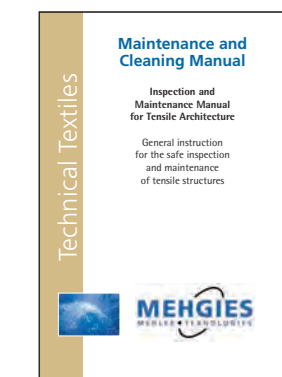




Low & Bonar is a reliable partner for tensile architecture applications. With over 60 years experience in the coating industry we can offer our customers unbeatable support in this field of application.



Mehgies TensileDraw is an AutoCAD® and RHINO® fully compatible and integrated plug-in software package for integrated 3D model design.



Our detailed inspection and maintenance manual for tensile architecture enables us to support our customers in maintaining the material's initial aesthetic characteristics.

A dedicated guideline on tensile architecture application, written in cooperation with the IMS institute of Germany, with many interesting information about material properties, design, manufacture and installation tasks.



Low & Bonar takes their contribution to a sustainable future seriously. Improving the sustainability of our products starts with 'state-of-the-art' manufacturing facilities and careful selection of raw materials combined with practical and sustainable recycling systems.



Low & Bonar strictly selects all product components in conjunction with the most stringent EU directives and is fulfilling them as a pioneer in this industry.

We are participating in VinylPlus. This is a voluntary commitment by the PVC industry and covers the entire lifecycle of PVC and PVC products. It represents for Low & Bonar a set of guidelines for acting in a sustainable manner.



MEHGIES® fabrics are readily traceable and therefore able to be 100% recycled. Recycling should be a user-friendly task and easily accessible everywhere. In addition to in-house recycling processes, Low & Bonar participates in the European EPCoat recycling system, supported and certified by the VinylPlus association.



We collaborate with the German IBU (Institute for environment and construction) and participate in the European EPD program, which defines the ecological standards for construction materials with the new EN15804. Life Cycle Analysis and Environmental Product Declaration for Mehgies architectural fabrics are available on request.

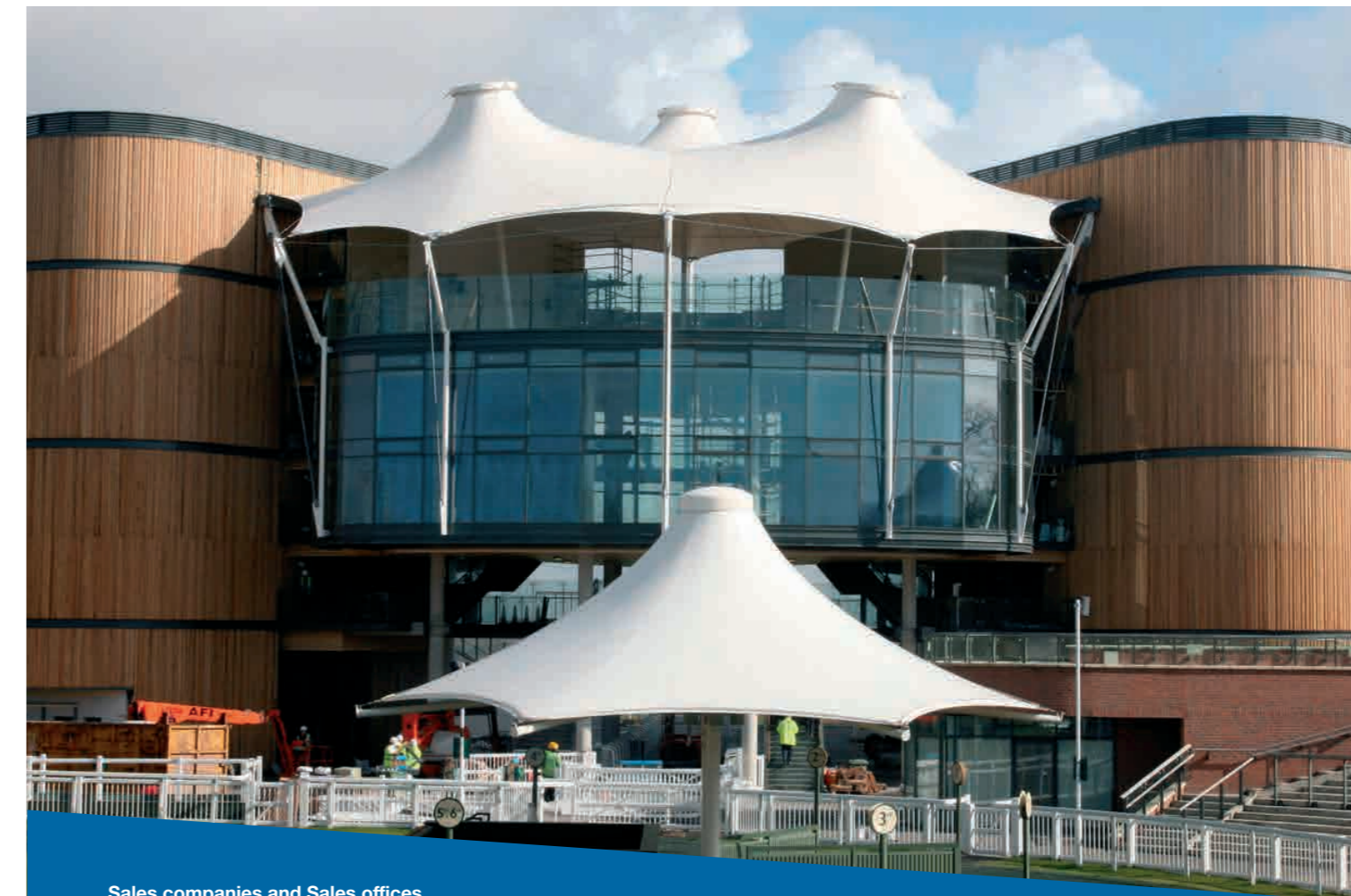


VALMEX® Product No. FR 700 Type I 7205 FR 900 Type II 7211 FR 1000 Type III 7269 FR 1400 Type IV 7270 FR 1600 Type V 7274

Measurement methods/ Classifications	Unit	FR 700 Type I 7205	FR 900 Type II 7211	FR 1000 Type III 7269	FR 1400 Type IV 7270	FR 1600 Type V 7274
Material composition						
Finish		Multi-composed top coating (lacquering with Titaniumdioxide (TiO ₂) reinforcement and highly concentrated PVDF mixture on both sides, weldable without grinding)				
Base fabric	DIN ISO 2076	Polyester Plain Weave L1/1	Polyester Panama Weave P 2/2	Polyester Panama Weave P 2/2	Polyester Panama Weave P 3/3	Polyester Panama Weave P 3/4
Yarn count	DIN ISO 2060	dtex	1100	1100	1670	1670
Low-wick yarn treatment	Methyleneblue liquid method	mm	< 5	< 5	< 5	< 5
Total weight	EN ISO 2286-2	g/m ²	700	900	1050	1350
Fabric thickness		mm	0.6	0.8	0.9	1.1
CMD ratio (Front/Back)			3:2	3:2	3:2	3:2
Mechanical properties						
Tensile strength (warp/weft)	DIN EN ISO 1421/N1	N/50 mm	3000 / 3000	4300 / 4200	6000 / 5500	8000 / 7000
Elongation at break (warp/weft)	DIN EN ISO 1421/N1	%	22 / 30	23 / 29	24 / 32	24 / 33
Tear strength (warp/weft)	DIN 53363	N	300 / 300	500 / 500	900 / 800	1200 / 1200
Adhesion	PA 09.03	N/cm	20	25	25	26
Crack resistance	DIN 53359 A	No. of folding	100,000 T - no cracks	100,000 T - no cracks	100,000 T - no cracks	100,000 T - no cracks
Physical properties						
Light fastness	DIN EN ISO 105 B02		> 6	> 6	> 6	> 6
White index	CIE		≥ 90	≥ 90	≥ 90	≥ 90
Solar transmission	ASHRAE 74 1988 / ISO EN 410	%	9 / 9	7 / 7	6 / 6	5 / 5
Solar reflection	ASHRAE 74 1988 / ISO EN 410	%	83 / 81	85 / 82	84 / 82	86 / 84
Solar absorption	ASHRAE 74 1988 / ISO EN 410	%	8 / 10	8 / 11	10 / 12	9 / 11
UV transmission	DIN EN 410	%	0	0	0	0
Shading coefficient Fc, single glazing (external/internal)	DIN EN 13363-1		0.12 / 0.30	0.10 / 0.28	0.10 / 0.27	0.08 / 0.26
Solar reflectance index (SRI)	ASTM E 1980-01		114	113	112	113
Global thermal resistivity, R-value (vertical/horizontal)	DIN EN ISO 6946	[m ² K/W]	0.175 / 0.206	0.176 / 0.207	0.177 / 0.208	0.178 / 0.209
Global thermal conductivity, U-value, (vertical/horizontal)	DIN EN ISO 6946	[W/m ² K]	5.711 / 4.852	5.677 / 4.827	5.658 / 4.813	5.617 / 4.783
Cold resistance	DIN EN 1876-1	°C	-40	-40	-40	-40
Heat resistance	PA 07.04	°C	+70	+70	+70	+70
Fire resistance	Classification		DIN 4102-1:B1 EN 13501-1:B S2 DC UNI 9177-CL2 NFP 92507-M2 BS 7837 California T19 SIS 650082 NFPA 701 Method 2 GOST	DIN 4102-1:B1 EN 13501-1:B S2 DC UNI 9177-CL2 NFP 92507-M2 BS 7837 California T19 CAN UL C109	DIN 4102-1:B1 EN 13501-1:B S2 DO UNI 9177-CL2	DIN 4102-1:B1 EN 13501-1:B S2 DO UNI 9177-CL2
Standard roll width	cm		250 on request; 300 cm			
Warranty			15 years			
Quality and environment			All MEHATOP range product have been submitted to a Life Cycle Analysis, results are available on request. All products comply with European REACH directives and we are ISO 9001 certified. All MEHATOP range products are 100% recyclable through the EPCoat system, information is available on request.			

Solartechnical data/ CIE white index measurements are based on colour 958

These indicated technical data are based on average results. Due to production procedures slight deviations can occur. All technical data are in accordance with the present standard of knowledge and give product information without legal binding. All data apply to new products. All values are generated according to standards at established laboratories. Results may vary if executed at different laboratories or due to different standard interpretations. Applications suggested here do not release the customer from testing material for its intended application.



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VALMEX® MEHATOP® F1
HIGH-VALUE TEXTILES FOR PERMANENT STRUCTURES

Innovation · Performance · Sustainability



MEHGIES® VALMEX®

MEHATOP® F1 TiO₂ lacquered

700 g/m²



VALMEX® FR 700 MEHATOP F1, Type I

900 g/m²



VALMEX® FR 900 MEHATOP F1, Type II

1050 g/m²



VALMEX® FR 1000 MEHATOP F1, Type III

1350 g/m²



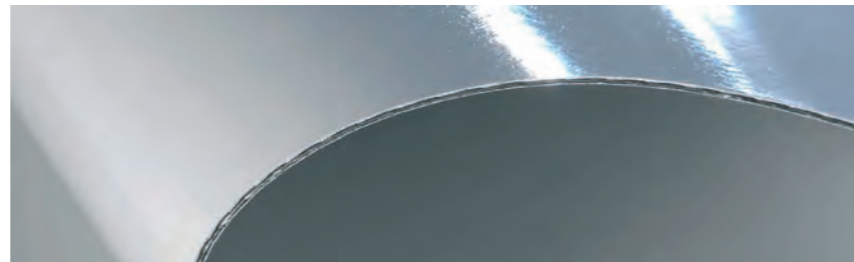
VALMEX® FR 1400 MEHATOP F1, Type IV

1550 g/m²



VALMEX® FR 1600 MEHATOP F1, Type V

Manufacturing of colours and metallic lacquers upon request



Opaque version for no light transmission



HTL (high translucency) version for maximum light transmission

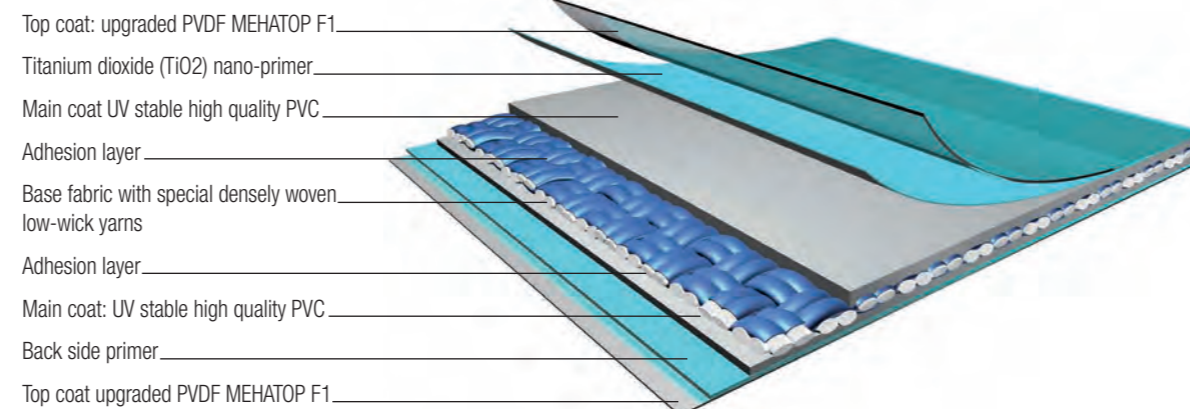
MEHGIES® VALMEX® membranes with implemented **MEHATOP F1** top coat lacquering system is a multi-layer composite material with special densely woven low-wick yarns in the base fabric.

The surface lacquering has been implemented with a new blend of highly concentrated polyvinylidene fluoride, developed by Low & Bonar, and reinforced with an 'in-house' developed protection layer of 'titanium

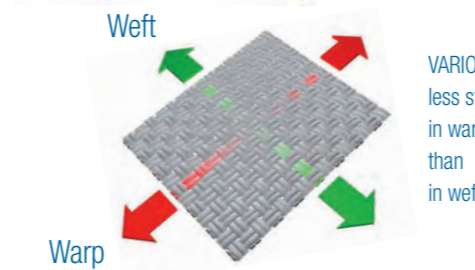
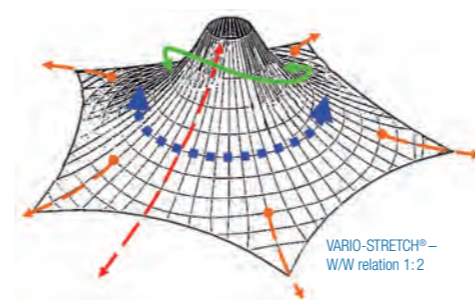
dioxide (TiO₂) nano-primer'. This further increases the double-top coat performance, enhancing the protection and aesthetic effect, while remaining perfectly weldable by high-frequency and hot air.

This coating system is available as standard on all MEHGIES® VALMEX® structure coated technical textiles and also on specialities.

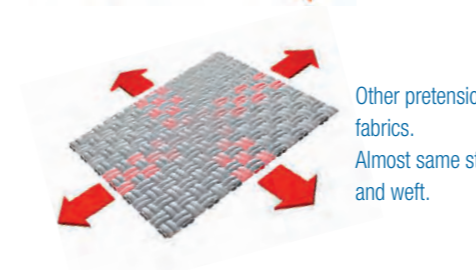
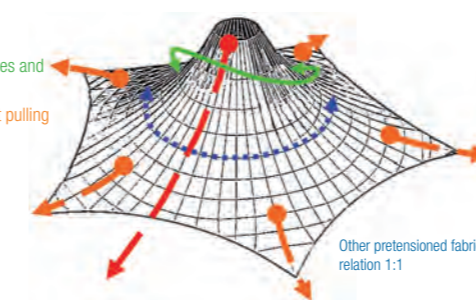
A schematic view of the multilayered material composition:



MEHGIES® VALMEX® membranes are woven exclusively from high tenacity and pre-treated low-wick yarns. The fabric, thanks to outstanding constant mechanical behavior, ensures longstanding maintenance-free and reliable performances.



Engineered pretension with higher anisotropic stress-strain relationship to facilitate the distensile process – the **VARIO-STRETCH®** solution in comparison with other pretensioned fabrics:



In comparison to other pre-stressed fabrics, **VARIO-STRETCH®** greatly reduces the tensional loads at pre-tension stage in all directions, so that during execution the fabric can be stretched homogeneously. Extra elongation

in the weft enables the orthogonal forces to be distributed more evenly and also reduces the lateral load peak at the pulling points.

Statements from practitioners:

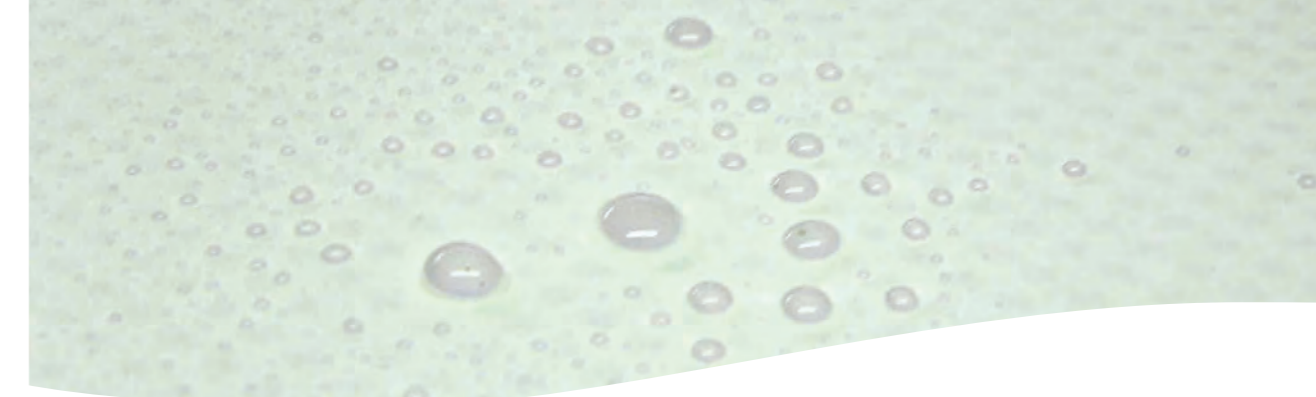
"In a general assumption, different stretching properties in the warp and weft direction seem to be a disadvantage at first look. The supposition at design stage is that the surface composition should have an isotropic comparable conceptual model, which can be derived from the application of more rigid construction materials. In most cases, membrane fields are different in their length and width. Therefore the pattern can be tailored and oriented in a way that the larger strain of the fabric takes the shorter length and the other way around.

This method greatly facilitates the assembly, as the ways of spanning are nearly the same, making it easier to reach a so-called 'geometrically similar tensioning'. In any case the intension is to finally get the same geometry (same crimp) of the fabric threads in both directions. The conclusion that only the use of similar strain properties in warp and weft constitute a material-technical optimum in membrane structures by my long experience in practice cannot be justified." Prof. em. Dr.-Ing. Ewald Bubner

"At the design stage, the installation for textile architecture is in many cases underestimated in terms of time, costs and complexity. The elongation behavior of an engineered warp/weft balanced anisotropic fabric may greatly help to reduce the installation loads at pre-stress phase, leading to considerable time and cost savings on site. Instead of this, an isotropic balanced fabric will necessarily lead to implemented efforts during the material outstretching phase." Stephan Lenk, Managing Director Montageservice LB GmbH



Inconvenience of isotropic oriented fabrics: 1,000kg each pulling tools in closer row in action, during pre-stress phase.



MEHGIES® VALMEX®

MEHATOP® F1 TiO₂ lacquered

Lacquered sample

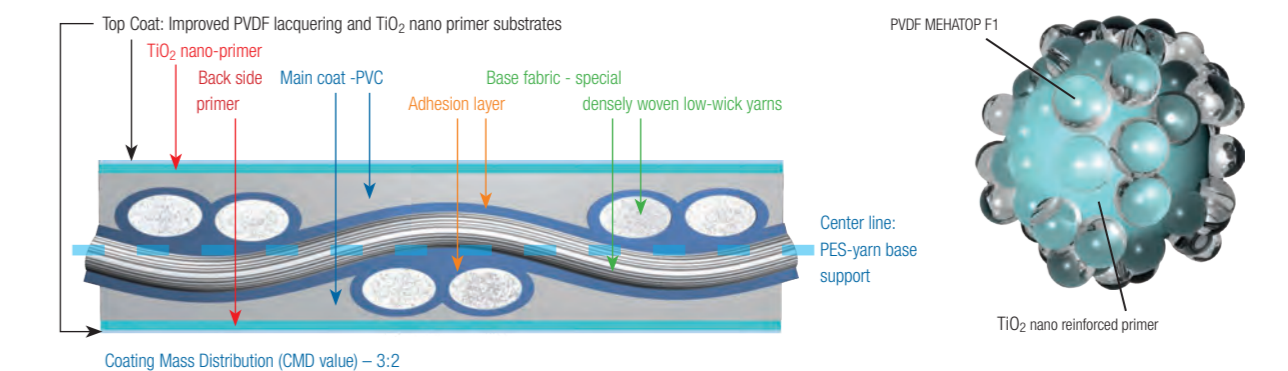
Unlacquered sample

Base fabric sample

MEHGIES® VALMEX® with implemented **MEHATOP F1** top coat lacquering system and titanium dioxide (TiO₂) nano-primer are engineered to perform functionally.

The weldable multi-layered coating compound ensures outstanding aesthetic and durable performances.

Schematic view of a MEHGIES® MEHATOP F1 membrane with TiO₂ nano-primer – section view:

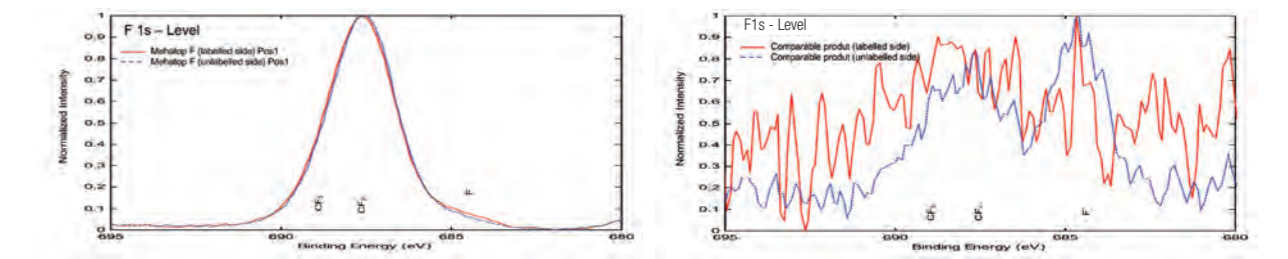


A top coat lacquering performs at its best, if:

- The fluorine content and its constant homogeneity exceeds the one of a standard acrylic/pvdf mixed lacquer
- The lacquer component is as thin as possible to remain flexible and bonded to other components
- The primer prevents delamination and protects the PVC top coat from discoloration and migration

Comparison between MEHGIES® VALMEX® MEHATOP F1 and one of similar high end quality products.

Spectral test of binding energy level and fluorine content:



Elemental concentration (at %)	
MEHGIES® VALMEX® MEHATOP F1	
front side	14.4
back side	13.1
Comparable product	
front side	0.4
back side	0.1

VALMEX® with **MEHATOP F1** is a 'state-of-the-art' implementation of those characteristics ensuring perfect workability and component stability under all conditions at the same time.