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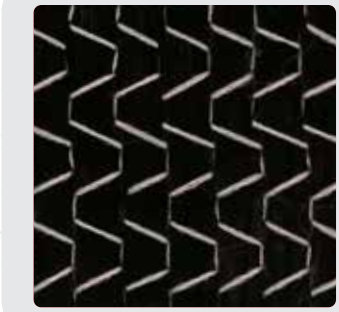
FABRICS - Carbon

CARBON MULTIAXIAL FABRICS



CARBON UNIDIRECTIONAL FABRIC

Fabric type	Unidirectional stitched non-crimp fabric
Unit Weight	200 -1200 g/m²
Type of fiber	Carbon Fiber
Direction	0 ° UD 90 0 UD
Standard Width	127 cm
Extras	Other weights and widths available upon request Available with powder binder
Certifications	DNV-GL (Standard weights noted)

CARBON BIAXIAL FABRIC

Fabric type	Biaxial stitched non-crimp fabric
Unit Weight	200 -1200 g/m²
Type of Fiber	Carbon Fiber
Direction	45°/-45° 0°/ 90°
Standard Width	127 cm
Extras	Other weights and widths available upon request Available with powder binder
Certifications	DNV-GL (Standard weights noted)

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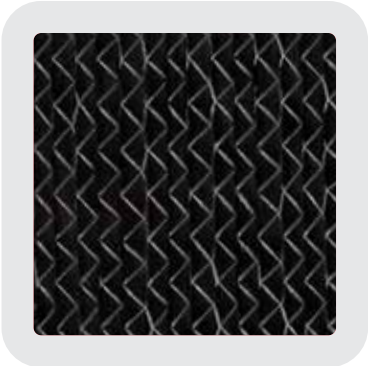
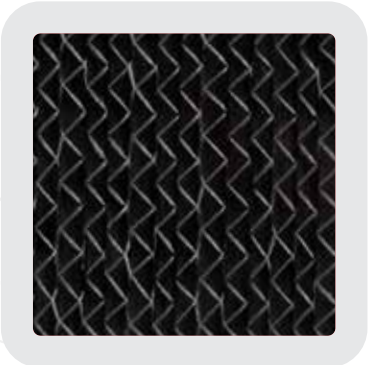
CARBON MULTIAXIAL FABRICS



CARBON TRIAXIAL FABRIC	
Fabric type	Triaxial stitched non-crimp fabric
Unit weight	300 - 2400 g/m^2
Type of fiber	Carbon Fiber
Direction	0°/45°/-45° 45°/90°/-45°
Standard width	127 cm
Extras	Other weights and widths available upon request Available with powder binder

CARBON QUADRAXIAL FABRIC	
Fabric type	Quadraxial stitched hybrid non-crip fabric
Unit weight	400 - 2400 g/m^2
Type of fiber	Carbon Fiber
Direction	0°/45°/90°/-45°
Standard width	127 cm
Extras	Other weights and widths available upon request Available with powder binder
Certifications	DNV-GL (400 - 2000 g/m^2)



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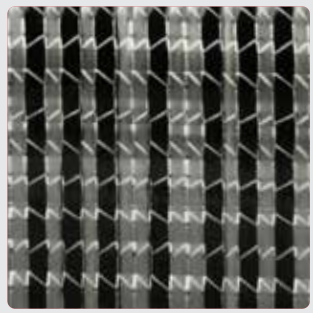
CARBON HYBRID FABRICS

CARBON GLASS HYBRID	
Fabric type	Biaxial stiched hybrid non-crimp fabric
Unit weight	200 - 2000 g/m^2
Type of fiber	Carbon Fiber & Glass Fiber
Direction	45°/-45° ; 0°/90°
standard width	127
Extras	Other weights and widths available upon request
Certifications	DNV-GL (Standard weights noted)

CARBON GLASS HYBRID	
Fabric type	Quadraxial stitched hybrid non-crip fabric
Unit weight	200 - 2400 g/m^2
Type of fiber	Carbon Fiber & Glass Fiber
Direction	0°/45°/90°/-45°
standard width	127 - 254 cm
Extras	Other weights and widths available upon request
Certifications	DNV-GL (200 - 2000 g/m^2)



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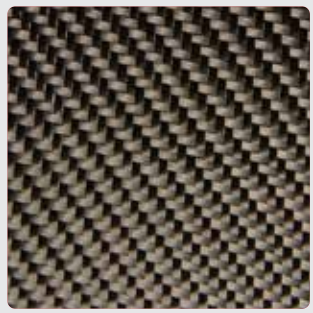
CARBON WOVEN FABRICS

UNIDIRECTIONAL CARBON WOVEN FABRIC	
Fabric type	Unidirectional Carbon Woven Fabric
Unit weight	160-1000 g/m^2
Type of fiber	Carbon Fiber
Direction	0° UD
standard width	50 - 100 cm
Extras	Other weights and widths available upon request Available with powder binder
Certifications	DNV-GL (160 - 900 g/m^2)

CARBON WOVEN FABRIC	
Fabric type	Carbon Woven Fabric
Unit weight	160-1200 g/m^2
Type of fiber	Carbon Fiber
Direction	Plain - Twill
standard width	100 - 127 cm
Extras	Other weights and widths available upon request Available with powder binder Available with web
Certifications	DNV-GL (160 - 900 g/m^2)



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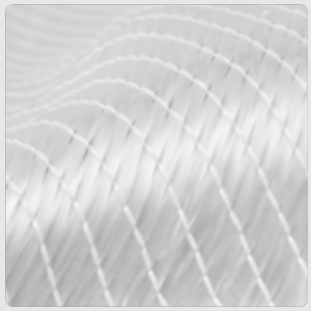
FABRICS - Glass

GLASS MULTIAXIAL FABRICS

UNIDIRECTIONAL FABRIC	
Fabric type	Unidirectional stitched non-crimp fabric
Unit weight	200 - 2000 g/m²
Type of fiber	E-glass / H-glass
Direction	0° - 90°
standard width	127 - 254 cm
Extras	Other weights and widths available upon request With and w/out CSM Veli upon request
Certifications	DNV-GL (0°; 200 - 2000 g/m²) (90°; 250 - 1900 g/m²)

BIAXIAL FABRIC	
Fabric type	Biaxial stitched non-crimp fabric
Unit weight	+45°/-45°; 200 - 2400 g/m² 0°/90°; 300 - 3780 g/m²
Type of fiber	E-glass / H-glass
Direction	45°/-45° ; 0°/90°
standard width	127 - 254 cm
Extras	Other weights and widths available upon request With and w/out CSM Veli upon request
Certifications	DNV-GL (+45/-45°; 200 - 2400 g/m²) (0°/90°; 300 - 3780 g/m²)



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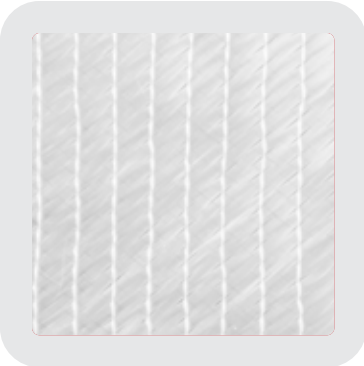
GLASS MULTIAXIAL FABRICS



TRIAXIAL FABRIC	
Fabric type	Triaxial stitched non-crimp fabric
Unit weight	0°/+45°/-45°; 360 - 2815 g/m² 45°/90°/-45°; 300 - 2225 g/m²
Type of fiber	E-glass / H-glass
Direction	0°/45°/-45° 45°/90°/-45°
standard width	127 - 254 cm
Extras	Other weights and widths Available upon request with and w/out CSM Veli upon request
Certifications	DNV-GL (0°- ±45° / 360 - 2815 g/m²) (90°- ±45° / 300 - 2225 g/m²)

QUADRAXIAL FABRIC	
Fabric type	Quadraxial stitched non-crimp fabric
Unit weight	600 - 3090 g/m²
Type of fiber	E-glass / H-glass
Direction	0°/45°/90°/-45°
standard width	127 - 254 cm
Extras	Other weights and widths Available upon request with and w/out CSM Veli upon request
Certifications	DNV-GL (0°/45°/90°/-45°; 625 - 3090 g/m²)

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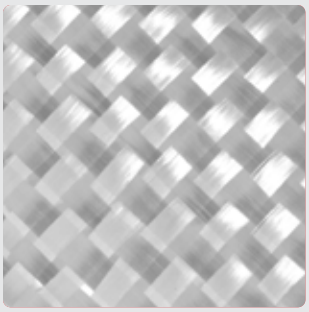
GLASS WOVEN FABRICS



GLASS WOVEN	
Fabric type	Glass Woven
Unit weight	80 - 1800 g/m^2
Type of fiber	E-glass
Direction	Twill - Plain
standard width	100 cm
Extras	Other weights and widths available upon request
Certifications	DNV-GL (200 - 1800 g/m^2)

COMBI WOVEN FABRIC	
Fabric type	Combi Fabric
Unit weight	300 - 1200 g/m^2 w/CSM
Type of fiber	E-glass
Direction	Plain weave
standard width	127 cm
Extras	Other weights and widths available upon request Veli upon request
Certifications	DNV-GL (200 - 1800 g/m^2)

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GLASS

METYCORE FABRICS

METYCORE	
Fabric type	RTM
Unit weight	CSM: 150 - 2400 g/m² PP core: 100 - 360 g/m²
Type of fiber	E-glass
standard width	127 - 163 - 254 cm
Extras	Other weights and widths Available upon request FS (Fire shield) option available
Certifications	DNV-GL

METYCORE MAX	
Fabric type	RTM
Unit weight	CSM: 300 - 2400 g/m² PP 3D core:100 - 200 g/m²
Type of fiber	E-glass
standard width	127 - 163 - 254 cm
Extras	Other weights and widths Available upon request FS (Fire shield) option available
Certifications	DNV-GL

METYX® composites

METYCORE FABRICS

METYCORE MULTI	
Fabric type	RTM
Unit weight	CSM: 150 - 1200 g/m² PP 3D core: 100 - 280 g/m² Non-Crimp: 300 - 3780 g/m²
Type of fiber	E-glass
Direction for Non-Crimp fabric	0˚/90˚; +45°/-45°
Standart Width	127 - 254 cm
Extras	Other weights and widths Available upon request

METYCORE VEIL	
Fabric type	RTM
Unit weight	CSM: 300 - 2400 g/m² PP core: 180 - 250 g/m² Surface Veil: 35 - 100 g/m²
Type of fiber	E-glass
Standard width	127 - 163 - 254 cm
Extras	Other weights and widths Available upon request
Certifications	DNV-GL

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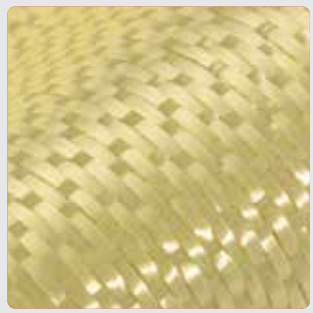
FABRICS - Aramid

ARAMID MULTIAXIAL FABRICS

ARAMID MULTIAXIAL	
Fabric type	Biaxial non-crimp fabric
Unit weight	200 - 1200 g/m^2
Type of fiber	Aramid
Direction	45°/-45° ; 0°/90°
standard width	127 cm
Extras	Other weights and widths available upon request With and w/out CSM
Certifications	DNV-GL (45°/-45° ; 270 - 1140 g/m^2) (0°/90° ; 200 - 1200 g/m^2)

ARAMID WOVEN	
Fabric type	Woven Fabrics
Unit weight	160 - 800 g/m^2
Type of fiber	Aramid
Direction	Twil - Plain
standard width	125 cm
Extras	Other weights and widths available upon request With and w/out CSM Available with web
Certifications	DNV-GL (200 - 800 g/m^2)



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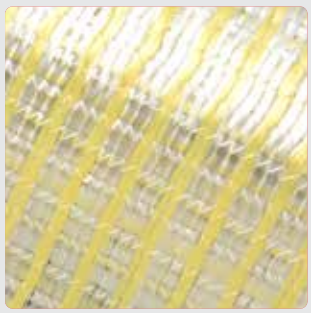
ARAMID HYBRID FABRICS

ARAMID CARBON HYBRID	
Fabric type	Woven Hybrid
Unit weight	170 - 800 g/m^2
Type of fiber	Aramid - Carbon Fiber
Direction	Plain - Twill
standard width	100 cm
Extras	Other weights and widths available upon request Available with web

ARAMID GLASS HYBRID	
Fabric type	Biaxial stitched non-crimp fabric
Unit weight	200 - 1200 g/m^2
Type of fiber	Aramid / E-Glass
Direction	45°/-45°;0°/90°
standard width	127 cm
Extras	Other weights and widths available upon request
Certifications	With and w/out CSM DNV-GL (45°/-45° ; 270 - 1140 g/m^2) (0°/90° ; 200 - 1200 g/m^2)



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VEILS - Surface

SURFACE VEILS

SURFACE VEILS	
Fabric type	Non-Woven Fabric
Unit weight	20 - 50 g/m²
Type of fiber	Polyester
Width	45 mm
Extras	Other weights and widths available upon request
Process	Filament Winding

SURFACE VEILS	
Fabric type	Non-Woven Fabric
Unit weight	20 - 100 g/m²
Type of fiber	Polyester
Width	Available upon request
Extras	Other weights availbale upon request
Process	Pultrusion

METYX composites

SURFACE VEILS

SURFACE VEILS	
Fabric type	Non-Woven Fabric (Perforforated)
Unit weight	35 g/m^2
Type of fiber	Polyester
Width	Available upon request
Extras	Other weights available upon request
Process	Pultrusion

SURFACE VEILS	
Fabric type	Non-Woven Fabric (Perforforated)
Unit weight	50 g/m^2
Type of fiber	100% PET
Width	Available upon request
Extras	Other weights available upon request
Process	Pultrusion

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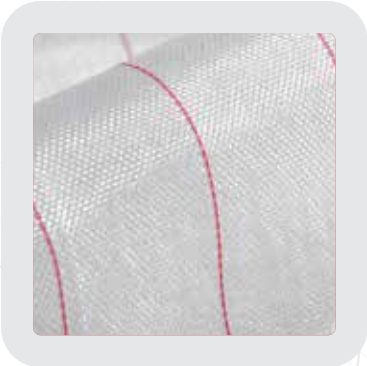
VACUUM CONSUMABLES
Peel Ply

PEEL PLY
VACUUM CONSUMABLES



PEEL PLY PA80R1-RED STR PEEL PLY-152CM	
Fabric type	Polyamide Peel Ply
Unit weight	80 gr
Type of Fiber	Nylon 6
Directions	Plain weave with red strips
Width	152 cm
Extras	Other wisths available upon request

PEEL PLY PA66-PA6 85R-RED STR PEEL PLY-100CM	
Fabric type	Polyamide Peel Ply
Unit Weight	80 gr
Type of Fiber	Nylon 66 + Nylon 6
Directions	Plain weave with red strips
Width	100 cm
Extras	Other wisths available upon request

METYX® composites

VACUUM CONSUMABLES

PEEL PLY

PEEL PLY PES80R-RED STR PEEL PLY 88GR-S-152CM	
Fabric type	Polyester Peel Ply
Unit weight	80 gr - 85 gr
Type of Fiber	Polyester Based
Directions	Plain weave with red strips
Width	152 cm
Extras	Other wisths available upon request

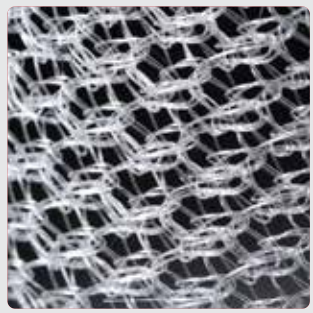
PEEL PLY	
Fabric type	Polyamide Peel Ply
Unit weight	80 gr - 85 gr
Type of Fiber	Nylon 66
Directions	Plain weave
Width	152 cm
Extras	Other wisths available upon request

METYX composites

FLOW MESH
VACUUM CONSUMABLES

FLOW MESH FMPE150B1-PE FLOW MESH-215CM	
Mesh Type	High Density Polethylene
Unit Weight	150 gr
Directions	2D - 3D Knitted Pattern
Color	Black
Width	100 -215 - 250 cm

FLOW MESH HFD7	
Mesh Type	Polethylene
Unit Weight	100 gr - 300 gr
Directions	3D Knitted Pattern
Width	163 cm - 330 cm



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BREATHER FABRICS

VACUUM CONSUMABLES

BREATHER PBA 150 PES BREATHER 150GR	
Fabric Type	Needle Punched Polyester
Unit Weight	150 gr
Width	100 - 150 - 200 cm
Extras	Other widths available upon request

BREATHER PBG300-POLY. BREATHER 300GR	
Fabric Type	Needle Punched Polyester
Unit Weight	300 gr
Width	100 - 150 - 200 cm
Extras	Other widths available upon request

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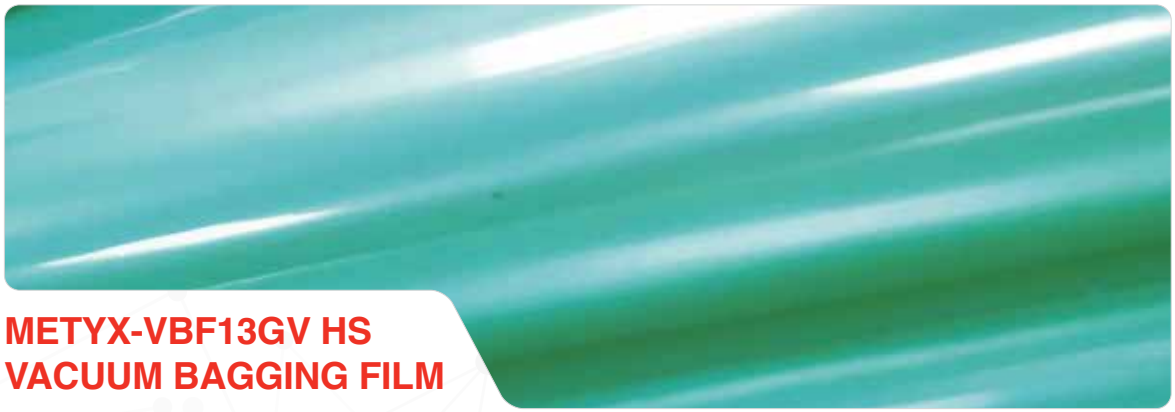
TECHNICAL DATA SHEET



METYX-VBF13GV HS
VACUUM BAGGING FILM

Description:

METYX-VBF130GV HS is a flexible, high strength mono nylon vacuum bagging film suitable for oven and autoclave cure temperatures up to 200°C

Size: 50µ available from 25mm tubular to 2300 tubular / 4600mm V-sheet 75µ available up to 2000 tubular/4000mm V-sheet (mm +2/-0 %)

FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Density	g/cm³	-	1,13
Product Width	mm	-	nominal
Thickness	µ	ISO 4593	50 ±10% 75 ±10%
Tensile strength at break MD	N/mm²	ASTM D882	110 ±10% 105±10%
Tensile strength at break TD	N/mm²	ASTM D882	105 ±10% 100 ±10%
Elongation at break MD	%	ASTM D882	360 ±10% 380 ±10%
Elongation at break TD	%	ASTM D882	390 ±10% 400 ±10%
Maximum use temperature	°C	-	200

Note:

The above are reference value only. For specific information for use in a particular application, contact with **METYX®** 's technical support team.

Store in original packaging.
This product can be recycled

TECHNICAL DATA SHEET

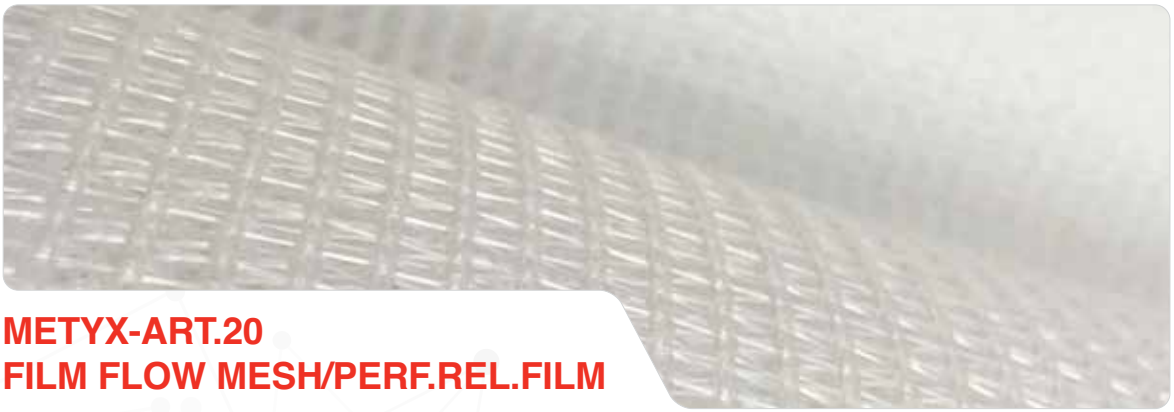
METYX-ART-23
FILM FLOW MESH/PERF.REL.FILM-1,4

Description:
This resin distribution medium, designed for use in vacuum assisted resin infusion processes where speed resin flow is needed. Constructed from **HDPE** and manufactured in a special knitted pattern is exceptionally effective when used as a resin distribution medium for **VARTM** (Vacuum Assisted Resin Transfer Moulding) process. Allows for a continuous air evacuation route when used with appropriate bagging materials. Good drapability properties make it perfect for use in areas of complex tooling geometry.

FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Area Mass	g/m²	UNI 9401	140
Width	m	UNI 9404	1,02-1,52
Length	m	UNI 9404	100
Tensile strength WARP	N/mm²	UNI 9405/89	≥136
Tensile strength WEFT	N/mm²	UNI 9405/89	≥84
Softening Point	°C	-	95 °C
Colour	-	-	Blue - Green
Maximum use temperature	°C	-	125 °C
Netting Mesh Size	mm	-	2,30 x 2
Perforation Density	g/cm³	-	31
Nominal Hole Size	mm	-	0,8
HDPE Film Thickness	µm	-	26
Netting and Film Weight	g/m²	-	180

TECHNICAL DATA SHEET



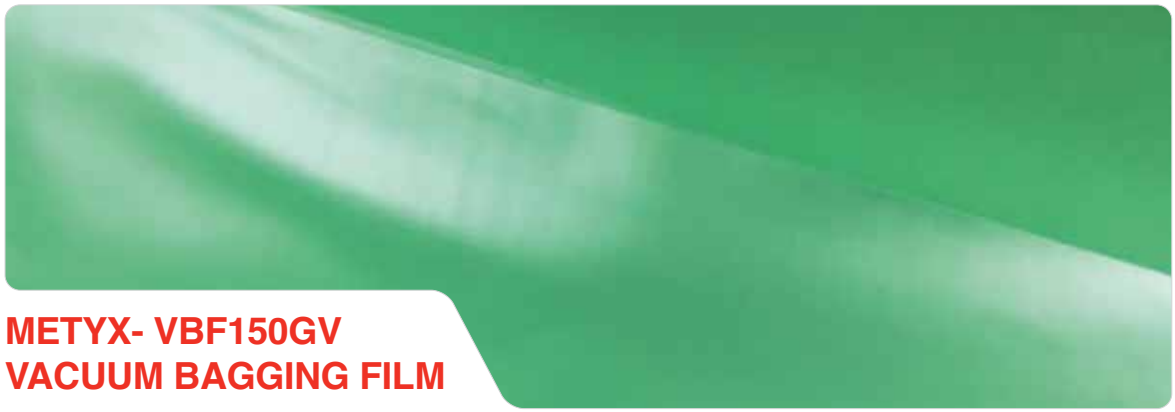
METYX-ART.20
FILM FLOW MESH/PERF.REL.FILM

Description:
This resin distribution medium, designed for use in vacuum assisted resin infusion processes where high speed resin flow is needed. Constructed from **HDPE** and manufactured in a special knitted pattern is exceptionally effective when used as a resin distribution medium for **VARTM** (Vacuum Assisted Resin Transfer Moulding) process. Allows for a continuous air evacuation route when used with appropriate bagging materials. Good drapability properties make it perfect for use in areas of complex tooling geometry. ART.20 netting is recommended for very large part.

FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Area Mass	g/m²	UNI 9401	135 +/-5%
Width	m	UNI 9404	1,45
Length	m	UNI 9404	100
Tensile strength WARP	N/mm²	UNI 9405/89	≥90
Tensile strength WEFT	N/mm²	UNI 9405/89	≥100
Softening Point	°C	-	95 °C
Colour	-	-	Black - Crystal
Maximum use temperature	°C	-	125 °C
Netting Mesh Size	mm	-	2,30 x 4
Perforation Density	Nr./cm²	-	5,3
Nominal Hole Size	mm	-	0,9
HDPE Film Thickness	µm	-	26
Netting and Film Weight	g/m²	-	165

TECHNICAL DATA SHEET



METYX- VBF150GV
VACUUM BAGGING FILM

Description:

METYX-VBF150GV is a tough, puncture resistant co-extrusion of polyethylene and nylon based resins which is designed for use in the production of polyester/vinylester resin infused components for the wind energy, marine and general composite industries. The product may be used with certain types of epoxy resin however we recommend testing for chemical resistance with the specific resin prior to committing to a large infusion. The film is particularly interesting due to its limited sensitivity to low humidity levels which are often problematic to predominantly nylon based films as the lack of moisture can reduce flexibility. This ensures consistent year long performance in all workshop environments.

FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Density	g/m²	-	0,97
Product Width	mm	-	75µ: up to 10 m 80µ: 12 m, 16 m
Thickness	µ	ISO 4593	75 ±10% 80 ±10%
Tensile strength at break MD	N/mm²	ASTM D882	38 ±10% 40±10%
Tensile strength at break TD	N/mm²	ASTM D882	35 ±10% 36 ±10%
Elongation at break MD	%	ASTM D882	370 ±10% 400 ±10%
Elongation at break TD	%	ASTM D882	400 ±10% 390 ±10%
Maximum use temperature	°C	-	120

Note:

The above are reference values only. For specific information for use in a particular application, contact with **METYX®**'s technical support team.

Store in original packaging.
This product can be recycled.

TECHNICAL DATA SHEET

METYX- VBF100BV
VACUUM BAGGING FILM

Description:
METYX-VBF100BV is a tough, high temperature resistant blue coloured co extruded nylon based vacuum bagging film, designed for use in the production of advanced composite structures such as wind turbine blades and nacelles, boat hulls and decks, plus other industrial structures. The film is ideal for use in both resin infusion and prepreg moulding applications and is resistant to all commonly used resin systems. Up to 12 metres wide. Film up to 4,6m wide supplied in sheet and V sheet. Widths 6m and above supplied gusseted, centrally slit.

Note: METYX-VBF100BV is not suitable for use in autoclave processing of composites

FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Density	g/cm³	-	1,05
Product Width	mm	-	1500 -0/+2%
Thickness	μ	ISO 4593	50, 65, 70, 75 ±10%
Tensile strength at break MD	N/mm²	ASTM D882	≥50
Tensile strength at break TD	N/mm²	ASTM D882	≥40
Elongation at break MD	%	ASTM D882	≥350
Elongation at break TD	%	ASTM D882	≥380
Maximum use temperature	°C	-	177

Note:
The above are reference value only. For specific information for use in a particular application, contact with **METYX®** 's technical support team.

Store in original packaging.
This product can be recycled

TECHNICAL DATA SHEET

METYX-FTB901-nn
ETFE FLUOROPOLYMER RELEASE FILM

Description:
ETFE fluoropolymer release film is the standard film for medium to high temperature curing of advanced composite structures. Its high strength and toughness, coupled with excellent release properties make it ideal for use with all commonly used resin systems in both oven and autoclave cures. **ETFE** film is available in non perforated and P3 perforated formats.

FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Colour	-	-	Blue
Product Width	mm	-	1220, 1300, 1500, 1530 -0/+2%
Thickness	µ	ISO 4593	15 ±10% 20 ±10% 25 ±10%
Tensile strength at break MD	N/mm²	ASTM D882	15 ±10% 20 ±10% 25 ±10%
Tensile strength at break TD	N/mm²	ASTM D882	46 ±10% 43 ±10% 50 ±10%
Elongation at break MD	%	ASTM D882	150 ±10% 200 ±10% 200 ±10%
Elongation at break TD	%	ASTM D882	430 ±10% 400 ±10% 450 ±10%
Hardness Shore D	-	ASTM D2240	70
Maximum use temperature	°C	-	230

Note:
The above are reference value only. For specific information for use in a particular application, contact with **METYX®** 's technical support team.

Store in original packaging.
This product can be recycled

TECHNICAL DATA SHEET

METYX-PRF FTP167-30R RELEASE FILM

Description:
METYX-PRF is a red coloured release film suitable both for resin infusion and prepreg processing. It is compatible with all commonly used resin systems. This product is available with P3, P31 and P16 microperforations. Maximum use temperature is 158°C

Thickness : 30μ
Lay flat width : 1500 mm

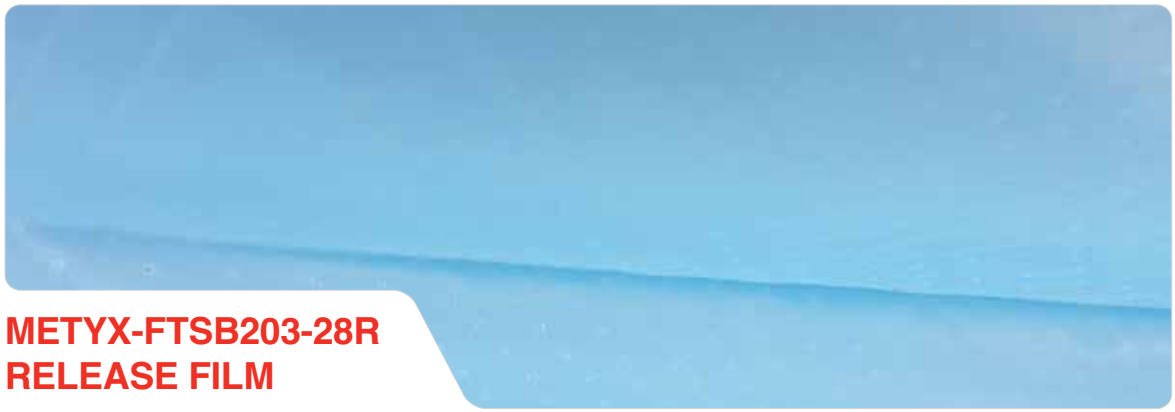
FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Density	g/cm³	Internal	0,97
Product Width	mm / -0 +2%	Internal	nominal
Thickness	μ / ±10%	ISO 4593	nominal
Tensile strength at break MD	N/mm² / ±10%	ASTM D882	55
Tensile strength at break TD	N/mm² / ±10%	ASTM D882	55
Elongation at break MD	% / ±10%	ASTM D882	320
Elongation at break TD	% / ±10%	ASTM D882	400

Note:
The above are reference value only. For specific information for use in a particular application, contact with **METYX®** 's technical support team.

Store in original packaging.
This product can be recycled

TECHNICAL DATA SHEET



METYX-FTSB203-28R
RELEASE FILM

Description:

METYX-FTSB 203-28R low temperature release film is designed for use in the processing of advanced composite structures in wet lay up, resin infusion, oven and autoclave conditions. It is compatible for use with a wide range of epoxy, polyester and vinylester resin systems however we recommend small scale trials prior to committing to large infusion mouldings. The film is available sky blue in colour and is offered with P3, P16 and P31 perforation patterns.

FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Density	g/cm³	-	0,97
Product Width	mm	-	1500 -0/+2%
Thickness	µ	ISO 4593	28 ±10%
Tensile strength at break MD	N/mm²	ASTM D882	38 ±10%
Tensile strength at break TD	N/mm²	ASTM D882	30 ±10%
Elongation at break MD	%	ASTM D882	360 ±10%
Elongation at break TD	%	ASTM D882	640 ±10%
Hardness Shore D	-	ASTM D2240	-
Maximum use temperature	°C	-	120

Note:

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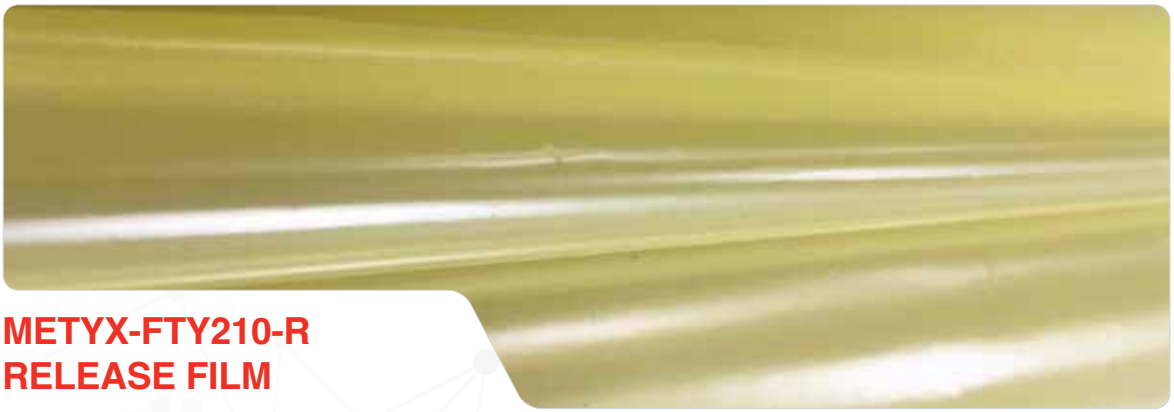
TECHNICAL DATA SHEET



METYX-FTY210-R
RELEASE FILM

Description:

METYX-FTY210-R is a mid temperature range, highly flexible polypropylene based release film. It is suitable for use with epoxy prepreg up to 150°c and may be used in resin infusion applications with a wide range of resin systems however we recommend small scale trials prior to commiting to large infusion mouldings. FTY210-R is yellow in colour and available with P3, P31 and P16 microperforations.

FILM PROPERTIES

TEST	UNIT	METHOD	VALUE
Density	g/cm³	-	0,97
Product Width	mm	-	1500 -0/+2%
Thickness	µ	ISO 4593	30, 45, 50 +/-10%
Roll length	m	ASTM D882	-0/+2%
Tensile strength at break MD/TD	N/mm²	ASTM D882	≥55/33
Elongation at break MD/TD	%	ASTM D882	≥390/560

* Test values based on 30µ film

Note:

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Store in original packaging.
This product can be recycled

TECHNICAL DATA SHEET

METYX-VACFLEX PLUS/PP/FM/REL.1,52
FLOW MESH + RELEASE FILM + PEEL PLY

Description:

Designed to replace up to three consumables with a single layer **METYX-Vacflex Plus** offers direct benefits.

- Highly conformable resin distribution medium
- Reduce costs and handling time, simplifying the process significantly
- Creates a textured surface which improves adhesion in secondary bonding or painting

Constructed from **HDPE** and manufactured in a special knitted pattern is exceptionally effective when used as a resin distribution medium for **VARTM** process. Allows for a continuous air evacuation route when used with appropriate bagging materials. Good drapability properties make it perfect for use in areas of complex tooling geometry.

FILM PROPERTIES

PROPERTIES	VALUE
Nylon Peel Ply Area Mass	80 g/m²
Netting Area Mass UNI 9401	140 g/m² ± 5%
Width UNI 9404	1,52 m
Length UNI 9404	100 m
Netting Tensile Strength UNI 9405/89	Warp; 136,6 daN, 139,4 Kgf
Netting Tensile Strength UNI 9405/89	Weft; 84,3 daN, 86,0 Kgf
Net Thickness EN ISO 5084:1998	1000 µm
Softening Point	95°C - 203°F
Maximum Use Temperature	125°C – 257°F
Peel Adhesion UNI EN ISO 2411:2001	Warp-Along 1,48 N Weft-Across 0,97 N
Netting Mesh Size	2,30 x 2 mm
Film Perforation Density	31 P
Nominal Hole Size	0,6 mm
HDPE Film Thickness	26 µm
Film Percentage Open Area (POA)	1,616 %
Total Weight	220 g/m²
Paraffin Presence in the Fabric : UNI 9278:1988	< 30 mg/m²

METYX composites

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KITTING-Core Kit

KITTING SERVICES

Core Kitting

Customized kitting services are offered from Turkey, Hungary and USA, for cores, fabrics and vacuum consumables.

All kit designs are fully evaluated by **METYX®** engineers who take into account cost, quality, part geometry, mold lay-up and the manufacturing process being used. **CAD** data is used to ensure the accuracy of each kit.

Kits are supplied cut, shaped, and preformed as needed, packed and labelled according to customer-specified part reference numbers. The full traceability ensures shop floor accuracy, efficiency and productivity.

METYX® continues to invest in **'state-of-the-art'** 5-axis NC processing centers with the highest levels of accuracy.

The kitting facilities can cost effectively machine balsa wood and all foam core materials including: **PU, PET, SAN** and **PVC**.

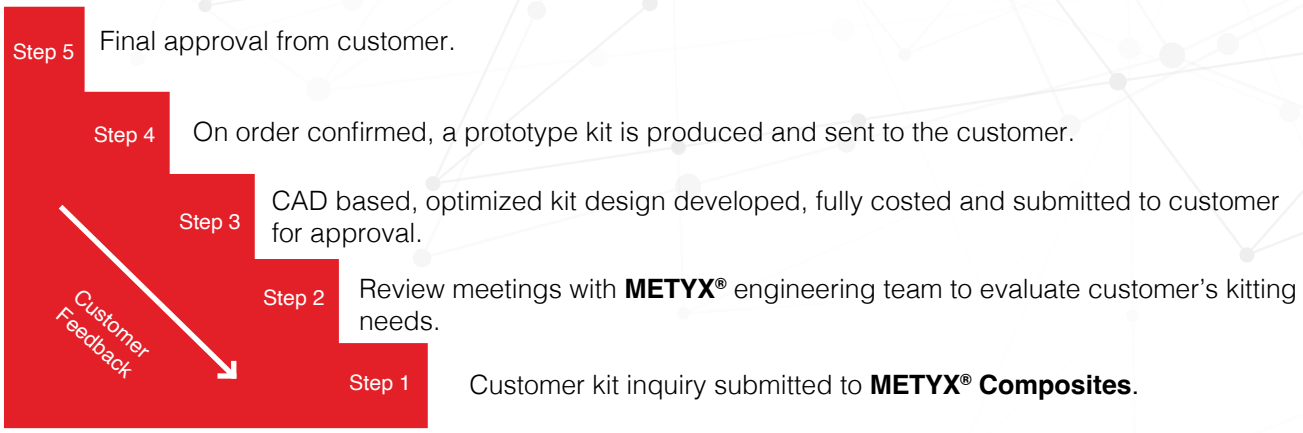
Core Material Kitting Capabilities

- Grooved
- Perforated
- Scrim fabric applied
- Single or double contoured
- Combinations of stated finishing options

Faster and easier dry lay-up in molds using accurately pre-cut, numbered, kit parts

- Increased productivity, with reduced waste, overall build times and labor costs
- Consistent, reliable production quality, with optimized part weight and properties
- Kits delivered 'just in time' as needed minimizing material stock
- Prototyping before serial production
- Flexible, highly responsive, fast turnaround kitting service

Our Customized Engineered Kitting Service Process - We are with our customers every step of the way



METYX composites

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KITTING-Fabric Kit

KITTING SERVICES

Fabric and Vacuum Consumables Kitting

Customized kitting services are offered from Turkey, Hungary and USA.

All kit designs are fully evaluated by **METYX®** engineers who take into account cost, quality, part geometry, mold lay-up and the manufacturing process being used. CAD data is used to ensure the accuracy of each kit.

Kits are supplied cut, shaped and preformed as needed, packed and labelled according to customer-speci fied part reference numbers. The full traceability ensures shopfloor accuracy, efficiency and productivity.

METYX® Composites kitting centers are also able to cut the full range of multiaxial, RTM and woven reinforcements as well as supplying kits with vacuum consumables.

CNC fabric cutting machines are capable of handling fabric widths up to 100 inches in a very efficient and cost-effective way by minimizing scrap rates and reducing material costs.

Faster and easier dry lay-up in molds using accurately pre-cut, numbered, kit parts,

- Increased productivity, with reduced waste, overall build times and labor costs,
- Consistent, reliable production quality, with optimized part weight and properties,
- Kits delivered 'just in time' as needed minimizing material stock,
- Prototyping before serial production,
- Flexible, highly responsive, fast turnaround kitting service.

Step 1 Customer kit inquiry submitted to **METYX®** Composites.

Step 2 Review meetings with **METYX®** engineering team to evaluate customer's kitting needs.

Step 3 CAD based, optimized kit design developed, fully costed and submitted to customer for approval.

Step 4 On order confirmed, a prototype kit is produced and sent to the customer.

Step 5 Final approval from customer.

Customer Feedback

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composites

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TOOLING

TOOLING SERVICES

From Concept to Delivery...

All tooling projects customized and specified based on customer requirements.

The tooling team has expertise in large scale tooling projects for:

- Wind blade mold components
- Hull and deck plugs and molds for boatbuilding
- Complex design tooling for automotive & transportation
- Multiple component architectural projects
- Direct mold for limited volume parts (Limited Production Molds)

Tooling Engineering Services & Support

We offer engineering support, rapid prototyping and tooling consultancy using '**state-of-the-art**' design and production software, for customers in all market sectors.

Master Plug (Pattern) Production

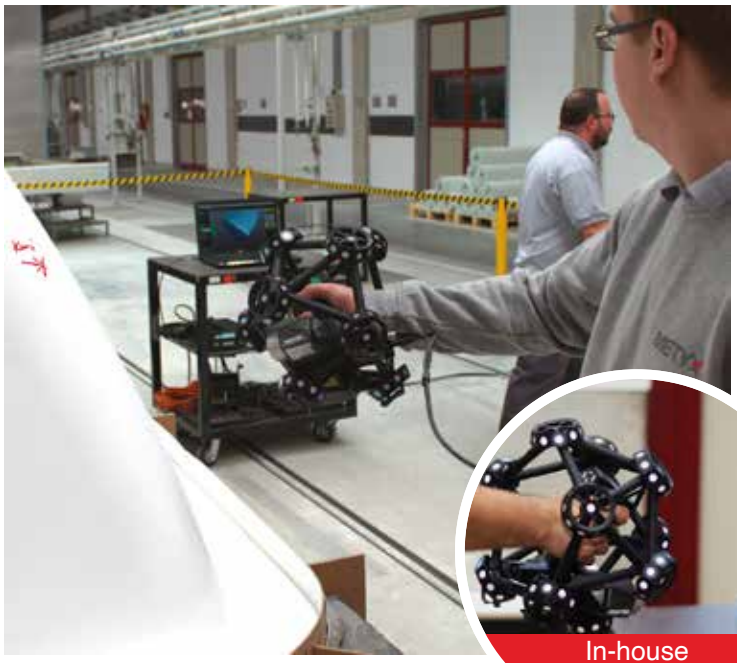
Standard master plugs are typically manufactured using a tooling board or foam-based glass reinforced laminate base, onto which and epoxy or polyester paste is applied. Once set, the paste is then precision (CNC) milled to create the final surface before finishing. The last step is the application of a primer and top coat, which is then sanded and polished to a high gloss finish.

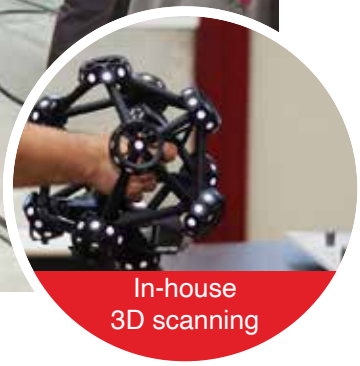
Master Plug Making Materials:

- Tooling board
- PU and epoxy foam
- Polyester and epoxy paste
- Primer and top coat

Master Plug Features:

- Shape stability, with 5-axis CNC milled accuracy and finish
- Large plug production capabilities up to 10m x 6m x 4,5 m
- High gloss surface finish
- Modular production of single or multi section plugs
- Gel coating and post curing to order





In-house
3D scanning

FRP Mold Production

FRP molds with the required mechanical properties for molding finished composite components are produced from the high quality master plugs. Large scale single and multi-split FRP molds are produced for the hand lay, spray up, RTM, and infusion processes.

FRP Mold Making Materials:

- Polyester tooling resins
- Epoxy tooling resins
- Vinylester and epoxy tooling gelcoats
- Custom reinforcement solutions manufactured by **METYX® Composites**

Direct Limited Productions Mold (LPM)

Our tooling center also produces large-scale molds using a direct technique, which is a very cost effective solution for producing prototypes and for one off or limited production components, especially for projects with a limited budget or tight timescale which require a fast tooling solution.

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TESTS

TESTS:

Physical and mechanical testing of composites ensures taht materials comply with industry specifications. This applies to wind turbines, marine, automotive, transportation, construction and industrial industries amongsrt others.

As a full solution provider, the breadth of METYX®'s physical and mechanical testing capabilities includes ASTM, ISO, BS or DIN standards using industry standard testing methods.

Our composite testing services include:

- Mechanical testing including tensile, flexural, shear and compressive properties
- Physical testing including fiber/resin and void content, density, hardness
- Adhesion property testing
- Thermal testing including DSC
- Rheological testing including dynamic & rotational viscosity
- Optical testing including microscopic analysis

Specimen Manufacturing

Our composite work shop & machining center enables us to produce samples according to your specific customer requirements. From raw materials, semi-finished products and components, we produce high-quality test specimens according to national and international regulations or according to customer specifications, regardless of composite materials.

Our composite lab allows us to produce the highest quality test specimens in accordance with national and international standards or match specific customer specifications regardless of the composite materials/process used.

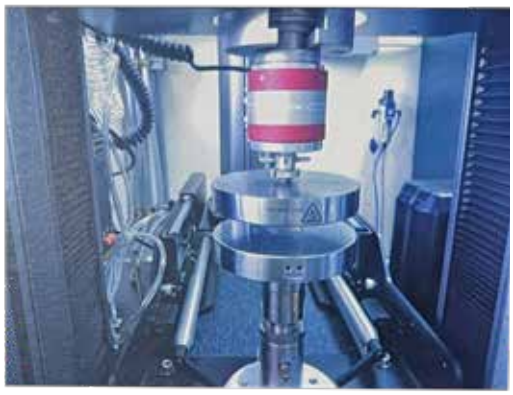
Tensile Testing

METYX® has load frame capabilities 50N to 250kN for mechanical testing, using a wide variety of grips and extensometers. METYX® also has the extensive capabilities to utilize strain gage technology to determine such properties as Poisson's ratio.

Various Testing Methods:

- ASTM D 3039
- ISO 527
- ASTM D 3518 (±45° shear)
- EN ISO 14129 (In plane shear)
- ASTM D 1002 (Lapshear)
- ASTM D 5656 (Trick adherend lap shear)
- ASTM C 297 (Flatwise tensile)
- ASTM D 3528 (Double lap shear)

Compression Testing

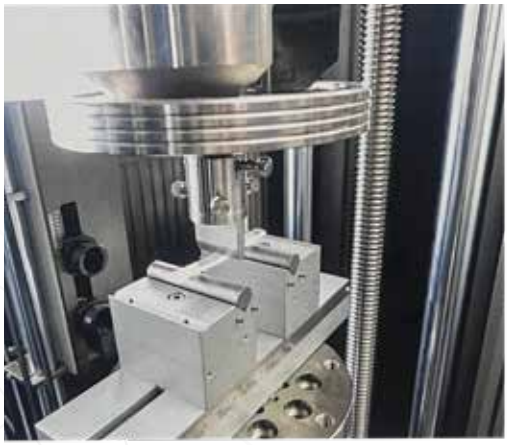


METYX® conducts a veriety of compression test using ASTM an EN ISO based, fixtures, as well as strain gaging for the most accurate information possible from Youngs modulus to ultimate strain of a specimen.

Related testing methods:

- ASTM D3410
- ISO 14126
- EN ISO 604
- ASTM D 695
- ASTM D6641

Flexural Testing



METYX® has a variety of 3 point and 4 point bend fixtures, allowing for specimens of all sizes. We provide flexural modulus values and strain at yield (among other material characteristics)

Related testing methods:

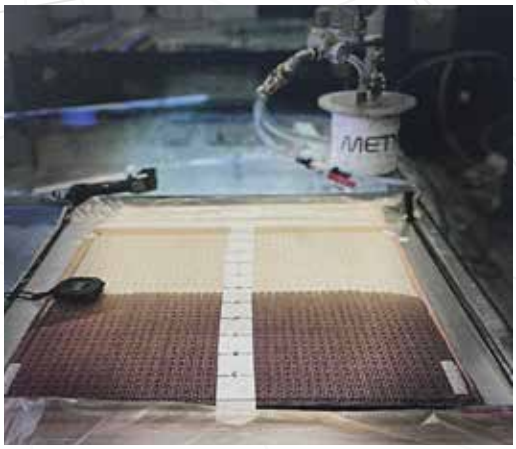
- ASTM D3410
- ISO 14126
- EN ISO 604
- ASTM D 695
- ASTM D6641

Lap Shear

Testing is conducted using standard tension/compression mechanical test equipment with a suitable pair of self-aligning (manual or servo hydraulic wedge-action) grips to hold the specimen.

Related testing methods:

- ASTM D 1002 (Lapshear)
- ASMT D 5656 (Thick adherend lap shear)
- ASTM D 3528 (Double lap shear)



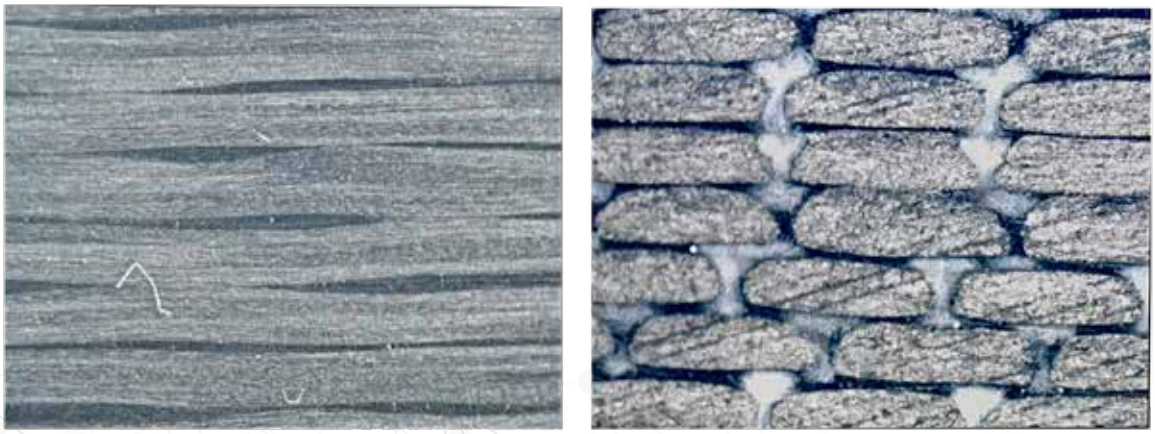
Quantify Resin Impregnation Capability of Composites

Evaluating the resin impregnation level is important to processing of the fiber lay-up material and the finished composie part quality. This can be monitored with several impregnation methods such as RTM, RTM-L and/or infusion.

- Resin flow characteristics (speed, area, etc.)
- Gel time
- Tack & drape properties
- Ply thickness

Failure Analysis Optical

METYX® can monitor failure modes of composites during mechanical teting in macro mode by recording with video and in micro mode with stereo microscopy after failure op specimen.



Microscopic images of carbon fiber reinforced composite's cross-section.

Physical & Thermal Testing

METYX® has the capability to meeasure fiber weight & volume content in composites including density, void content and hardness.
Thermal properties such as Glass transition temperature, melting temperature, crystallization temperature, ΔH analysis by DSC method for non-cured or cured resins, composites and polymers.

METYX®
composites

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Core Kitting, Fabric Kitting, Prototyping.

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