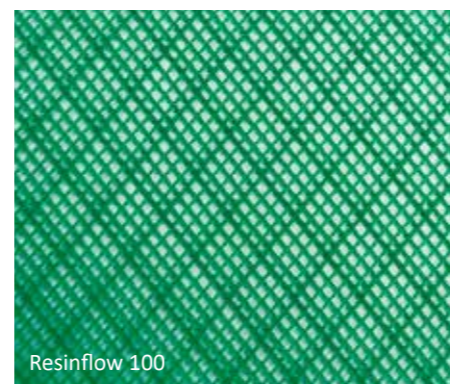
art.No.	specification	elongation at break %	colour	thickness µm	max. use temperature °C	width mm	roll length lm
Vacuum foils in tube form							
V-45 LFT (Securlon® V-45)	multi-layer bagging film, ideally suited for high performance automotive applications where autoclave processing is required	400	translucent purple	50	171	various widths	305
VFL540-50/75 LFT (Wrightlon® 5400)	nylon bagging film with good elongation for cure temperatures up to 180°C, easy to work with, providing good vacuum levels for good quality parts	375	clear	50/75	180	various widths	305
VFL740-50/75 LFT (Wrightlon® 7400)	high temperature nylon film with high elongation, also offered with our embossed, cracked ice pattern making it a breather, release film and vacuum bag all-in-one	400	green	50/75	204	various widths	305
SL850-50 LFT (Stretchlon® 850)	highly flexible bagging film, recommended for epoxy and BMI resins	450	orange	50	204	various widths	305
Release and perforated films							
WL3700 (Wrightlon®3700)	release film for commercial and wind energy applications, perforated/various perforations	550	blue	25/50	121	1520	610
WL3900 (Wrightlon®3900)	polyolefin release film, also suitable for compaction and debulking operations, various perforations	500	red/blue	25/30/50/75	157	2030/2030/6100/6100	1000
WL4600 (Wrightlon®4600)	polyolefin copolymer release film, for use in flat or limited curvature moulding applications, various perforations	250	blue/clear	38/50	193	3050/1370	various lengths
RFA520 (Wrightlon®5200)	high performance fluoropolymer release film, good elongation and strength reduces tearing and bridging in corners, various perforations	350	red/blue	15/25/50	260	1220/1520	183/183
RFA005-1000	Release film, self adhesive (supported with glass fabric), providing a semi-permanent release for flat tools, unperforated	-	light brown	113	260	1000	16,5
Autorelease	Release film with excellent strength and elongation characteristics. Not recommended for use with polyester or vinyl ester resins	350	brown	25	180	1500/3000	1520
Dahlar MLF52	fluorocarbon shrink tape, high elongation, eliminating wrinkles, releases from any resin system, does not have any release coating but will exhibit natural release characteristics	-	blue	50,8	232	various widths	91,4
A575	polyester high shrink tape, ideal for mandrel wrapping aircraft tubular parts, golf shafts, tennis rackets, fishing rods, etc.	-	clear	50,8	204	various widths	91,4
A575 RC	polyester high shrink tape, coated with a non-silicone release agent for direct release	-	clear	50,8	204	various widths	91,4



Infusion meshes

Below you can find our standard range of Infusion meshes. Beside you also have the possibility to purchase all foils from the manufacturer AIRTECH Europe Sarl from us.

art.No.	specification	colour	weight g/m ²	max. use temperature °C	width mm	roll length lm
Greenflow 75	high performance, low profile resin distribution medium, can be used with polyester, vinylester and epoxy resins	green	98	150	1040	106,7
Resinflow 100	extruded resin distribution medium, does not fray when cut or roll up at the ends	green/white	252	125	1200	50
Knitflow 160	drapable knitted resin distribution medium, high resin flow speed, works with polyester, vinylester and epoxy resins	orange	160	125	1500	100
FlowLease 160-37P16	combined product of Resinflow 160 and release film Wrightlon® 3700 P16, for resin infusion applications	blue	160	121	1500	100
TubeMesh	sewed tubular mesh, designed to include any size of spiral wraps	white	178	125	12	50



Flow lines

Below you can find our standard range of flow lines. Beside you also have the possibility to purchase all foils from the manufacturer AIRTECH Europe Sarl from us.

art.No.	specification	Internal Diameter mm	max. use temperature °C	length mm
OF313, OF500, OF750 & OF1000	silicone rubber omega flow lines, reusable, replacing spiral wrap polyethylene feeder lines	8 13 19 25,4	260	1500
OF 625V & 750V	vinyl omega flow lines, reusable, replacing spiral wrap polyethylene feeder lines	16 19	71	250
Resintrak	knitted tape made of polyester, very high resin permeability, transports resin along the surface and into the part, width: 43 mm, white	-	250	2500
Vactrak	knitted tape made of polyester, combined with double sided tape, width: 43 mm, white	-	250	2500

Processequipment

art.No.	specification	tube connection inch	max. use temperature °C
VAC-RIC LT	low temperature resin infusion connector with flat base	1/2, 5/8, 3/4	80
VAC-RIC HT	high temperature resin infusion connector with flat base	1/2	260
RIC	Resin infusion connector	1/2, 5/8, 3/4	80
RIC HT	High temperature resin infusion connector	1/2, 5/8, 3/4	180
RIA	Resin Infusion Adapter for connection between the resin inlet tube or vacuum line and all resin Infusion connectors (RICs)	1/2, 5/8, 3/4	-





Hoses | Clamps | Connectors | Resin traps



Hose clamp



"T" fitting



Resin trap RB 91

art.No.	outer diameter mm	internal diameter mm	packaging unit
Vacuum spiral hoses			
SP05	5	4	25 m
SP10	10	9	25 m
SP14	14	12	25 m
SP20	20	18	25 m
Vacuum hoses			
Econoflow 59R	19	9,5	up to 30 lm
Airflow 60R	19	9,5	up to 10 lm
PE-tube 8 x 6	8	6	50 lm
PE-tube 10 x 8	10	8	100 lm
PE-tube 12 x 10	12	10	50 lm
Silicone tube and equipment			
SIL-TUBE (heat resistant up to 230°C)	14	8	25 lm
HOSE CLAMP B	Hose clamp for SIL-TUBE / 20 x 20 mm		1 piece
Hose clamp blue	Hose clamp for 2-15 mm		1 piece
Hose clamp red	Hose clamp for 2-20 mm		1 piece
"T" fitting			
TS06PP	"T" fitting made of polypropylen (for 6 mm internal diameter)		10 piece
TS08PP	"T" fitting made of polypropylen (for 8 mm internal diameter)		10 piece
TS12PE	"T" fitting made of polypropylen (for 12 mm internal diameter)		10 piece
TC 7-10 mm	Hose connector (straight) made of polypropylen, for 7-10 mm internal diameter		1 piece
Ball valve			
IV12PE	Polyethylen for 12 mm 1/2" tubes		1 piece
Resin traps			
RB 91	Vacuum reservoir for resin infusion, 10 litres tank size, Tank diameter 16 cm, Vacuum source 1/4 inch male NPT, Resin inlet 3/8 inch female NPT		1 piece
RB 451	Vacuum reservoir for resin infusion, 30 litres tank size, Tank diameter 30 cm, Vacuum source 1/4 inch male NPT, Resin inlet 3/8 inch female NPT		1 piece
Stiffy	Vacuum reservoir for resin infusion, 23 litres tank, transparent cover, manometer included		1 piece

Connectors | Couplings

art.No.	specification	diameter base plate mm	Service temperature °C
Valves and equipment			
Vac Valve 399	inexpensive machined aluminium twist valve, that is inserted through the vacuum bag, 2 pieces: base plate/top piece, works with AQD 500TF quick disconnect (see below)	63	260
Vac Valve 401 & 401C	twist lock through bag connector, that is inserted through the vacuum bag, 2 pieces: base plate/top piece, works with AQD 500TF quick disconnect (see below)	63	260
Vac Valve 402 & 402A	three piece threaded vacuum valve with locking ring, allows for a tighter connection with an increase in autoclave pressure, made of carbon steel/aluminium	63	260
Vac Valve 425	self cutting vacuum valve, which perforates the bagging film when the top piece is inserted and threaded into the base plate, made of carbon steel/aluminium	50	260
AQD 500TF MALE/FEMALE	Two piece quick disconnect with check valve, compatible with vacuum valves and vacuum tubes, made of carbon steel	-	260

Leak detectors and pressure gauge

art.No.	specification
Vac-Gauge 40D	digital Vacuum Gauge used for leak detection and vacuum determinations under your vacuum bag, offers vacuum readings in four selectable units: mBar, mmHg, inHg, and KPa
VacLeak LEQ-70	standard ultrasonic vacuum leak detector, for finding leaks in vacuum bags, sealant tapes, tubes and fittings, converts the ultrasonic sound produced by leaks to an audible level and also visually displays the leak on an LED meter., the sound is further amplified as the receiver is placed closer to the leak source
DV 2	Digital pressure gauge, application range: Vacuum condensation, application temperature: -20 to +50 ° C, Size: 250 x 165 x 55 mm, weight: approx. 500 g, measured value sensor: absolute pressure sensor, measuring range vacuum: 1.100 to 0 mbar, resolution: 0.01 hPa / 10 micron, Accessories: Connection adapter for cable with an inside diameter of: 6 mm, 8 mm, 10 mm



DV 2



Peel ply

Through the use of peel ply a quick processing after the lamination and a perfect surface adhesion are achieved. When epoxy resins set kapamat develops due to a reaction with the moisture in the air. A binding of further laminate layers or durable adherences are prevented through the kapamat film. After removing the peel ply the rough and clean surface enables a maximum effect for following adhesions. Various width and webbings assure efficient working methods when using our high-quality peel-ply.

art.No.	specification	weight g/m ²	max. use temperature °C	width mm	roll length lm
PP067	Plain weave, very fine surface, washed/ heat setted, without tracer	67	190	25-1300	200
PP083	Plain weave, washed/heat setted	83	190	25-1500	92-275
PP100T	Twill weave, washed/heat setted	100	190	750	100
PP105	Plain weave, washed/heat setted	105	190	200, 350, 1000, 1470	200
Release Ply A	Non-coated nylon peel ply, highly drapable with a more open weave style	80	232	1520	200
Release Ply B	Non-coated nylon peel ply with tight weave, produces a "fine" texture	62	232	1520	200
Ultra Ply 22 T	Non-coated polyester peel ply with good drapability, twill weave	95	204	1520	229
Bleeder Lease® A	Coated nylon peel ply, high temperature fabric coated with a silicone release agent, easy release from most prepregs and resin systems, green	80	232	1520	91
Bleeder Lease® B	Coated nylon peel ply, high temperature fabric coated with a silicone release agent, easy release from most prepregs and resin systems, green	62	232	1520	91
Econostitch®	Non-coated nylon peel ply with red tracers, heat setted, especially for resin infusions or hand lay-up processes, white/red	88	190	1520	275
Econostitch® G	Polyester peel ply with black tracers, heat setted, good performance when used with both polyester and epoxy resins	85	190	1800	200
Release Ease® 234 TFP	Porous PTFE coated fibreglass fabric, provides release from all conventional resin systems. Porous products will allow excess resin, volatiles and trapped air to escape into the breather during cure while non-porous products will retain resin, brown	88	288	up to 1520	91-100
Dahltextx® SP-2	Air permeable resin barrier material, toolside breathing and bag side breathing to aid the removal of air but still contain resin, only intended for vacuum applications, light blue/white	140	177	1470	150
Dahlpac MC79	Vacuum breather pad with zero resin bleed for resin infusions, speed up infusions with multiple resin feeds and avoid dryness where flow fronts meet, blue	677	125	100	25

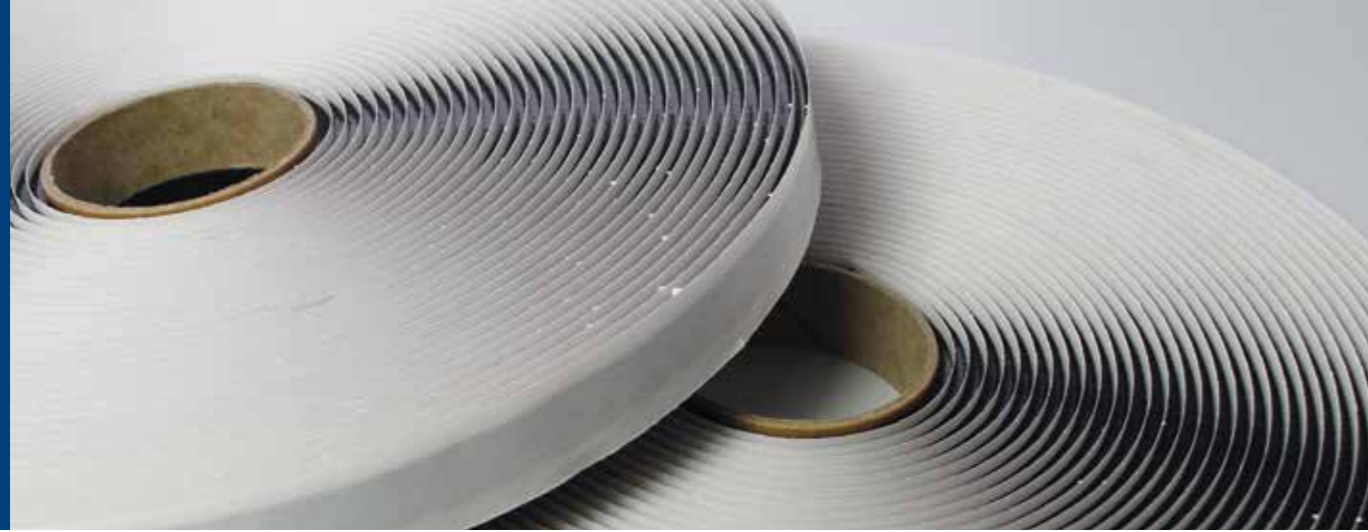
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Breather/Bleeder

Absorbent nonwoven fabric for absorbing superfluous resin in vacuum infusions. At the same time, excess air is also transported away and the pressure is evenly distributed over the mold during the infusion. As a result, the laminate has a high fiber volume fraction.

art.No.	specification	weight g/m ²	max. use temperature °C	width mm	roll length lm
Airweave® N4	Medium weight non-woven polyester breather/bleeder, a good breather for low pressure cures, white	140	204	1520	100
Airweave® N10	Heavy weight non-woven polyester breather/bleeder, used for higher pressure cures, offers good elongation and cushions any sharp radius for vacuum bag protection, the non-woven construction provides good conformity, white	339	204	1520	50
Airweave® Super 10	Heavy weight polyester breather/bleeder with superior airflow, high denier polyester fibre breather designed for high pressure cures in the autoclave. The higher denier allows for better airflow under temperature and pressure. Non-woven construction provides good conformity, white	339	204	1520	50
Ultraweave® 406	Light weight non-woven nylon breather and bleeder, has a higher temperature softening point and will not compress like polyester allowing for increased airflow., white	135	232	1520	45
Ultraweave® 1020	Nylon non-woven breather/bleeder, has a higher temperature softening point and will not compress like polyester allowing for increased airflow, was developed for cure temperatures up to 232°C. One layer of Ultraweave® 1020 will conduct away volatiles at pressures exceeding 7 bars. Designed for all resin systems. Ultraweave® 1020 will stop back pressures in autoclave lay-ups and eliminates porosity in the laminate due to seal off. Ultraweave® 1020 is capable of multiple cycles, white	339	232	1520	50
Airweave® UHT 800	Non-woven ultra high temperature fibreglass breather, a non-woven blended, fibreglass breather. It is safer to use this breather in place of a woven fibreglass breather, makes an easier transition for the vacuum bag and in any radius, white	610	427	1170	45





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Sealant Tape

With the highly self-adhesive sealant tapes, you can fix foils flexibly on the mold and seal this airtight for vacuum infusion. Depending on the process, sealant tapes are available for various temperature ranges.

art.No.	specification	width mm	max. use temperature °C	packaging unit
Airseal 2 / Tacky / Super Tacky	Vacuum bag sealant tape for room and medium temperature applications, it can also be used for higher temperature envelope bag applications. Available as standard tack version, superior tack (for colder environments) and very soft and very high tack version	12	150°C (bag to tool) 180°C (bag to bag)	20 rolls (15 m/roll)
Airseal 3WT	Vacuum bag sealant tape with good adhesion properties, suitable for vacuum assemblies with curing temperatures up to 180 °C, can be easily removed	12	180	20 rolls (15 m/roll)
AT-199	Low profile vacuum bag sealant tape for economic applications, the reduced cross section of the tape provides a greater product yield but still maintains a good vacuum seal for vacuum bagging applications from room temperature to 121°C	9,5	121	40 rolls (15 m/roll)
AT-200 Y	Multi-purpose sealant tape, high tack, it removes easily from metal or composite tools	12	204	40 rolls (7,5 m/roll)
GS-213 / Tacky	Standard vacuum bag sealant tape for metal and composite tools, excellent tack, great clean-up	12	204	40 rolls (7,5 m/roll)
AVBS 750	High tack and high temperature sealant tape, secondary beads of sealant are not required and clean up after cure is good	18	400	4 rolls (10 m/roll)

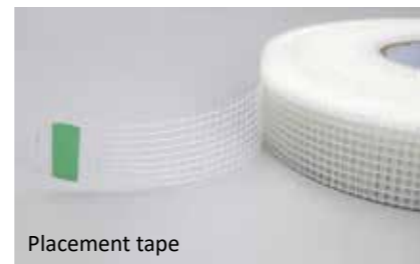
Fixation

Spray adhesives with a uniform spray pattern ensure fast and safe preparation of vacuum infusions or vacuum baggings.

art.No.	specification	packaging unit
Spray adhesive		
AIRTAC 2	Spray contact adhesive for temporary bonds, can be used on materials needing extra tack for placement on vertical or difficult surface areas. This product is ideally suited for tool shop applications such as temporary placement of details and pattern fabrication, non CFC, content: 679 ml	12 cans
AIRTAC 2E	Same features as AIRTAC 2, with alternative spray nozzle, content: 500 ml	12 cans
ECONOTAC 2	Economical contact spray adhesive for temporary bonding applications to hold dry fabric, core and processing materials in place when utilizing resin infusion and other composite fabrication processes, wide conical spray pattern for increased coverage, content: 691 ml	12 cans
Placement tape		
Tac-Strip	Dry fabric placement tape, coated on both sides with a "high-tack" pressure sensitive adhesive, very clean when compared to spray adhesives, width: 2,54 cm/5,08 cm, length: 90 m	1 roll



Spray adhesive



Placement tape

Adhesive tapes

Flashbreaker® adhesive tapes are tensile polyester films for high temperatures, coated with a fully cured silicone adhesive for use in the oven or autoclave at temperatures up to 204 °C. The orange Flashbreaker® tape is very visible on components and devices. Flashbreaker® adhesive tapes are used for various applications in metal bonding and composite processing, such as the fixation of vacuum assist materials, thermocouple wires, masks for etching, or in riveting workshops. Flashbreaker® adhesive tapes can easily be removed after the curing process.

art.No.	specification	width mm	max. use temperature °C	packaging unit
Flashbreaker® 1	All purpose pressure sensitive tape, high temperature/ high tensile strength, blue/orange	various widths	204	6 rolls
Flashbreaker® 2	Stronger version of Flashbreaker® 1, can be used anywhere extra strength is needed, blue/orange	various widths	204	48 rolls
Flashbreaker® 1 (HT)	For heavy duty hold down applications where a high level of adhesion is required, yellow	254	204	36 rolls
Flashbreaker® 2 (HT)	Stronger version of Flashbreaker® 1 (HT), yellow	254	204	36 rolls
Airhold 1 CBS	High temperature double-backed holding tape, to hold release plies, release films and breathers in place during lay up and vacuum bagging machining operations, clear	254	204	36 rolls
Airhold 10 CBS	Double-backed tape for holding honeycomb core during machining, while allowing the core to be removed without residue, white	254	60	48 rolls
Tooltec® A005	Reinforced PTFE coated fibreglass with silicone adhesive, designed to adhere to tool surfaces providing semi-permanent release and a reconditioned surface, light brown	1000	260	1 roll
Tooltec® A007	Stronger version of Tooltec® A005, light brown	1000	260	1 roll
Airkap 1	Polyimide high temperature pressure sensitive tape, holds down peel plies, breathers, vacuum bag pleats, thermocouples, etc. on high temperature cures, in an oven or autoclave, amber	various widths	399	72 rolls

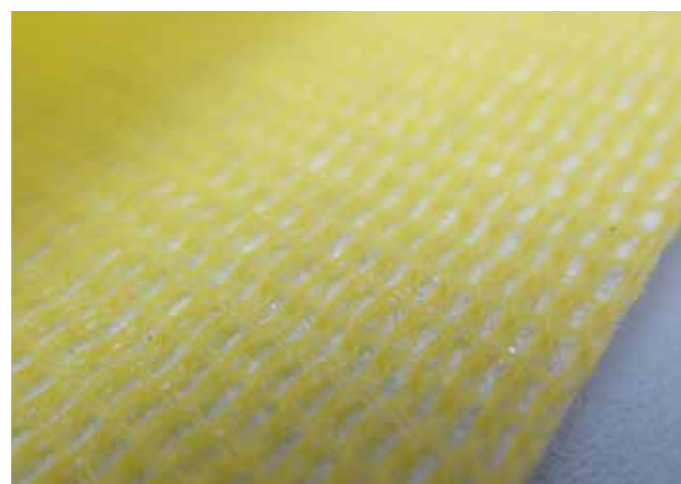




HACOPEEL multifunctional fleece for vacuum processes

HACOPEEL has been developed for vacuum bagging and/or vacuum infusion processes. It combines the characteristics of several auxiliary materials and ensures significantly more effective working times, since only one layer has to be applied in vacuum construction instead of two or three individual layers. In addition, the material can be removed much more easily than peel plies. The versions RF and X2 leave a smooth surface, while SRF and X3 give a rough surface (similar to peel plies).

art.No.	specification (material substituted...)	weight g/m ²	process	width mm	roll length m
HACOPEEL-RF-300	Perforated foil and resin flow medium	315	Infusion	1150	61
HACOPEEL-SRF-300	Peel ply, perforated foil and resin flow medium	315	Infusion	1520	61
HACOPEEL-X2-150	Perforated foil and breather/bleeder	150	Prepreg, Bagging	1520	61
HACOPEEL-X3-150	Peel ply, perforated foil and breather/bleeder	150	Prepreg, Bagging	1200	61
HACOPEEL-X2-250	Perforated foil and breather/bleeder	250	Prepreg, Bagging	1520	61
HACOPEEL-X3-250	Peel ply, perforated foil and breather/bleeder	250	Prepreg, Bagging	1520	61



Filler

With pyrogenic silicid acid (Aerosil 200) the right thixotropy and thickening of epoxy resins can be achieved. That's how spatulas and viscous resins for corners and edges can be self made. Fillers such as phenolic microballoons or glass hollow spheres allow an easy mix, that don't cause any exothermic problems.



art.No.	specification	fibre length mm	packaging unit kg
Aerosil 200	Pyrogenic Silica	grain size: 12 µm	10
Cotton flakes 30	Cotton flakes white	0,35 mm	30
Glass Bubbles 012	Micro glass bubbles	density: 0,12 g/cbm ³	27,22
Phenolic Microspheres	Microspheres based on phenolic resin, brown	0,065 - 0,090 mm	12
SCF	Carbon short fiber	2 - 10 mm	5, 10, 20
SCF powdered	Carbon short fiber powdered	0,2 / 0,15	5, 10, 20
SGF	Glass short fiber	3 - 12	5, 10, 20
SGF-02	Glass short fiber powdered	0,2	25
Aluminium powder	Aluminium powder	0,3	25



Hot Bonder for temperature and vacuum controlling

art.No.	specification
HOT BONDER DUAL ZONE	Temperature and vacuum controls, 2 separate controls, can also be linked, 20 T-sensors, records via USB or print. AIRBUS-certification, integrated vacuum pump, sensor version K or J.
HOT BONDER SINGLE ZONE	Temperature and vacuum controls, 1 zone, max. of 6 T-sensors, records via USB or print, AIRBUS-certification, integrated vacuum pump, sensor version K or J.
ECO BONDER	Temperature and vacuum controls, 1 zone, max. of 6 T-sensors, records via print, USB optional, vacuum pump, sensor version K or J.
NEW HOT BONDER 4 Zones	Dual Hot Bonder, but with the possibility to control different 4 zones independently. Ideal for complex repairs with different materials and sections.
NEW Wireless System	This new system allows you via a laptop to control one or several Wireless Module in order to repair in same time multi zones. Through the wireless system the operator can control the cure within a reasonable distance without to be close to the repair area.

Heater mats

art.No.	dimensions mm
Flexible heater mat 230V, 50HZ	100 x 100 bis 500 x 500
Stretchy heater mat	150 x 150 bis 630 x 750

Our heating mats are made specifically for the repairs of composite structures, to spread the heat equally throughout the vacuum. They are made of silicone and are very flexible, so that they adjust to all surfaces. Towards that the heating mats also come with ports to link directly to the Hot Bonder AHB380DV2.

Infrared lamps

art.No.	specification
IRPE Premium LAMP WITH CONTROLLER	For tempering small areas with a homogenous temperature distribution ($\pm 3^{\circ}\text{C}$ at 95°C). Suction cup mount for exact placement, inbuilt Hot Bonder controls.
BABY LAMP	Basic version, to be connected to a Hot Bonder, 1.000 W or 2.000 W.
IRS LAMP WITHOUT CONTROLLER	Efficient, swivelling IR lamp for precise tempering cycles, to be connected to a Hot Bonder, 3.300 W or 6.600 W.
IRPE LAMP WITH CONTROLLER MOVEABLE HEAD	Like the IRS LAMP, but comes with inbuilt Hot Bonder controls.



Hot Bonders are very sophisticated systems, allowing to manufacture, repair and cure composite structures. Depending on the model you can receive Hot Bonders up to 2 independent single zone units and with up to 20 temperature sensors. On each zone you can connect heating mats or lamps with up to 32 amperes.



Autoclaves

art.No.	specification
LAB 115: \varnothing 1 m x 1,5 m	preassure max.: 10 bar temperature max.: 220°C thermo sensor: 4-6 vacuum zones: 2-4 20°C to 220°C : $3^{\circ}\text{C}/\text{min}$ 220°C to 60°C : $3^{\circ}\text{C}/\text{min}$ power connection: 125 Amp, 410V
LAB 120: \varnothing 1 m x 2 m	
LAB 130: \varnothing 1 m x 3 m	
LAB 1530: \varnothing 1,5 m x 3 m	
LAB 1540: \varnothing 1,5 m x 4 m	

Larger autoclaves are available according to customer requirements. You will receive a turnkey solution in which all necessary connections are already integrated. Only the electricity and compressed air supply must be provided.





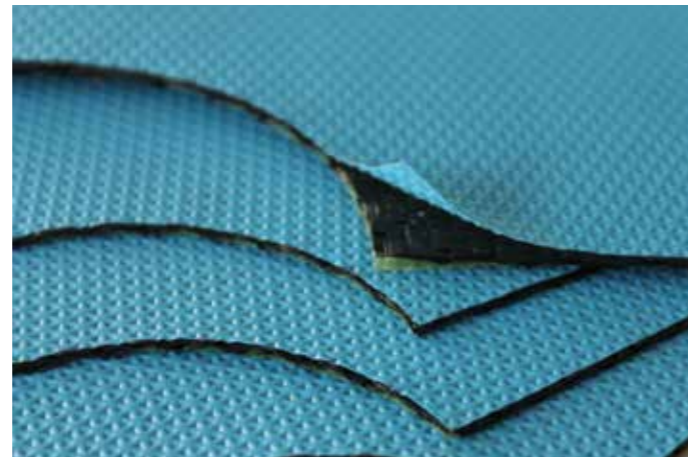
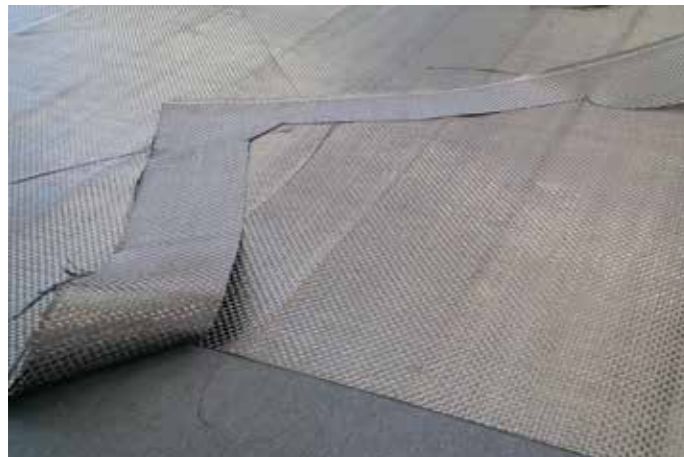
Precision cutter

Renowned companies in aviation and automotive fields already rely on the high-performance process technology from the Innovation/Tradition company ARISTO. The flatbed cutting machines are also used in Research & Development.

With the ARISTOMAT TL- High Speed Cutters, ARISTO presents a completely new generation of flat bed plotters. Clear-cut design, work surface easily accessible from all sides, extremely robust traverse bridge, the most modern drive- and steering technologies, non-slip drive, most efficient matrix-vacuum and easy user guidance with the PC-Software ARISTO CutterControlPanel are the outstanding characteristics.

Available sizes: width: 1300mm, 1600mm, 1900mm
length: 1000mm, 1700mm, 2500mm

Essential functions such as manual control or setting of origin can be carried out from any point of the cutter by means of a mobile control pad.



We would be pleased to advise you on the subject in detail - including the demonstration of the machine at our site with cutting test. Please make an appointment with us!



Rental of vacuum pumps

Your vacuum pump is defective? You need to bridge the time to the new purchase? When you buy a vacuum pump from us, you will receive a rental pump free of charge until delivery.

You need a backup pump for a large project? Or do you only occasionally manufacture components by vacuum infusion? Then you don't need to buy a pump immediately: You can also rent the equipment from us simply and easily.

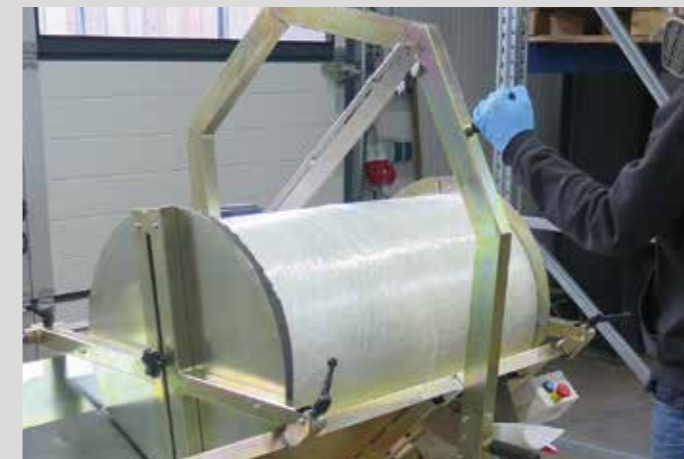
We offer different sizes for your individual use and will be glad to advise you about the suitable pump, how to use it and the necessary equipment.



Service for cutting

To optimize your production process we supply raw-materials and semi-finished products ready-made.

- > the cutting of fabrics, multiaxial reinforcements, as well as auxiliary materials like foil and fleece according to the customer's demand
- > ready-made fibres form CAD-files and templates
- > the sizing of core materials
- > the production of full laminate and composite panels up to a size of 1250 x 2500mm out of different core materials
- > Full laminate panels





Trainings

Would you like to establish new production techniques in your company; or introduce new employees efficiently into your working process? We offer you customized training in the following areas. All training modules can be customized according to your individual requirements. Please understand the stated duration and number of participants as a recommendation.

We will be glad to advise you which content is right for you.

Composite Start ★

As an introduction to the fibre-reinforced construction methods and to give an overview of the most important aspects of composite manufacturing with duroplasts we offer the module "Composite Start". For newcomers in the industry this training course provides extensive information. Due to the diversified spectrum of subjects it is suitable for a wide range of employees from different departments.

- Duration: 2 days
- Participants: 10-15 persons
- Content:
 - > What is fiber composite?
 - > Materials
 - > Matrix
 - > Processing
 - > Job safety



Composite Special ★★★

When it comes to the introduction of a specific manufacturing procedure such as the vacuum infusion we can support you with adequate training course or also technical advice. In the "Composite Special" module theoretical aspects are illustrated and methodical approaches or troubleshooting are put across. We offer especially the following training modules:

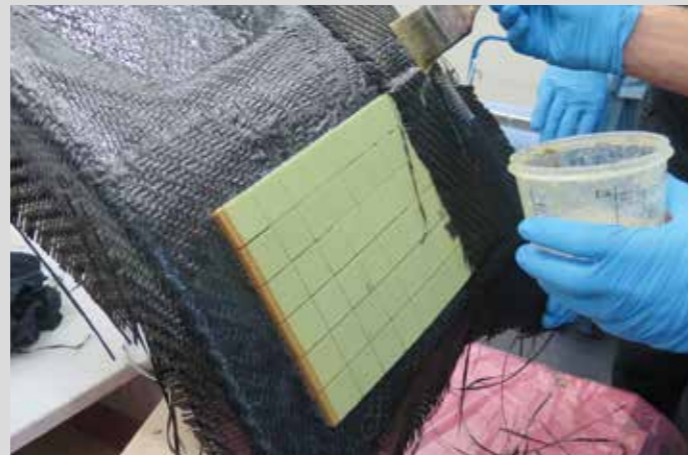
- > Manual laminating
- > Vacuum bagging
- > Vacuum infusion
- > RTM Resin Transfer Moulding
- > Prepreg processing



Composite Advanced ★★

In the "Composite Advanced" training course we discuss further aspects of the fibre-reinforced construction, which occur - at the latest - at the beginning of the manufacturing and construction. Subjects such as inspection and quality management or also construction principles are discussed here. A lot of companies that are already experienced in construction work have to rethink at this point, because in comparison to classic construction material fibre-reinforced materials do put different demands on the whole approach.

- Duration: 2 days
- Participants: 5-10 persons
- Content:
 - > Materials and processing
 - > Quality assurance
 - > Test procedures
 - > Fibre-suited production
 - > Sandwich constructions
 - > Basic principles of dimensioning
 - > Model cases



Further weights, weaves and constructions available on request. Please contact us!

+49 (0) 40 797 557 190 | info@hacotech.com | www.hacotech.com



Tools, equipment and facilities



art.No.	specification	packaging unit
Equipment		
Pouring tap	Pouring tap 51 mm (for 10 kg canister) Pouring tap 61 mm (for 30 kg canister)	1
Wide jaw-locking pliers	Wide jaw-locking pliers 205 mm	1
Barrel opener	Barrel opener made of steel	1
Laminating brush 20	Laminating brush, 20 mm wide	100
Mixing cup	Mixing cup 750 ml Mixing cup 1400 ml Mixing cup 2300 ml	100
Mixing propeller	Mixing propeller Diameter: 100 mm, shank length: 40 cm	1
Plastic spatula 12 x 8	Plastic spatula 12 x 8 cm	100
Tools		
TS	Aramid textile scissors 20 cm (section length: 8,5 cm) 25 cm (section length: 12 cm) 30 cm (section length: 14 cm)	1
Resin line clamp	Clamping pliers with flange, tubes can be individually disconnected from the vacuum in order to interrupt the resin flow	
Facilities		
2K-HDA	2K-manual dosing system, presetting of the mixing ratio according to customer requirements	1
Vacuum pumps	Vacuum pumps, different models on request	1
Drum turner 200	Drum turner, mobile, with handle	1
Barrel heater 200	Barrel heater for 200 ltr. standard barrel, dimensions: 180 x 1650 mm	1



Toolkits

art.No.	specification
Composite repair toolkit light tool case	Tool set for composite repairs, contains the tools to prepare the damaged section for the repair
Composite repair toolkit premium level	Extensive tool set for composite repairs. Contains all the tools and material needed for the repair



Job safety

art.No.	specification	packaging unit
Half mask 3M™ 6000	Anti-gases, vapors and particles, reusable and low-maintenance, double filter system for lower breathing resistance and good weight distribution, wide field of view, soft lightweight mask body for fatigue-free work, stable head support and easy-to-close neck strap, 3M™ filter bayonet closure system	1
Fine dust mask	Filter class FFP2 with exhalation valve (eg against wood and metal dusts (iron, steel), cement and plaster dust, brick and tile dust, paint drops and splashes), disposable article	15
Disposable gloves	Nitrile/Latex, powdered/powder-free, Size S to XXL	100
Safety glasses	Stylish panoramic single-lens glasses, top edge and lens from one cast, scratch-resistant coating, soft nose pads, optimized fit, UV-protection, also usable as sports glasses, unisex, weight approx. 21 g (ultralight), norm: EN 166, disc: polycarbonate, clear	1



Half mask 3M™ 6000



Fine dust mask

MANAGEMENT SYSTEM CERTIFICATE

Certificate No:
183502-2015-AQ-GER-DAKKS

Initial certification date:
17. September 2015

Valid:
18. September 2018 - 17. September 2021

This is to certify that the management system of

HACOTECH GmbH

Helmut-Nack-Str. 6d, 21035 Hamburg, Germany

has been found to conform to the Quality Management System standard:

ISO 9001:2015

This certificate is valid for the following scope:

**Procurement, intermediate storage and delivery of products to companies in the fiber composite industry.
Consulting on the application of the products offered on behalf of recognized educational institutions.**





HACOTECH GmbH

Helmut-Nack-Straße 6d
21035 Hamburg
Germany

Telefon: +49(0)40/797 557-190

Fax: +49(0)40/797 557-199

E-Mail: info@hacotech.com

Website: www.hacotech.com

