



### FRP Mold Tool Production

FRP molds with the required mechanical properties needed for molding finished composite components are produced from the high quality, defect free master plugs.

Large scale single and multisplit FRP molds are produced for: hand lay, spray up, RTM, and infusion processes.

### Direct Negative Molds

**Tooling Center** also produces large scale molds using a direct molding technique, which is a very cost effective solution for producing prototypes and for one-off or limited run components. Direct negative molds are key for projects with a limited budget or tight timescale needed a fast tooling solution.

#### FRP Mold Tool Making Materials:

- Polyester rapid tooling resins,
- Epoxy tooling resins,
- Vinyl ester and epoxy tooling gelcoats,
- Custom reinforcement solutions manufactured by METYX Composites.

#### FRP Mold Tool Features:

- Only quality tooling materials used for high durability,
- Mold shell supports as needed for tool life,
- Excellent part production repeatability,
- Water based heating system,
- Laser scanning for dimensional stability confirmation,
- QC documentation,
- Mold commissioning.

The METYX Composites Tooling Center provides customers with a cost effective complete composite tooling solution *from concept to delivery.*



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# TOOLING SERVICES

## ABOUT

### METYX Composites

METYX, supplies an extensive range of multiaxial, RTM and woven fabrics at its four production locations in Turkey, Hungary and US. Industries using METYX products today include: wind energy, marine, transportation, infra structure, building and construction, sport and leisure.

METYX has also invested in facilities, equipment and highly skilled staff to offer customers value added through custom solutions and technical services such as laminate design, analysis, process engineering support, prototyping, large scale tool making and a customized kit cutting service from both Turkey and Hungary, for cores, fabrics and vacuum consumables.

### Your 'Solutions Partner'

METYX offers exceptional service, quality and logistical support which can help to reduce costs and add real value to your business.

## METYX Composites Tooling Center

METYX has invested in a Tooling Business Unit, located in the 247,570 ft<sup>2</sup> 'state-of-the-art' production facility at Manisa, Turkey.

METYX Composites Tooling Center was set up in response to customer and market needs. It aims to offer design engineering and manufacturing support to customers looking for affordable, high quality tooling solutions.

The METYX Composites tooling team has particular 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 negative (female) mold for limited production / volume parts.

## Tooling Engineering Services & Support

METYX offers laminate design, analysis and process engineering support, rapid prototyping and tooling consultancy using 'state-of-the-art' design and production software, to customers in all industrial market sectors.



## Master Plug (Pattern) Production

Standard master plugs are typically manufactured using a tooling board or foambased glass reinforced laminate base, onto which an 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 appli-

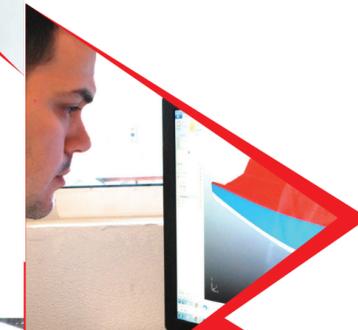
cation of a primer and top coat, which is finely sanded and polished to a high gloss surface finish.

### 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 32.8' x 19.6' x 14.7'
- High gloss polished surface finish
- Modular production of single or multi sectioned plugs
- Double gel coating and post curing to order



"The industry needed a reliable tooling provider, technically able to handle customers' challenges rapidly and effectively. This approach triggered our investment decision. We now deliver complete tooling solutions, enabling our customers to stay focused on growing their core business"

Tunç Şerif Üstünel,  
METYX Composites Board Advisor

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

Uğur Üstünel,  
METYX Composites CEO

### Case Study 01

## Water Heated Epoxy Mold for Wind Blade Component

In response to wind sector customer inquiries, METYX set up a technical project team in 2015 to develop new capabilities to manufacture and supply heated tooling. The project was a great success, following prototypes and customer trials, and heated epoxy tools are now being manufactured by Tooling Business Unit at the Manisa factory in Turkey.



### Case Study 02

## Precision METYX Plugs for Damen Water Bus Modular Parts

METYX supplied more than 20 precision CNC machined plugs (total area about 2,100ft<sup>2</sup> (200m<sup>2</sup>)) to Damen Shipyards Antalya for the key modular tooling needed for the various modular FRP hull and superstructure composite parts needed to produce its range of catamaran design Water Bus vessels.

