

VALMEX[®] structure

Engineered fabrics for extraordinary tensile architecture structures

Improved PVDF TopCoat

MEHATOP F1[®] 

TiO₂ Nano-titanium reinforced



MEHLER
TECHNOLOGIES



Improved PVDF TopCoat
VALMEX® MEHATOP F1®
TiO₂ Nano-titanium reinforced

both sides PVDF lacquer

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



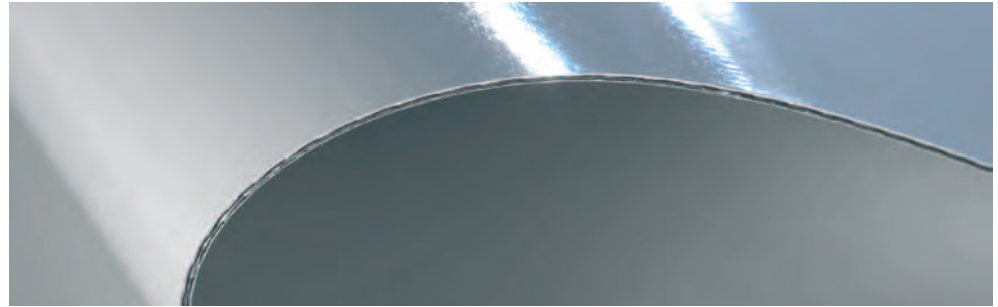
VALMEX® FR 1400 MEHATOP F1, Type IV

1550 g/m²



VALMEX® FR 1600 MEHATOP F1, Type V

Manufacturing of colours and metallic lacquers upon request



Opaque finishing for no light transmission



HTL (high translucency) finishing for maximum light transmission

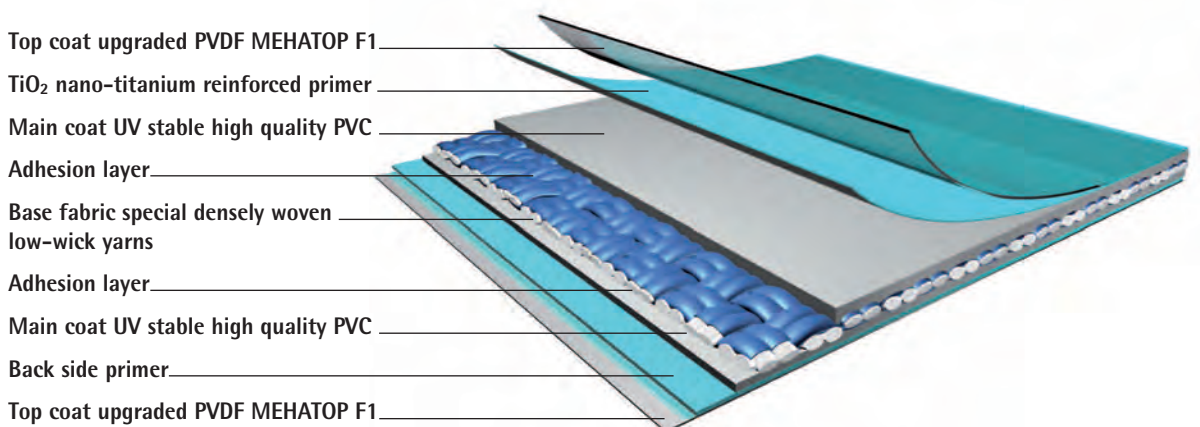
Mehler Technologies **VALMEX®** membranes with implemented **MEHATOP F1** top coat lacquering system is a multi-layer composite material with special densely woven low-wick yarns in the base fabric.

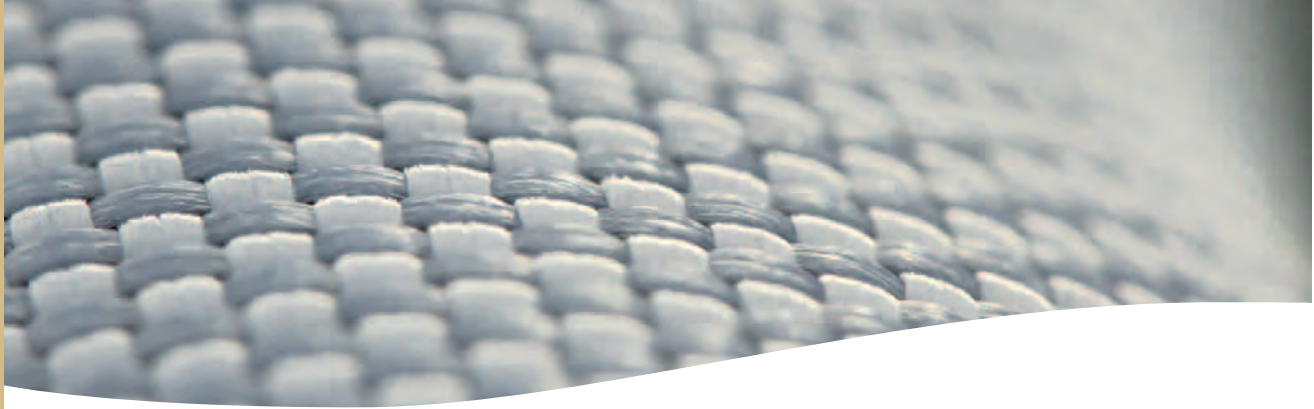
The surface lacquering has been implemented with a new blend of highly concentrated Polyvinylidene fluoride, developed by Mehler Technologies, and reinforced with an 'in-house' developed protection layer of 'nano titanium

dioxide TiO₂ 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 **VALMEX® structure** technical textiles and also on specialties.

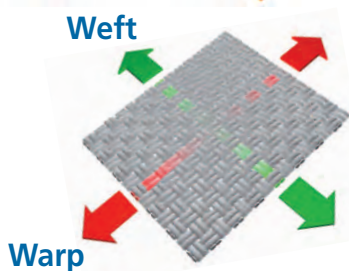
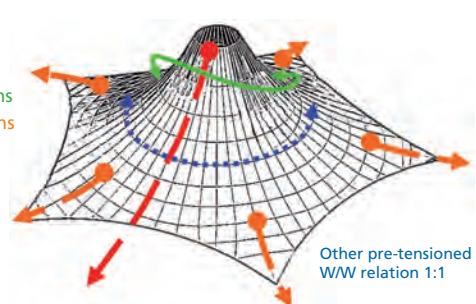
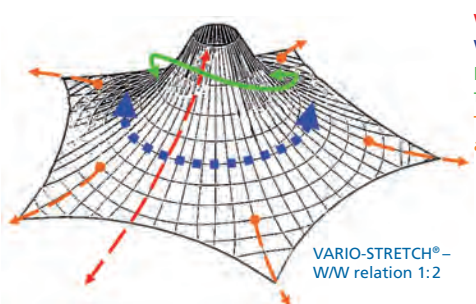
A schematic view of the multilayered material composition:



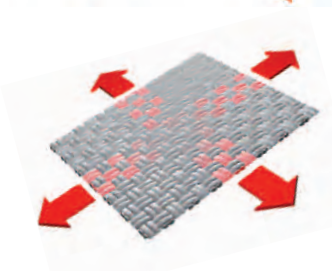


Mehler Technologies **VALMEX®** membranes are woven exclusively from high tenacity and pre-treated low-wick yarns. The fabric, thanks to outstanding constant mechanical behavior, ensures longstanding maintenance-free and reliable performances.

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



VARIO-STRETCH®:
less stretch
in warp direction
than
in weft direction



Other pre-tensioned fabrics.
Almost same stretch
in warp and weft.

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

homogenously. 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 intention 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."

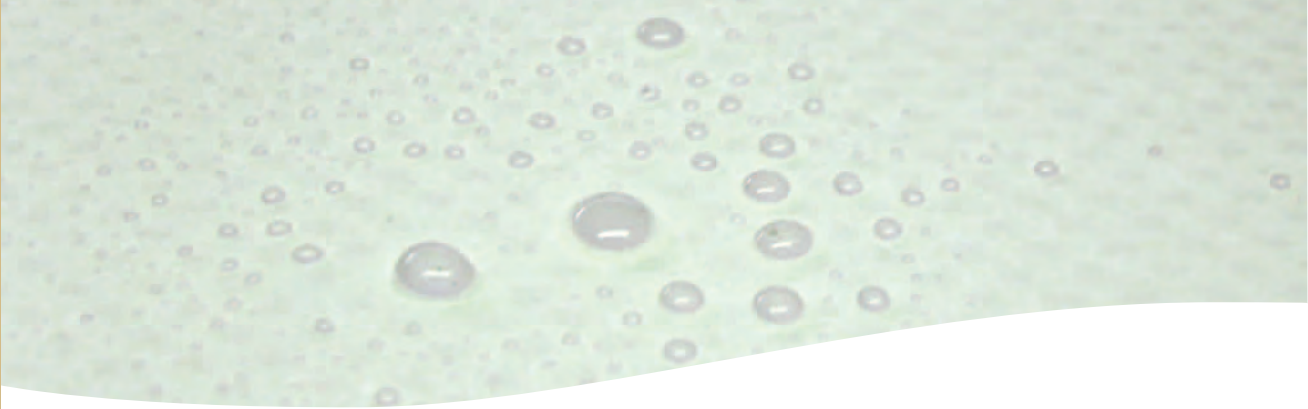
Prof. em. Dr.-Ing. Ewald Bubner

"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 prestress 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



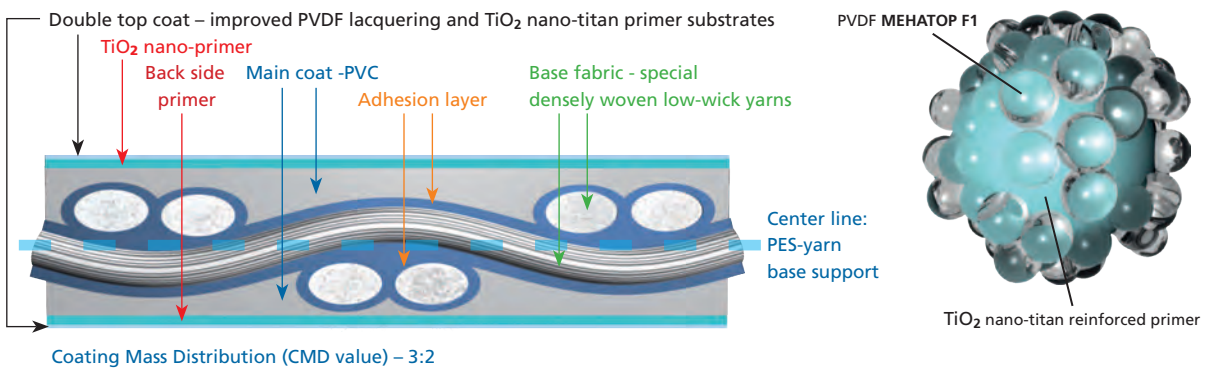
Inconvenience of isotropic oriented fabrics:
1,000kg each pulling tools in closer row in action, during prestress phase.



Mehler Technologies VALMEX® with implemented MEHATOP F1 top coat lacquering system and TiO₂ nano-titanium reinforced primer are engineered to perform functionally.

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

Schematic view of a Mehler Technologies MEHATOP F1 membrane with TiO₂ nano-primer – section view:

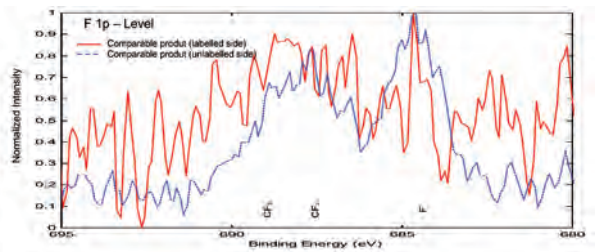
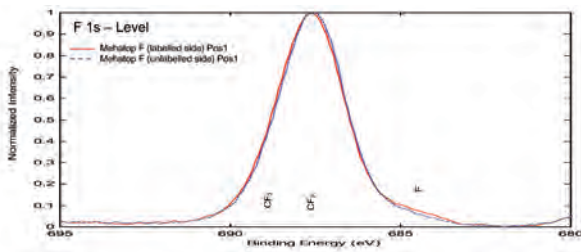


A top coat lacquering performs at its best, if:

- The content of fluorine is higher, homogeneous and constant than 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 discolouration and migration

Comparison between Mehler Technologies MEHATOP F1 and one of similar high end quality products.

Spectral test of binding energy level and fluorine content:



Elemental concentration (at %) Fluoride content

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.

Lacquered sample

Unlacquered sample

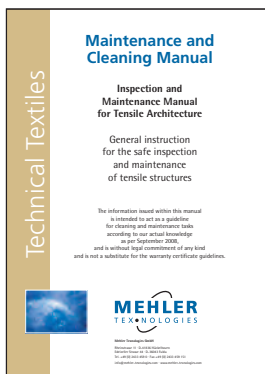
Base fabric sample

Mehler Technologies 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.

MEHLER *tensiledraw*

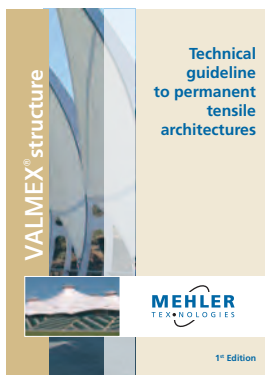


Mehler TensileDraw is an AutoCAD® and RHINO® fully compatible and integrated plug-in software package for integrated 3D model design.



Our detailed inspection and maintenance manual for tensile architecture enables us to support our customers in maintaining the materials 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.



Mehler Technologies take seriously their contribution to a sustainable future. 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.



Registration, Evaluation and Authorisation of Chemicals

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

Mehler Technologies are participating in VinlyPlus. This is a voluntary commitment by the PVC industry and covers the entire lifecycle of PVC and PVC products. It represents for Mehler Technologies a set of guidelines for acting in a sustainable manner.



Mehler Technologies 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, Mehler Technologies participate in the European EPCoat recycling system, supported and certified by the VinylPlus association.

verified + traceable
LCA+EPD

Mehler Technologies collaborates with the German IBU (Institute for environment and construction) and participates 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 Mehler Technologies architectural fabrics are available on request.



Institut Bauen und Umwelt e.V.

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

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	2200
Low-wick yarn treatment	Methylenblue liquid method	mm	< 5	< 5	< 5	< 5	< 5
Total weight	EN ISO 2286-2	g/m ²	700	900	1050	1350	1550
Fabric thickness		mm	0.6	0.8	0.9	1.1	1.3
CMD ratio (Front: Back)			3:2	3:2	3:2	3:2	3:2
Mechanical properties							
Tensile strength (warp/weft)	DIN EN ISO 1421/V1	N/50 mm	3000 / 3000	4300 / 4200	6000 / 5500	8000 / 7000	10000 / 9000
Elongation at break (warp/weft)	DIN EN ISO 1421/V1	%	22 / 30	23 / 29	24 / 32	24 / 33	27 / 29
Tear strength (warp/weft)	DIN 53363	N	300 / 300	500 / 500	900 / 800	1200 / 1200	2000 / 2000
Adhesion	PA 09.03	N/cm	20	25	25	26	30
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	100,000 T - no cracks
Physical properties							
Light fastness	DIN EN ISO 105 B02		> 6	> 6	> 6	> 6	> 6
White index	CIE		≥ 90	≥ 90	≥ 90	≥ 90	≥ 90
Solar transmission	ASHRAE 74 1988 / ISO EN 410	%	9 / 9	7 / 7	6 / 6	5 / 5	3 / 3
Solar reflection	ASHRAE 74 1988 / ISO EN 410	%	83 / 81	85 / 82	84 / 82	86 / 84	86 / 84
Solar absorption	ASHRAE 74 1988 / ISO EN 410	%	8 / 10	8 / 11	10 / 12	9 / 11	11 / 13
UV transmission	DIN EN 410	%	0	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	0.06 / 0.55
Solar reflectance index (SRI)	ASTM E 1980-01		114	113	112	113	110
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	0.179 / 0.210
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	5.596 / 4.769
Cold resistance	DIN EN 1876-1	°C	-40	-40	-40	-40	-40
Heat resistance	PA 07.04	°C	+70	+70	+70	+70	+70
Fire resistance	Classification		DIN 4102-1:B1 EN 13501-1:B S2 D0 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 D0 UNI 9177:CL2 NFP 92507:M2 BS 7837 California T19 CAN ULC S109 NFPA 701 Method 2 GOST	DIN 4102-1:B1 EN 13501-1:B S2 D0 UNI 9177:CL2 UNI 9177:CL2	DIN 4102-1:B1 EN 13501-1:B S3 D0 UNI 9177:CL2	DIN 4102-1:B1 EN 13501-1:B S2 D0
Standard roll width		cm	250	250	250	250	250
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 are ISO 9001 certified. All MEHATOP range product are 100% recyclable through the EPCoat system, information are 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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