

UMATEXTM

ROSATOM
STATE CORPORATION

CARBON
FIBER
FABRICS
PREPREG



RUSSIA'S LARGEST PRODUCER OF CARBON COMPOSITES

UMATEX is a composites division of Rosatom. It is the largest group of companies producing modern high-strength and high-modulus carbon fiber, fabrics and prepregs in Russia.

UMATEX structure:

- **NPK Khimprominzhiniring JSC, Moscow**
Managing company, headquarters.
 - **R&D Centre, Moscow**
The centre is involved in the development and integration of technologies to produce PAN precursor and carbon fiber, fabrics and prepregs.
 - **ALABUGA-FIBRE LLC, Yelabuga**
State-of-the-art carbon fiber manufacturing plant.
Production capacity is more than 1400 tonnes per year.
 - **Prepreg-ACM JSC, Moscow**
Production of a wide range of unidirectional, bidirectional woven and non-woven fabrics and tapes, multi-axial fabrics and prepregs.
 - **Argon LLC, Balakovo, Saratov Region**
Production of carbon fiber for various industries.
 - **ZUKM LLC, Chelyabinsk**
Production of carbon-based composites, carbon fiber reinforced plastics, heat insulating carbon materials.
 - **ZARYAD, Naberezhnye Chelny (JV 50/50)**
Sports equipment based on carbon composite materials.
 - **Trading House in Prague, Czech Republic**
Carbon fiber, fabrics, prepreg sales in the EU.
 - **Trading House in Shanghai, China**
Carbon fiber, fabrics, prepreg sales in Asia.
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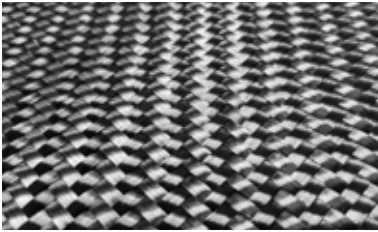
CARBON FIBER

UMT is high-strength polyacrylonitrile (PAN) based carbon fiber. It has been developed for use in structural composite applications in wind energy, marine, and automotive industries.

product	tensile strength	tensile modulus	elongation	yield	density
<i>standard modulus</i>					
UMT40-3K-EP/VE	4.0 GPa	260 GPa	1.5 %	190 tex	1.77 g/cm ³
UMT45-12K-EP/VE	4.5 GPa	260 GPa	1.7 %	780 tex	1.78 g/cm ³
UMT49-12K-EP/VE	4.9 GPa	260 GPa	1.8 %	760 tex	1.78 g/cm ³
UMT42-24K-EP/VE	4.2 GPa	260 GPa	1.5 %	1530 tex	1.78 g/cm ³
UMT40-48K-EP/VE	4.0 GPa	250 GPa	1.5 %	3100 tex	1.78 g/cm ³
<i>Intermediate modulus</i>					
UMT290-12K-EP/VE	4.4 GPa	290 GPa	1,1 %	730 tex	1.74 g/cm ³
<i>high modulus</i>					
UMT400-12K-EP/VE	4.2 GPa	400 GPa	1.1 %	710 tex	1.82 g/cm ³
UMT430-12K-EP/VE	4.0 GPa	430 GPa	1.0 %	700 tex	1.84 g/cm ³
UMT530-12K-EP/VE	3.5 GPa	530 GPa	0.7 %	680 tex	1.92 g/cm ³



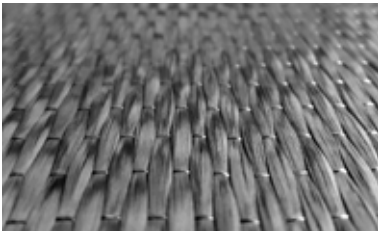
FABRICS



Balanced Woven Fabrics

Standard fabric width: 1250 mm.
Resin compatibility: EP/VE.
Custom width range: 300—1600 mm

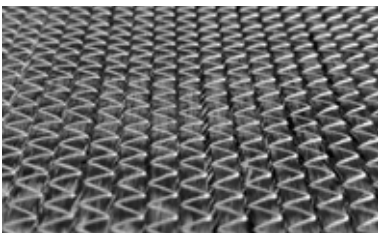
product	areal weight	weave pattern	thread material
ACM C160T/P	160 g/m ²	twill 2/2; plain	3K
ACM C200T/P	200 g/m ²	twill 2/2; plain	3K
ACM C240T/P	240 g/m ²	twill 2/2; plain	3K
ACM C270T/P	270 g/m ²	twill 2/2; plain	3K
ACM C300T/P	300 g/m ²	twill 2/2; plain	3K
ACM C400T/P	400 g/m ²	twill 2/2; plain	12K
ACM C450T/P	450 g/m ²	twill 2/2; plain	12K
ACM C600T/P	600 g/m ²	twill 2/2; plain	12K
ACM C800T/P	800 g/m ²	twill 2/2; plain	24K



Unidirectional Woven Fabrics

Standard fabric width: 300 mm.
Resin compatibility: EP/VE.
Custom width range: 120—1600 mm.

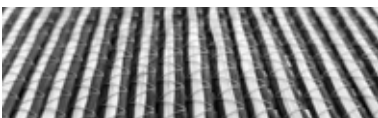
product	areal weight	weave pattern	warp/weft (yarns/cm)	thread material
ACM C130P	130 g/m ²	plain	1.5 × 1.0	12K
ACM C200P	200 g/m ²	plain	2.4 × 1.0	12K
ACM C300P	300 g/m ²	plain	3.6 × 1.0	12K
ACM C450P	450 g/m ²	plain	5.5 × 1.0	12K
ACM C530P	530 g/m ²	plain	3.2 × 1.0	24K
ACM C600P	600 g/m ²	plain	7.2 × 0.5	12K
ACM C800P	800 g/m ²	plain	2.4 × 0.5	50K
ACM C800P	800 g/m ²	plain	9.6 × 0.5	12K



Multiaxial Carbon Fabrics

Standard fabric width: 1270 mm.
Resin compatibility: EP/VE.

product	areal weight	fabric construction	material weight in layers
ACM C300B	300 g/m ²	0°/90°	12K, 150 g/m ²
ACM C300X	300 g/m ²	+45°/-45°	12K, 150 g/m ²
ACM C400B	400 g/m ²	0°/90°	12K, 200 g/m ²
ACM C400X	400 g/m ²	+45°/-45°	12K, 200 g/m ²
ACM C600B	600 g/m ²	0°/90°	12K, 300 g/m ²
ACM C600X	600 g/m ²	+45°/-45°	24K, 300 g/m ²
ACM C600Y	600 g/m ²	0°/+45°/-45°	12K, 200 g/m ²
ACM C800Q	800 g/m ²	0°/+45°/90°/-45°	12K, 200 g/m ²



Multiaxial Hybrid Fabrics

Standard fabric width: 1270 mm.
Resin compatibility: EP/VE.

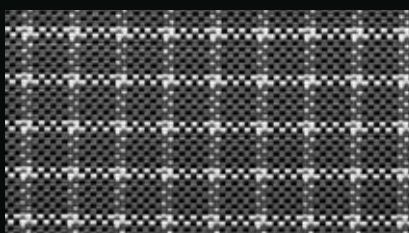
product	areal weight	fabric construction	thread material
ACM CG600B	600 g/m ²	0°/90°	40% CF 12K 60% E-Glass
ACM CG600X	600 g/m ²	+45°/-45°	
ACM CG790B	800 g/m ²	0°/90°	
ACM CG790X	800 g/m ²	+45°/-45°	

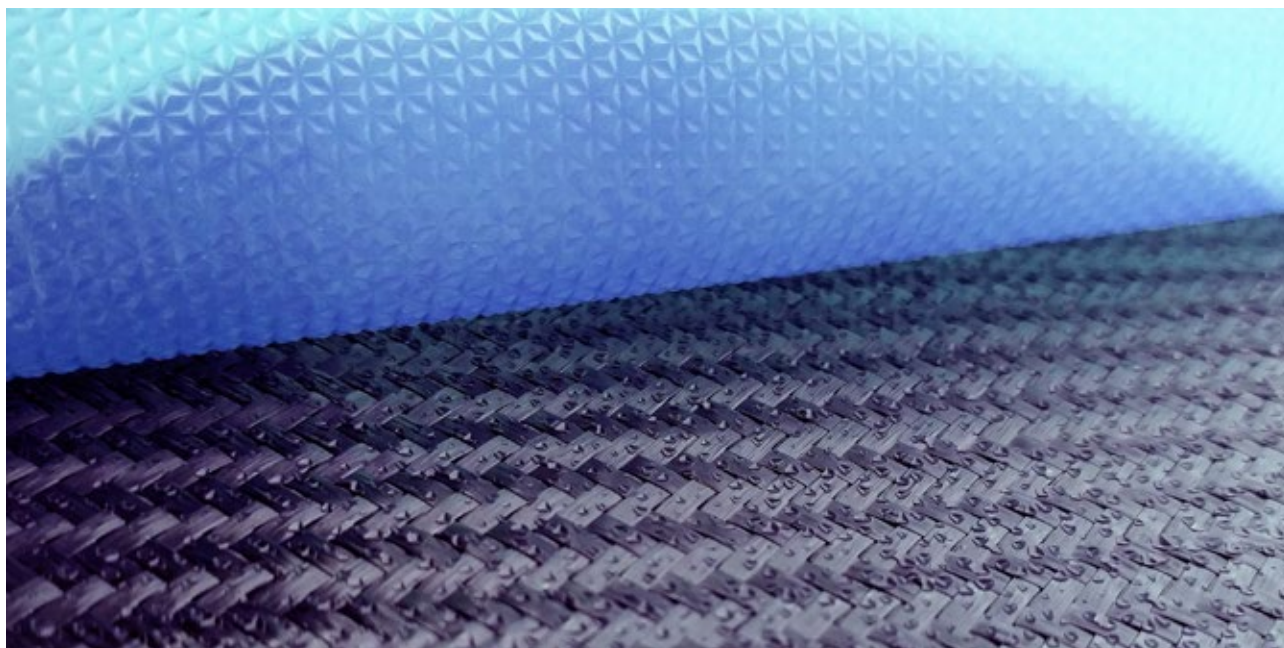
* Custom width, orientation and other source materials available on request.



AESTHETIC FABRICS

Aesthetic Fabrics are used on the surface (top layer) of a composite structure where the visual appearance of the composite (fabric) is important. This catalogue has been created to introduce different non-standard woven patterns and to show the freedom of fabric design based on carbon fiber. All of these patterns can be manufactured by UMATEX. For these patterns mainly 3K carbon fiber can be used. For hybrid materials, various glass, aramid (yellow and red) and other materials, such as polyester can be used.





PREPREGS

UMATEX prepregs — are intermediate composite materials. Prepregs are obtained by impregnation of reinforcing fibrous base with evenly distributed polymer resin systems. Impregnation method used ensures achieving maximum physical and chemical properties of reinforcing material. Fibre impregnation improves material quality by 30%.

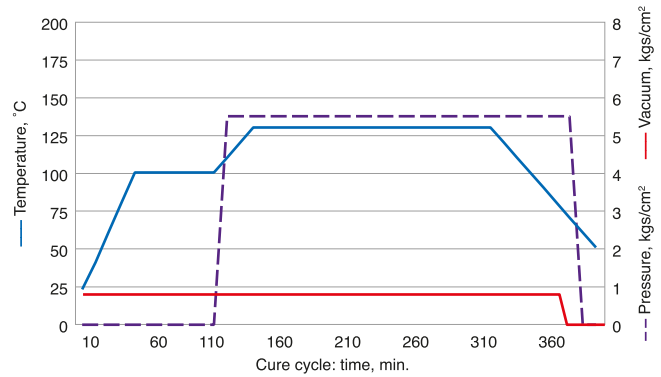
Plastics Properties	Standard	t, °C	ACM102-C200UD	ACM102-C200T	ACM1412-C200UD	ACM1412-C200T	ACM1208-C370T	ACM1218-C200T
Tensile strength, MPa, 0°	ASTM D3039	23	2200	1010	2350	950	1015	790
Tensile modulus, GPa, 0°			150	68	155	85	61	58
Compression strength, MPa, 0°	ASTM D6641	23	935	785	1300	780	615	540
Compression modules, GPa, 0°			125	69	135	72	61	55
Interlaminar shear strength, MPa, 0°	ISO 14130	23	104	77	120	81	63	60

Pesin System Properties	Standard	ACM-102	ACM-1412	ACM-1208	ACM-1216	ACM-1218
Curing temperature, °C	—	130	180	120	130	130–150
Operating temperature, up to, °C	—	100	120 (short-time exposure: up to 150)	90	70	70
Gel time, °C / time, min.	DIN 16945	110 / (60–120)	160 / (35–50)	120 / (5–12)	100 / (15–25)	100 / (12–14)
Tg dry (DMA 5°/min), °C, minimum	ASTM D 7028-07 (2015)	145	180	120	130	130
Tg wet (DMA, 5°/min) °C, minimum	ASTM D 7028-07 (2015)	115	155	—	—	—
Density (cured), g/cm ³	ASTM D 792-13	1.20–1.22	1.21–1.23	1.19–1.21	1.19–1.21	1.19–1.21
Pot life at room t, minimum, days	—	45	30	30	30	30

ACM-102

Hot-melt epoxy resin system for structural applications. It is designed to be used in the production of polymer composites with a low energy cure cycle.

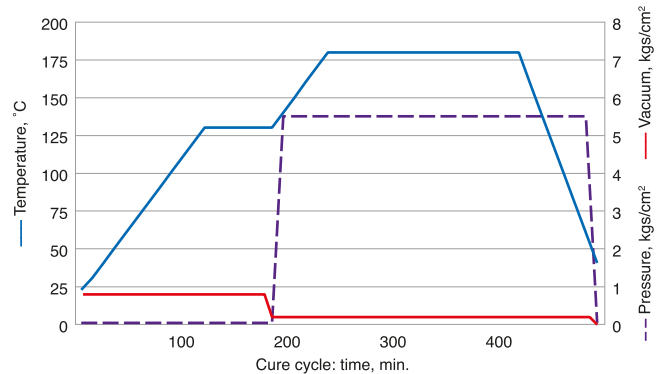
- Good for autoclave and vacuum moulding
- Good for automated lay-up



ACM-1412

Hot-melt epoxy resin system for structural applications. It is designed for polymer composites to be used in fluctuating load and high temperature conditions.

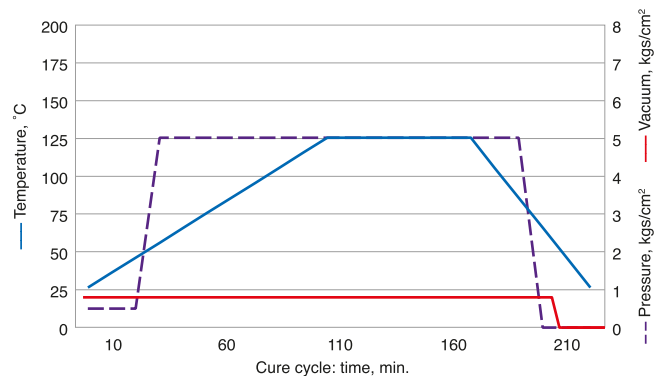
- Good for autoclave moulding
- Good for automated lay-up



ACM-1208

Hot-melt epoxy resin system for industrial applications. Having excellent processability, it is specially developed for the production of polymer composites with high-quality surface.

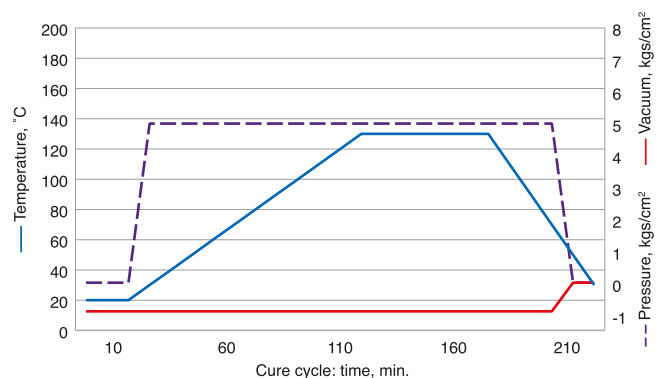
- Good for autoclave and vacuum moulding
- Adhesive and draping effects suitable to lay up large items
- UV resistance



ACM-1216

Hot-melt epoxy resin system with accelerated cure cycle. It is specially developed for the production of sports gear from polymer composites that withstand high dynamic loads at temperatures below zero.

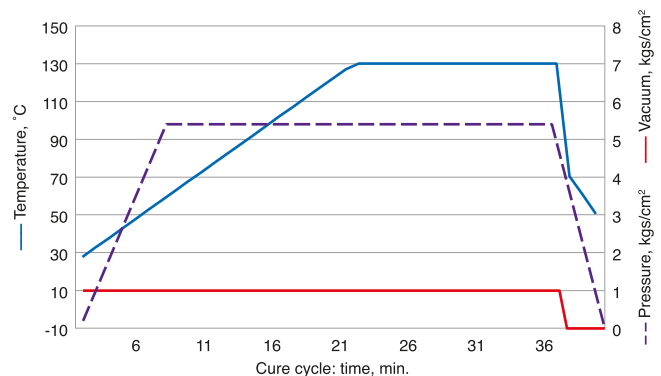
- Good for autoclave and press moulding



ACM-1218

Hot-melt epoxy resin system for industrial applications. The product has a fast cure cycle.

- Good for pressing as well as autoclave and vacuum moulding
- Adhesive and draping effects suitable to lay up large items



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