

## Technical data sheet

### ARMATON multiaxial fabrics

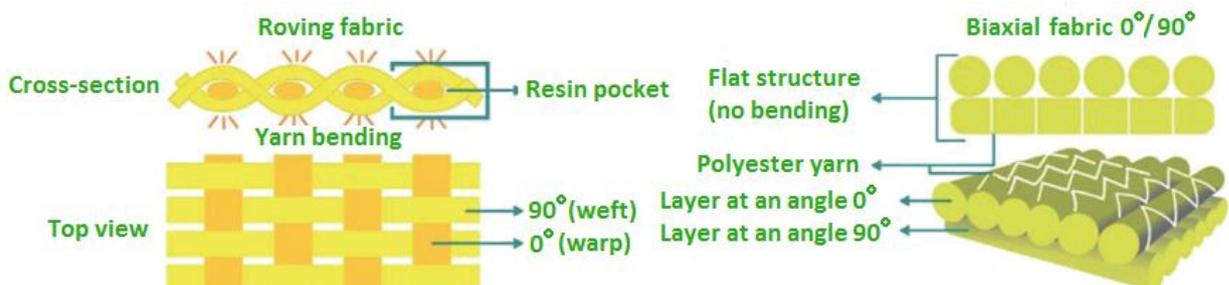
Reinforcement of construction materials



**ARMATON multiaxial fabric** is a textile material consisting of one or more layers of glass fibers. The layers are oriented in various directions and stitched with a polyester yarn. ARMATON multiaxial fabrics are manufactured using state-of-the-art equipment from Germany, which guarantees output of high-quality products.

**Typical application:** ARMATON multiaxial fabrics are used as a reinforcing filler for making high-endurance materials out of fiberglass reinforced plastics (FRP). The FRP based on multiaxial fabrics are successfully applied in the following industries:

- ✓ wind energy (blades, aerodynamic tunnel of wind power generators)
- ✓ aircraft (fuselages of planes and helicopters, main and anti-torque rotors of helicopters, wings, aerodynamic fairing, passenger seats)
- ✓ space (aerials, paraboloidal mirrors, autoclaves)
- ✓ marine (hulls)
- ✓ automotive (non-load bearing parts of a car body, refrigerated containers)
- ✓ railway (bodies of rail and subway cars, aerodynamic fairings, load-bearing parts of interior furnishing)
- ✓ building (reinforcement of concrete structures, window and door profiles, tents, bridges)
- ✓ tubes and vessels for storage and transportation of deleterious substances
- ✓ sports gear (tennis rackets, skis, surfs boards and snowboards, boats, bicycle frames, ice hockey sticks and helmets)
- ✓ medicine (medical devices)



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### Physical and mechanical properties

Property	Unit	ARMATON 350286	ARMATON 450272	ARMATON 450271	ARMATON 650212	ARMATON 600285
Orientation of fibers, layer-by-layer	degree (angle)	+45°/-45°	+80°/-80°	+45°/-45°	+45°/-45°	+45°/-45°
Surface weight	g/m <sup>2</sup> , ±15%	350	450	450	650	600
Distribution of surface weight, layer-by-layer	%	50/50	50/50	50/50	50/50	50/50
Tensile strength, layer-by-layer**	N/5cm, not less than	4000/ 4000	4100/ 4100	4100/ 4100	6600/ 6600	7800/ 7800
Thickness at a pressure of 5kPa	mm, ±15%	0.69	0.45	0.50	0.68	0.65
<b>Standard roll size</b>						
width (without fringe)	cm	125±1	125±1	123±1	125±1	125±1
length	m	≥50				

Property	Unit	ARMATON 600280	ARMATON 700316	ARMATON 750493	ARMATON 770294*	ARMATON 800287
Orientation of fibers, layer-by-layer	degree (angle)	0°/90°	0°/+45°/ -45°	0°/+45°/ 90°/-45°	+45°/-45°	+45°/-45°
Surface weight	g/m <sup>2</sup> , ±15%	600	700	750	770	800
Distribution of surface weight, layer-by-layer	%	80/20	33/33/33	25/25/25/25	50/50	50/50
Tensile strength, layer-by-layer**	N/5cm, not less than	11760/ 2744	4700 /4200 /4200	3400 /3500/ 3400 /3500	4100/4100	8700/8700
Thickness at a pressure of 5kPa	mm, ±15%	0.69	0.75	0.70	0.77	0.88
<b>Standard roll size</b>						
width (without fringe)	cm	125±1	125±1	125±1	123±1	125±1
length	m	≥50				

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Property	Unit	ARMATON 950329	ARMATON 1450374	ARMATON 1200492	ARMATON 800486
Orientation of fibers, layer-by-layer	degree (angle)	0°/+45°/-45°	0°/+45°/-45°	0°/+45°/ 90° /-45°	0°/+45°/ 90° /-45°
Surface weight	g/m <sup>2</sup> , ±15%	950	1450	1250	800
Distribution of surface weight, layer-by-layer	%	50/25/25	33/33/33	25/25/25/25	25/25/25/25
Tensile strength, layer-by-layer**	N/5cm, not less than	9300/4700/4700	9300/9900/9900	6200/6600/6600/6600	4200/4100/2300/4100
Thickness at a pressure of 5kPa	mm, ±15%	0.82	1.15	1.21	0.71
<b>Standard roll size</b>					
width (without fringe)	cm	125±1	124±1	125±1	125±1
length	m	≥50			

*\*The fabrics contains a layer of chop strand mat, \*\*The tensile strength property, layer-by-layer is referential*

*Manufacture of the material with other physical and mechanical properties is accepted upon agreeing about with a consumer.*



- ✓ Maximum width of sheeting is 1.27 m
- ✓ 10 cm bands and wider are possible
- ✓ Strands are normally oriented in 0°, 90°, +45°, -45° directions. Change in orientation angle from +20° to +90° and from -20° to -90° is possible
- ✓ Plying with a nonwoven fabric or chopped fiber for better adhesion inside composite or for finishing of surface are possible
- ✓ Depending on type and length of a stitch of stitching yarn, manufacture of fabric with various extent of drapability is possible
- ✓ System of sizing agents is meant for achieving excellent adhesion with polyester, epoxy and phenol resins (a general-purpose sizing agent, silane, is used)
- ✓ The fabric can be manufactured out of various types of glass and basalt or combination thereof.

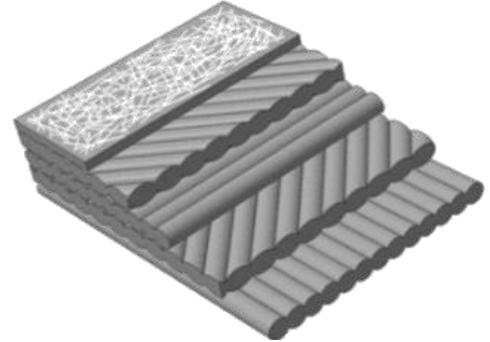
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Depending on number of layers, the following fabrics are manufactured:

- One-layered /monoaxial ( $0^\circ/90^\circ$ )
- Two-layered / biaxial ( $0^\circ/90^\circ$ ), ( $+45^\circ/-45^\circ$ )
- Three-layered / triaxial ( $0^\circ/+45^\circ/-45^\circ$ )
- Four-layered / quadri-axial ( $0^\circ/+45^\circ/90^\circ/-45^\circ$ )



**Advantages:** glass-fiber multiaxial fabrics are non-inflammable, non-toxic. Compared to woven roving glass fabrics, multiaxial fabrics ensure:

- ✓ high strength properties in terms of tension, bend, torsion
- ✓ impact resistance
- ✓ quick and high-quality impregnation with binding agent
- ✓ reduction in quantity of fabric during laying and optimization of composites manufacturing process
- ✓ high workability
- ✓ possible reinforcement of composite materials in different directions
- ✓ reduction in consumption of resin to 20-30%: owing to non-interwoven yarns, strands are laid denser as compared to roving fabrics, thus resulting in lower resistance to flow of a binding agent
- ✓ final weight may be reduced to 50%
- ✓ mechanical strength may be increased twice (twice mechanical strength of roving fabrics with comparable surface weight)
- ✓ strict adherence to assigned reinforcement design
- ✓ absence of nodes on surface of product.

#### Regulatory documents:

- STO 00205009-004-2016

#### Manufactured by:

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