



METEX[®]
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STRENGTH. SUPPORT. SOLUTIONS.

**WIND
ENERGY**

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ABOUT

METYX Composites

METYX manufactures and supplies an extensive range of multiaxial, RTM and woven fabric technical textile reinforcements from its three 'state-of-the-art' production facilities in Turkey and Hungary, which all operate under ISO 9001, ISO 14001 and OHSAS accreditations.

In addition to wind energy, other key industries using METYX products include: marine, automotive, transportation, infrastructure, building and construction, sport and leisure.

METYX has invested in both production equipment and highly skilled staff to offer customers added value products, custom solutions, technical support and a highly responsive, reliable logistical supply service.

Your 'Solution Partner'

METYX offers its customer exceptional service, quality and logistical support, with technical expertise which can help to reduce costs and add real value to a business.

Our Vision

"Our vision has always been to deliver a range of high quality products and services which give our customers a competitive advantage. We are totally committed to meeting the individual needs of our customers with tailor made solutions that add real value."

Uğur Üstünel,
Managing Partner,
METYX Group

Products & Services for Wind Turbine Producers

METYX has rapidly grown to become an established, market leading supplier of products and services for manufacturing composites components. Major global OEM wind turbine producers have been successfully supplied by METYX for many years, with a growing wind energy customer base.

To meet increasing customer demand globally, METYX has continued to expand its production facilities and extend the range of composites products and services offered, with special focus on the wind energy market; the expansion of production sites in Turkey and Hungary was mainly to follow the growth of the wind industry.

Responding to market needs, METYX has developed new glass and carbon fiber reinforcement product that are specifically designed for the manufacturing of wind turbine composite components, as well as building greater expertise and capabilities in tool making and kit cutting.

The extensive range of METYX products and services provided for wind turbine manufacturers includes:

- E-glass, H-glass and carbon fiber based unidirectional (UD), biaxial and triaxial multiaxial standard & custom made fabrics.
- In-house manufactured vacuum infusion consumables - peel plies, breather fabrics and flow meshes.
- Kitting services for fabrics, cores (PVC, PET, PU, SAN, balsa) and vacuum consumables.
- Composite tooling design and fabrication (plugs and molds).
- Engineering and production processing technical support.
- Prototyping and GL laboratory testing services.
- Bought-in products from approved suppliers: continuous filament mats (CFM), vacuum leak detectors, vacuum bagging materials, balsa and foam cores, mold release agents, surface veils, structural adhesives, resins and hardeners, gel coats, sheet wax products.

METYX helps manufacturers of wind turbine components discover ways to improve quality, increase production efficiency and reduce costs.

Photo courtesy of LM



Multiaxial glass and carbon fiber fabrics

METYX has developed an extensive range of UD and multiaxial non-crimp glass and carbon fiber technical fabrics for reinforcing wind turbine composite parts such as: spar caps, shear webs, blade shell and root segments, nacelles and spinners.

A standard range of high quality, E-glass, H-glass, carbon fiber multiaxial products, as well as custom made multiaxial fabrics, are manufactured by METYX in Turkey and Hungary on dedicated production lines for knitting both glass and carbon fiber multiaxial fabrics.

The range of multiaxial glass and carbon fiber tapes and technical fabric products available includes:

- UD glass and carbon tapes and fabrics supplied in rolls from 200 gsm up to 2,500 gsm in 127 cm and 254 cm width options, or cut to size as required in a choice of low and high density fabrics.
- Multiaxial glass fabrics for turbine blades in standard 1270 mm or 2540 mm widths, and areal weight options from 1270 mm or 2540 mm widths.
- Biaxial (0/90 and +45/-45) glass fabrics in 127 cm or 254 cm width options for nacelles and spinners

Meeting longer and lighter wind blade design needs

To achieve the lightweight, high strength design needed for modern wind blades, which can now be over 60 meters in length, many laminate designs now typically use a combination of cores, UD and multiaxial carbon fabrics and UD tapes, with a growing trend for larger blades towards the use of Automated Tape Layup (ATL) and Automated Fiber Placement (AFP) to reduce labor and improve quality. UD carbon fiber tapes and multiaxial carbon fabrics have been added to the METYX range to meet a growing demand, especially from OEMs looking to design and manufacture larger rotor blades.

METYX also provides wind energy customers technical support and other added value services, such as fabric cutting and kitting, composite tool making and laboratory testing.

Photo courtesy of ENERCON



ADDED VALUE SERVICES
 METYX PROVIDES CUSTOMERS
 WITH ADDED VALUE SERVICES
 AND TECHNICAL SUPPORT.

METYX Kitting Services

A customized kit cutting service using 'state-of-the-art' 5-axis CNC processing centres is offered from both Turkey and Hungary.

Core Material Kitting

The kitting centres cost effectively machine balsa wood and all foam core materials including: PU, PET, SAN and PVC foams. Core material finishing options or finish combinations include: grooved, perforated, scrim fabric applied, and single or double contoured. Installed equipment includes a high productivity slicing machine, which can very rapidly cut to size PVC and PET foam block material.

All kit designs are fully evaluated by experienced METYX engineers, supported with CAD data, with a key objective being to provide added value kitting solutions which enable faster and easier dry lay-up in moulds.

Kits are cut, shaped, and preformed as needed to the highest levels of accuracy, supplied with full traceability.

Fabrics & Vacuum Consumable Kitting

A kitting service is also offered for the complete range of METYX technical fabrics and vacuum consumables such as peelply, flow mesh, and breather fabrics. To minimize waste and reduce cost, the largest CNC kit cutting machines, able to handle fabrics up to 3.5M wide, are used for large orders.



METYX Tooling Centre

METYX has a dedicated Tooling Business Unit, located in the 27,500 sq.m 'state-of-the-art' production facility at Manisa, Turkey. It offers design and manufacturing support to customers looking for affordable, high quality tooling solutions. Single and multi-split, FRP moulds are produced for: hand lay, spray up, RTM, and infusion processes.

The METYX Tooling team has particular expertise in producing large scale composite plugs and moulds. Very large moulds are increasingly needed as demand for superyachts over 24 metres long continues to grow globally.

Master Plug (Pattern) Production - Standard master plugs are designed and manufactured in-house using an epoxy tooling paste.

Key METYX Master Plug Features include:

- Expertise in machining tooling board, PU and Epoxy paste plug making materials,
- Shape stability, with 5-axis CNC milled accuracy and finish,
- Large plug production capabilities - up to 10m x 6.2m x 4m
- High gloss polished surface finish – no imperfections,
- Tested to ensure no vacuum leaks,
- Modular production of single or multi sectioned plugs,
- Integrated plug heaters can be specified.

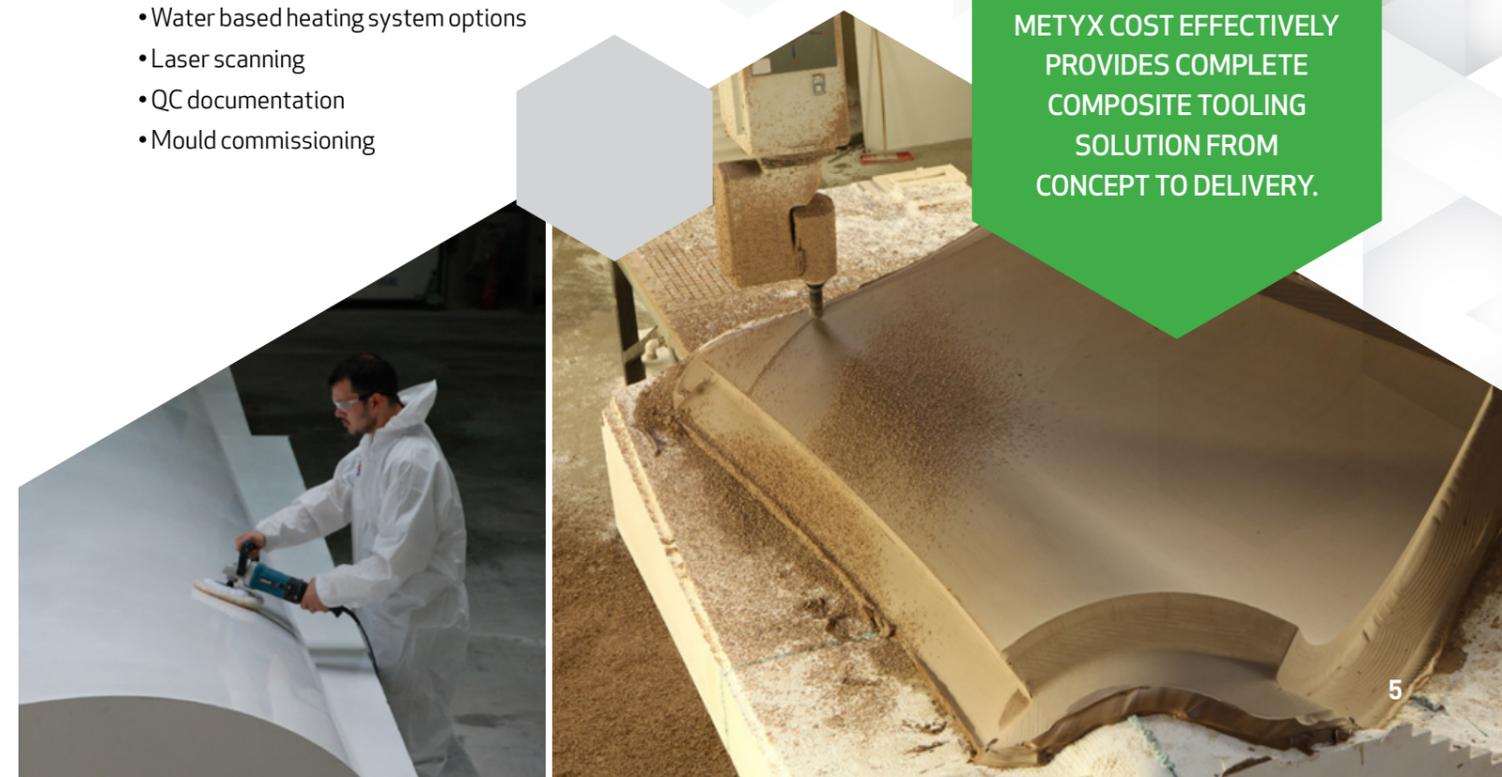
FRP Mould Tool Production - FRP moulds are produced from high quality, surface defect free master plugs.

Direct negative moulds are cost effectively produced for prototypes, one off or short run components – the direct moulding technique is ideal for projects with a limited budget or tight timescale needing a rapid tooling solution.

Key METYX FRP Mould Tool Features:

- Only quality UPR / VE / Epoxy tooling materials are used for high durability
- Mould shell supports as needed for tool life
- Excellent part production repeatability
- Water based heating system options
- Laser scanning
- QC documentation
- Mould commissioning

**METYX COST EFFECTIVELY
 PROVIDES COMPLETE
 COMPOSITE TOOLING
 SOLUTION FROM
 CONCEPT TO DELIVERY.**



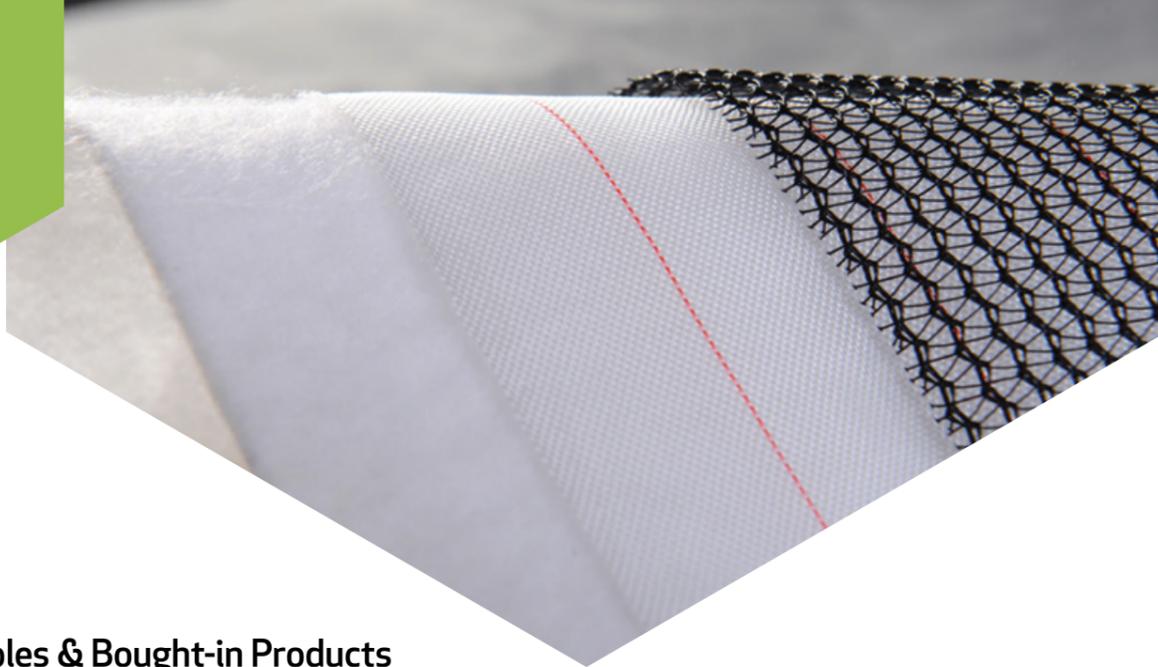


Photo courtesy of TPI

Vacuum Consumables & Bought-in Products

METYX manufactures a range of peel ply, flow mesh, and breather fabric vacuum consumables, supplied in bulk, on a roll, or as cut to size kits, as well as sourcing a wide range of bought-in products regularly needed by wind energy customers manufacturing FRP parts.

The range of high quality materials, infusion consumables and ancillary manufacturing products sourced from leading suppliers includes: 3B continuous filament mats (CFM), vacuum leak detectors, vacuum bagging consumables, core materials, Axel and TR Industries mold release agents, JM surface veils, adhesives, resins and hardeners, gel coats, sheet wax products.

Key stockholding and reordering is provided to strategic customers for the key materials regularly needed for manufacturing composite wind turbine blades and other components, with a tailored logistics supply chain service.

Specialist Injection Equipment Partner

Where needed, assistance is also given to specify and source specialist closed mold injection equipment such as: vacuum pumps, resin transfer molding and resin infusion injection machines. METYX works in close partnership with UK based Composite Integration Ltd., an innovative, world leading RTM and infusion technology design and injection equipment manufacturing company.

Other Services

Engineering Services & Support

METYX offers engineering support using the very latest design and production software to customers in all industrial market sectors, including wind energy. Services provided include: reverse engineering; rapid prototyping; tooling consultancy.

Laboratory & Testing Services

METYX offers extensive laboratory and rapid response testing services to its customers. METYX lab technicians have expertise in hand lay-up, vacuum infusion, RTM and hot pressing, with the skills and equipment needed to carry out lab scale production of composite laminates. Testing capabilities includes flow testing, along with fabric, laminate and base materials testing to provide key physical and mechanical property data.



Quality Systems

METYX has ISO 9001 Quality, ISO 14001 Environmental and OHSAS 18001 Occupational Health and Safety Management Systems certification. These standards ensure that all products and services are consistently provided to the very highest quality standards.

Quality assurance and in-line quality control is critical to everyone working in METYX. Each person is highly committed and totally dedicated to consistently providing customers with the highest quality products and services. Ongoing investments are made in latest technologies available to ensure quality standards are maintained. This has included the installation of surveillance camera systems on production lines which constantly monitor product quality in real time.

METYX has gained a variety of independent accreditations and certifications needed to serve global OEMs and industry suppliers in demanding markets such as: marine, automotive and wind energy.



Responsive Logistics Service

METYX has invested in extensive warehousing and logistics facilities both at the Manisa factory in Turkey, which handle both local and global export orders, and at the factory at Kaposvár in Hungary which mainly supplies EU customers. METYX has strategic supply chain partnership agreements with key wind energy customers to ensure that a highly responsive, reliable delivery and logistics service is provided.

The Manisa factory, with its expanded warehousing and distribution facilities, supplies customers nationally across Turkey, including the wind industry manufacturing cluster in the Aegean region, as well as a growing number of export customers. Manisa is ideally located for supplying export orders, being close to the port of Izmir as well as within easy reach of Istanbul airport.



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"Everybody in METYX shares a strong passion for the business. We constantly look for innovative, added value solutions. Our commitment and total dedication is what METYX customers' feel in the quality of the products and services we consistently provide."

- Bahattin Şendoğan, METYX Sales Group Manager

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