

# 2010 Activities Report



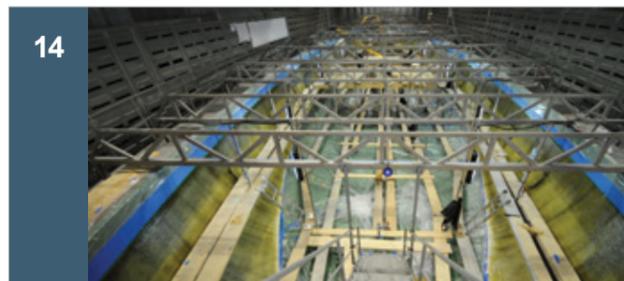
Photo courtesy of Sirena Marine®.

**METYX**<sup>®</sup>  
c o m p o s i t e s  
STRENGTH. SUPPORT. SOLUTIONS.

## **METYX Composites**

Merkez Mah. Cesme Cad. Palamut Sok. 34956  
Orhanli Tuzla-Istanbul/Turkey

Tel.: +90 216 394 32 60  
Fax: +90 216 394 32 58  
Email: [metyx@metyx.com](mailto:metyx@metyx.com)  
Web: [www.metyx.com](http://www.metyx.com)



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Contact:  
Nancy Bukonja, Marketing Manager  
nancy.bukonja@metyx.com

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**Executive Letter**

Dear friends and colleagues:

We have once more left behind a year filled with newsworthy developments and success stories that we and are delighted to share with you in this report.

**Always moving forward.**

Much like the year that preceded it, 2010 was a trying time for the composites industry. However, by focusing on the fundamentals of our company, the needs of our clients, and product innovation, we not only managed to prosper, but we also achieve our best year to date. Following are some of the highlights:

- Investment in our carbon weaving capacity and glass weaving for specialty markets
- New warehouse for finished goods inventory at our Istanbul facility to expedite order fulfillment
- Expansion of our existing headquarters to accommodate new office personnel and factory workforce
- Construction of a second insulated production hall for carbon reinforcements
- Investment in another METYCORE line to accommodate increased demand from our RTM customers
- Addition to our sales team with the goal being increased service levels to our customers
- Qualifications at vital accounts such as Marco Polo (MVC) in Brazil and several other leading automotive and marine customers

**In appreciation...**

With that, it is our turn to communicate our appreciation to you – our valued customers, partners, and colleagues – for making 2010 another highly successful year. We thank you for your hard work, your cooperation, and for your ongoing support. We look forward to new and exciting opportunities in 2011 and to serving you to our utmost ability.

Best regards,

Ugur Ustunel  
 VP, New Business Development  
 METYX Composites



Tunc S. Ustunel  
 Sales and Marketing Director  
 METYX Composites

## New Investments

### New METYCORE Line

Driven by economic recovery in several segments of the composites industry, there was a significant increase in demand worldwide for RTM reinforcements. Many METYX Composites customers qualified our RTM range and quickly placed sales orders. Investment in another METYCORE line was necessary in

order to maintain the highest service levels to our valued customers.

### Carbon Weaving

We built a second insulated production hall this year, in addition to our first Carbon Hall build in 2009. We see great potential in the local and export markets for reliable, high quality carbon reinforcements. The

new investment in our carbon weaving capacity proved to be an on target business decision. We have already fulfilled orders from seismic retrofit projects as well as marine and automotive customers.

### Narrow Weaving for Glass

As a new addition to our weaving capacity, we now have a narrow weav-

ing line focused solely on specialty reinforcements. Our team has made great strides in developing certain niche products.

### New Warehouse

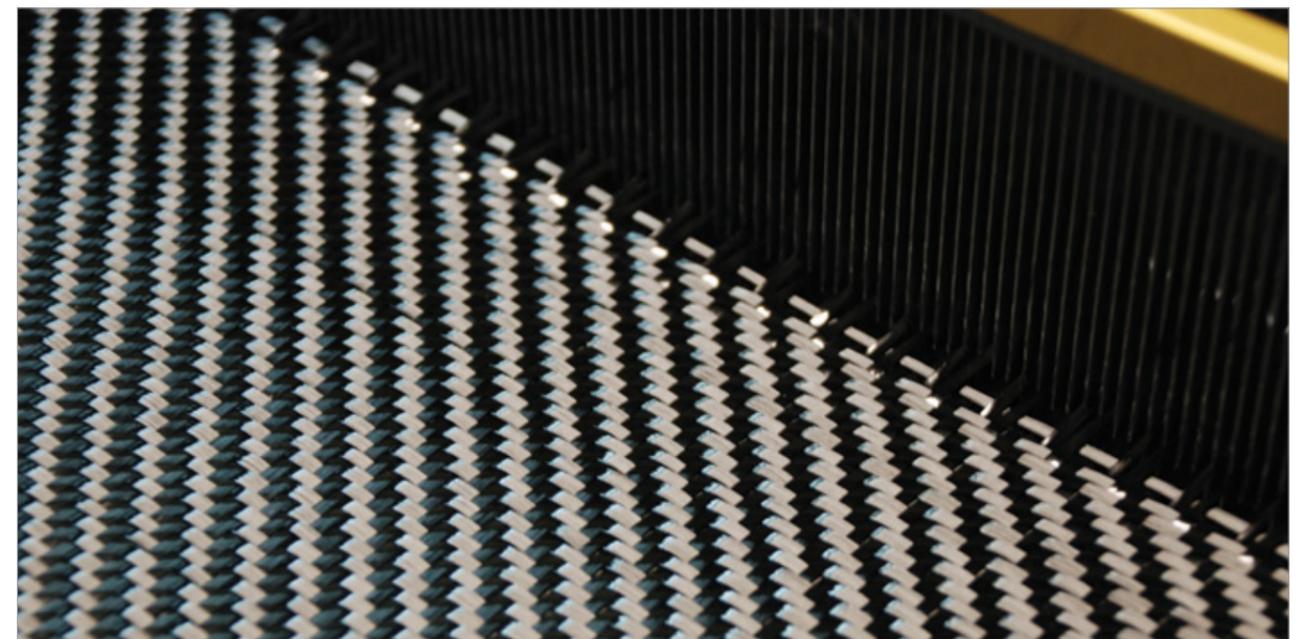
We invested in a new warehouse to facilitate logistics and the order fulfillment process. It is exclusively for finished goods inventory. The new warehouse also serves some of our vital customers who demand a just-in-time delivery system.



New METYCORE Line



Warehouse



Carbon Loom

## RTM Training in Istanbul



Hands-on training - top mold lamination

For the fifth consecutive year, METYX Composites organized and hosted a comprehensive RTM training in Istanbul, Turkey November 4-6, 2010. Based on high demand for more industry knowledge in Turkey and the surrounding region, the three day event was filled to capacity. In attendance were 45 participants and presenters representing 13 different countries throughout Europe and the Middle East. The

venue where the event took place was the Via Hotel, a beautiful 5 Star luxury hotel.

The RTM training was led by Co-directors, Richard Bland and Stephen Williams of Composite Integration®, a METYX Composites partner. Composite Integration provides practical technical support and consultancy in all aspects of closed mold processing and is world re-

nowned for their industry expertise.

The targeted RTM content included both theory and hands-on practice, which is a key differentiating factor true of all METYX Composites trainings. Attendees discovered the latest innovations in RTM technology, enabling a quick start for new-comers and advanced techniques for those familiar with the process.



Completion of four RTM molds



Theoretical session of the RTM training

### The course covered the following content areas:

- Component design for process
- Pattern design and preparation
- Mold construction
- Mold building materials
- Calibration wax
- Vacuum equipment and its application
- Mold sealing systems
- Injection/vent insert application
- Molded inserts
- Injection materials
- Release agents
- Injection strategies
- Vacuum for injection and clamping purposes
- Injection equipment

Simultaneous Turkish/English translation was provided. There were also no restrictions on attendees photographing and videotaping the event.

As the composites industry continues to evolve in Turkey, METYX Composites will remain committed to disseminating industry knowledge in the region in the form of RTM trainings as well as the company's signature event, a Biennial Composites Summit, the next of which will be held in June 2011.

## Seminars Abroad

Continuing the commitment to disseminating composites expertise in Turkey and abroad, the METYX Composites team presented at events in several geographic regions this year. Presenters included industry leaders from across the globe.

### Reinforced Plastics International Balaton Conference

Heszthely, Hungary  
May 18-20, 2010



Reinforced Plastics International Balaton Conference

### Kompozyt-Expo – Composites, Technology, and Machines for the Production of Composite Materials Trade Fair

Krakow, Poland  
November 25-26, 2010



Kompozyt-Expo

## Trade Shows

METYX Composites was an exhibitor at the following trade shows in 2010:

- **JEC Composites Show**  
*Paris, France – April 13-15, 2010*
- **KompolST**  
*Istanbul, Turkey – June 10-13, 2010*
- **HUSUM WindEnergy**  
*Husum, Germany – September 21-25, 2010*
- **JEC Asia**  
*Singapore – October 12-14, 2010*
- **Feiplar**  
*Sao Paulo, Brazil – November 10-12, 2010*
- **METS**  
*Amsterdam, Holland – November 17-19, 2010*
- **Polymeric Composites Symposium**  
*Izmir, Turkey – November 26-28, 2010*

The METYX Composites team looks forward to meeting you at the following trade shows in 2011:

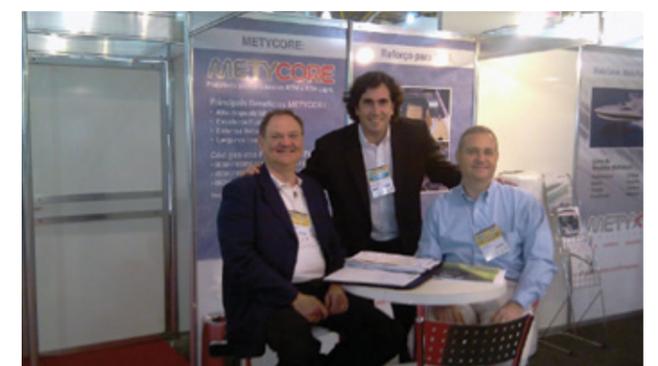
- **Composites 2011**  
*Fort Lauderdale, FL, USA – February 2-4, 2011*
- **International Symposium on Composites RTM**  
*Saint-Avold, France – February 9-10, 2011*
- **JEC Composites Show**  
*Paris, France – March 29-31, 2011*
- **JEC Asia**  
*Singapore – October 18-20, 2011*
- **METS**  
*Amsterdam, Holland – November 15-17, 2011*



METS



JEC Asia



Feiplar

## Our Partners

METYX Composites welcomes Farecla® to our global network of partners. Farecla of England produces a world-class range of surface finishing compounds that add luster and brilliance to various surfaces, particularly within the automotive and marine industries. Their trailblazing paint technologies and market-leading solutions have been valued by prominent customers from around the globe since 1953. The METYX Composites team is proud to offer their full line of exceptional products to our customers.

METYX Composites is pleased to offer a full portfolio of superior composites distribution products from our world-renowned partners.

 Continuous Filament Mat (Belgium)	 PVC Foams and PET Foams (Switzerland) Balsa Core Materials (USA)	 Amorim Cork Composites, S.A. Amorim Cork Composites (Portugal)
 Mold Releases and Process Additives (USA)	 RTM Equipment and Tooling Materials (UK)	 Plug and Mold Repair and Surfacing Materials (USA)
 Surface Finishing Compounds (England)	 Epoxy Systems (USA)	 Enriching lives through innovation Epoxy Systems (Switzerland)
 Tooling Resins and Gel Coats (France)	 Vacuum Infusion Materials and Technology Consulting (UK)	 Cleaners/Resin Separation Technology (Holland)
 Gel Coats, Resins, and Structural Adhesives (UK and UAE)	 PP Honeycomb Materials (Germany)	

## Our Distributors

METYX Composites is proud to welcome Plaquimet® and Composites Brasil® to our distributor network.



Plaquimet, headquartered in Buenos Aires, Argentina has been producing unsaturated polyester resins, gel coats, and polyurethane systems since 1979. The company is currently the second largest resin producer in Argentina and has a strong financial background. Composites Brasil, part of the Plaquimet group, is located in Sao Paulo, Brazil. The company concentrates its efforts on polyester resin technology for the composites industry. They also distribute glass fiber and other composites related products. METYX Composites will continue to work on business development in both Argentina and Brazil with the expertise of these strong partners.

METYX Composites technical textiles are now distributed in over 20 countries. The following companies comprise our expanding global distributor network.

 C-L Sp.Z o.o. • Poland	 Modest Marketing • United Arab Emirates	 Polyfiber • Iran
 Composites Brasil • Brazil	 Novia Kft. • Hungary	 Scott Bader • France, Ireland, and UK
 Decatlo • Portugal	 Plaquimet • Argentina	 ETC • Russia
 Lavender • Australia	 POLYchem • Austria, Bosnia, Bulgaria, Croatia, Czech Republic, Montenegro, Romania, Serbia, Slovak Republic, and Slovenia	

## Azuree 40 and 33

### A Sailing Enthusiast's Dream Come True

Globally recognized for their innovative boats, Sirena Marine® of Istanbul, Turkey is the only production partner of the Azimut Benetti Group outside Italy since 2006. The Azuree line is the latest offering of this prestigious team of Turkish and Italian designers and engineers.

Azuree 40, the first boat of the line was nominated as one of the five finalists for the European Yacht of the Year Award in the Performance-Cruiser category in February 2010. The second model in the Azuree family, Azuree 33, was launched in October 2010 and immediately received rave reviews regarding its groundbreaking approach to performance-cruising.

The concept behind the line is to deliver the ideal performance cruiser yacht to the sailing world. Azuree targets cruiser enthusiasts with its comfort, luxury, and unmatched space on-board while simultaneously appealing to performance lovers with its aggressive hull design. Both Azuree 40 and Azuree 33 are available in cruiser and fast cruiser versions.

Azuree 33 is built with the most advanced boat-building technologies. The hull and deck is built with vacuum infusion technology, fully sandwiched. Vinylester is the resin of choice. The entire structural frame (spider frame) is reinforced with carbon and a carbon-hybrid. The end result is a powerful structure that dis-



tributes all loads effectively from the keel and rig. Azuree 33 is not only one of the most attractive and inventive boats in its segment but also one of the best built.

METYX Composites supplied all the reinforcement materials for the Azuree line. Regarding the build, Tunc Ustunel, Sales and Marketing Director, METYX Composites explained, "The Azuree series boats have unique structural advantages such as a carbon and e-glass hybrid hull and deck structures for improved performance. The vacuum infused sandwich structure of the boat is the work of a highly experienced production team. They have been using custom infusion grade METYX Composites reinforcements in the Azimut range boats for over three years now."

"We believe Azuree boats will enjoy continued success in the years to come thanks to the professionalism and dedication of the Sirena Marine team. We share their enthusiasm and look forward to working with them in the future," concluded Tunc Ustunel.

## Oyster 125

### Record-breaking Infusion

World renowned Oyster Yachts® continues its partnership with RMK Yachts® of KOC Holding in Istanbul, Turkey. The company's second super yacht, OM 125, has been the center of local and international media attention since its launch due to its size and structural complexity.

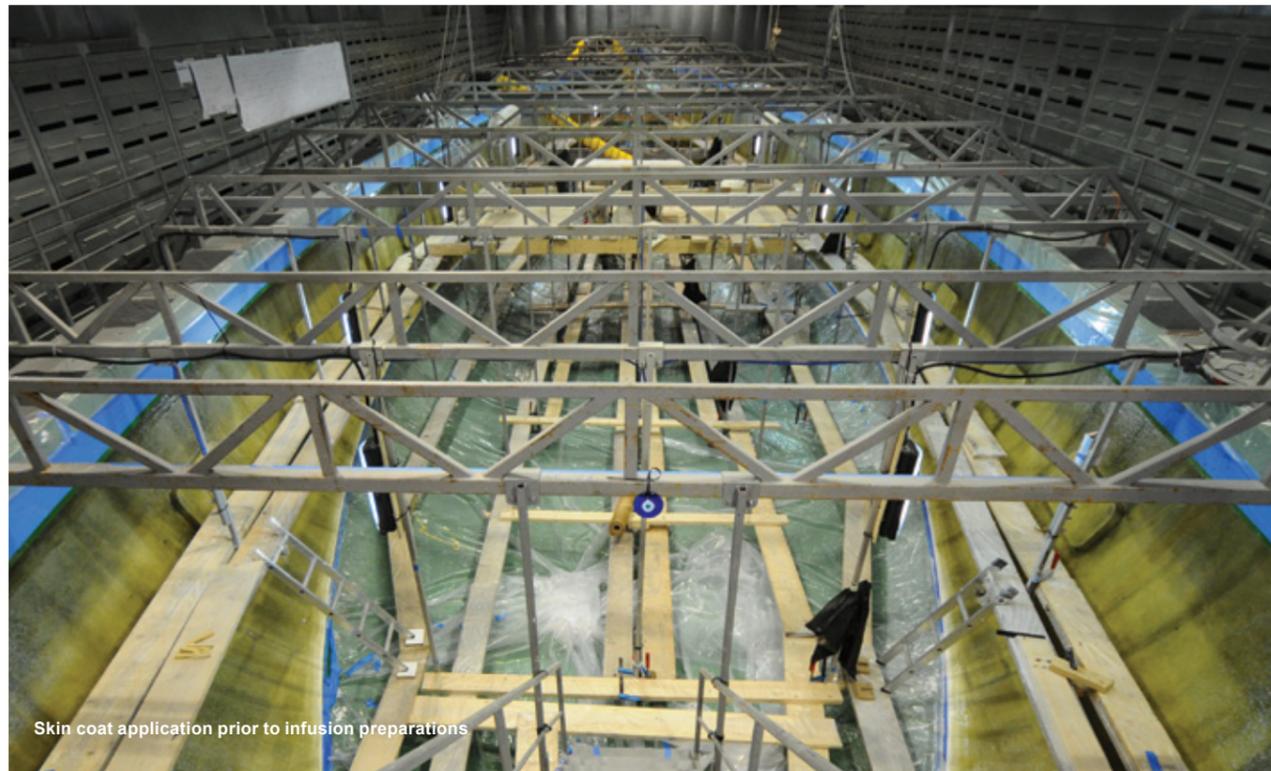
Oyster 125 is the largest one shot infusion to date and is currently pending approval with Guinness World Records. The massive infusion of the hull structure required 6,300 kg

of VE resin; 11,000 kg of METYX Composites e-glass, carbon, and aramid reinforcements; and 3,000 kg of balsa core materials from 3A Composites (formerly known as Airex/Baltek).

The hull surface was 480 square meters and the vertical drop was 5.9 meters, both of which constituted serious challenges for everyone involved. The METYX Composites team was present during the infusion and was impressed with how the intense planning work resulted in such precision of execution.

"We are proud of our ongoing relationship with Oyster Yachts and are happy to continue to be part of their success," stated Bahattin Sendogan, Sales Leader, METYX Composites.

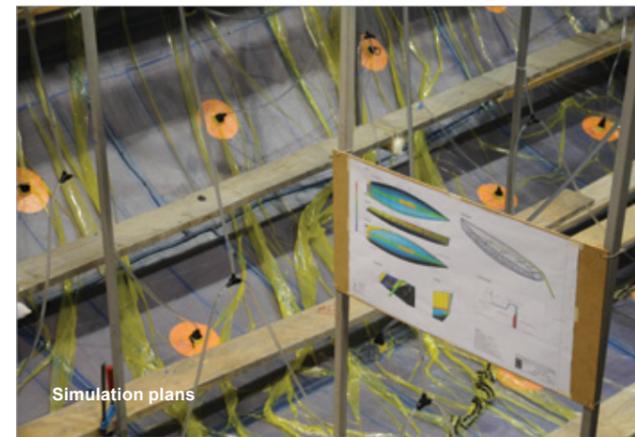
Composites Production Manager, T. Emek Gokkaya, commented, "METYX Composites was great help in fine tuning the permeability of the reinforcement stack and also in developing a set of custom reinforcements to fit our specific needs. We hope to continue our partnership with them as we embark on new challenges."



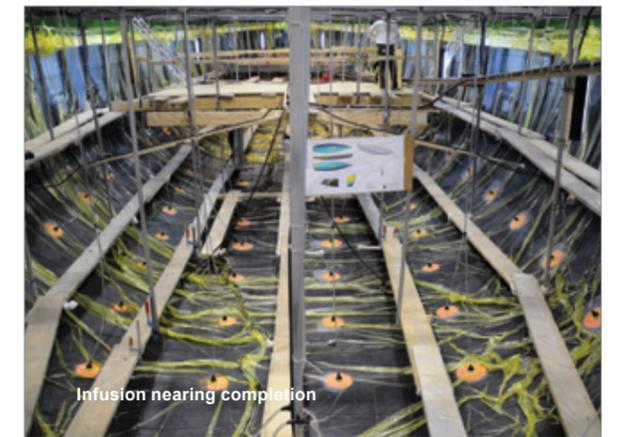
Skin coat application prior to infusion preparations



Infusion preparations completed



Simulation plans



Infusion nearing completion

## Setmarin®



Likia 40



Likia 40

### The Union of Classic Design and Modern Technology

Setmarin of Istanbul, Turkey had the vision of producing a unique sailboat. The notion behind this boat, Likia 40, was to combine the best of classical design with the most modern of materials and technology.

The boat's designer, Turhan Soyaslan, decided to use FRP rather than wood and other traditional types of materials used to build classic boats. The company chose METYX Composites biaxial and unidirectional reinforcements for the monolithic hull lamination. The deck was a sandwich structure. The core material was marine grade plywood bonded with Crystic's 80-96 via vacuum infusion. Crystic 1181A was used for bonding the deck, and Crystic 1152PA was used for the bulkhead.

"METYX Composites supplied the full suite of products. More importantly, they helped us select the most suitable materials for the project and guided us in their application," commented Sinan Toygar, Technical Manager, Setmarin.

The interior of the boat, designed by Aleks Banakis, reflects more classical materials, true to the vision for the project. The interior finish of the boat is wood and laminated veneer. Two designs are available—one and two cabin versions with variations for the galley, heads, and navigation table.

The equipment chosen for the navigation, running and standing rigging, plumbing, and electrical are all well known brands with service points all over the world. The production was controlled by the Dutch Certification Institute, and Likia 40 has CE certificate category A-unlimited ocean voyages.

Mr. Togar concludes, "I would like to thank the METYX Composites team for their support and technical assistance. Even though we are a small customer, we received their utmost attention."

## Lightweight Structures®



Composite Pedestrian Bridge - Heerlen, Netherlands

### Composite Pedestrian Bridge

Civil engineering is no longer limited to the traditional use of concrete, steel, or wood. Glass fiber reinforced materials serve as an innovative alternative for decks of bridges—especially foot bridges. These composite bridges offer advantages that include enhanced performance, reduced maintenance, and significant savings in total life-cycle costs.

Lightweight Structure of the Nether-

lands is a company that focuses on creative product development, engineering, and manufacturing of lightweight structures. They have over 15 years of expertise in this area. Recently the company produced a composite bridge deck using METYX Composites glass fabrics for the municipality of Heerlen in the Netherlands. Aldert Verheus, CEO, Lightweight Structures commented, "We are pleased with the service and quality METYX Composites consistently delivers. We are also

impressed with the permeability of their custom reinforcements, which is key for the successful infusion of the bridge's deck structures."

Lightweight Structures aims to inspire architects and engineers to make use of the full potential of GFRP and vacuum infusion technology. Their vision is well underway in the municipality of Heerlen where they have already commissioned a second bridge with a composite deck.

## Fish Farm

### Revolutionizing the Industry with L-RTM

Karl Mula (formerly of Mulasan®) is a composites consultant and world renowned RTM expert in the marine and automotive sectors. He is also a longtime METYX Composites friend, client, and partner. Abandoning his plans to retire two years ago for new adventures, Mr. Mula embarked on

an exciting composites project in the mountain area of Elazig in Eastern Turkey where he started the region's first Closed Molding Workshop.

METYX Composites has been collaborating with Karl Mula and his team on this effort in terms of materials and expertise. "We are proud to report that the workshop now

successfully produces trout breeding tanks and farm cages both with L-RTM and vacuum infusion. Hundreds of tanks and farm cages have been produced and placed in the field with high demand for more," stated Ugur Ustunel, VP New Business Development, METYX Composites.

In the past, others have attempted to build composite fish farms out of polyester by means of hand layup. The main disadvantages were height, weight, and high flexibility bulge on all surfaces, as well as a low surface quality. L-RTM and vacuum infusion methods address these issues and produce outstanding results.

After considering the various demands of producing a trout breeding tank, an ideal model was built, and L-RTM molds were taken from it. Vacuum seals were supplied by METYX Composites. The layup consisted of 0/90° and +/-45° METYX biaxial fabrics as well as METYCORE reinforcements. The fill time for the 8.2 square meters part was 27 minutes. After a light post curing at 70° Celsius for two hours, a cycle time of six hours was reached.

Building the trout cages presented another set of requirements and related issues. The trout cages used

locally are usually square and constructed of iron. They often have old and used plastic containers containing chemicals attached to them for flotation. The disadvantages to this type of construction are many. Firstly, since fish always swim in a circular motion inside a confined space, the corners of a square cage are never used resulting in a lower fish capacity. Secondly, angle iron construction materials rust and become unusable after five years. The cages

also often break at their welding joints, which can result in a total loss of fish. Next, the used plastic containers often crack releasing remains of chemical contents into the river. Finally, this type of construction has a narrow walkway on top of the cages, which presents a significant danger for working personnel.

To rectify these issues with a design solution that address the requirements properly, the Karl Mula/

METYX Composites team constructed a trout cage with the following properties:

- Hexagonal shape so that the whole area can be used.
- NPG gel coat and polyester construction for durability and ease of cleaning
- Wider 70 cm walkway with an anti-slip surface.

A mold for each six meter section was built. Both ends are closed, and there are two integrated bulkheads one third from each end. The parts are bolted together onsite. All bolt holes are pre-marked on the mold and are above the waterline. Each segment has a total area of 13.2 square meters and weighs only 52 kg with a volume of 700 liters, which means that the total carrying capacity of one cage is 4,900 kg.

Mr. Mula commented, "We are excited that our new composites factory based completely on L-RTM and infusion is now producing 12 meter parts and that our end products have been successful." Mr. Mula introduced the composites industry to Elazig, where the factory is located. "The people there refer to multiaxial reinforcements as 'METYX fibers' there now," added Mr. Mula.



Modular breeding tanks in Keban lake



A single hexagonal tank with anti-slip surface



Layup of METYX Composites fabrics into the L-RTM mold

**Polin®**

**Transforming Waterparks with RTM**

With over 34 years of experience and more than 1,500 completed projects in the composites sector, Polin of Istanbul, Turkey is also the first European waterslide manufacturer to use RTM technology in waterslide production. In fact, the company produces the world's largest waterslide components using RTM technology. What prompted Polin's switch to RTM were the significant advantages to the end customer over conventional layup and spray

methods. Some of these benefits include: an aesthetically superior product (shinier and smoother surfaces with homogeneous thickness distribution); stronger and lighter waterslides; easier installation; and improved environmental responsibility through lower styrene emission and reduced physical waste.

Polin's latest venture is a revolutionary, patent pending waterslide named King Cobra, an innovative slide that features two double tubes configured side by side along a circular path. It



King Cobra Rendering

offers one of the most intense riding experiences in the industry. The wa-



Aquasplash Marineland, France



Golden Bay Gelindgik, Russia

terslide is also proving to be the number one attraction at waterparks in terms of visual impact and spectator appeal. With its unique design configuration, fiberglass theming, striped coloring, and distinctive riding path, King Cobra creates a truly exceptional experience both for the riders and spectators alike.

To bring life to their vision of a groundbreaking waterslide, Polin chose METYX Composites METYCORE MAX™ as the reinforcement fabric due to its maximized flow rate and

speed in RTM applications. METYX Composites further customized the product to obtain the highest flow rate for fastest processing specific to Polin's waterslide applications.

METYCORE MAX is a mechanically stitch-bonded sandwich type reinforcement developed for RTM and infusion process. It consists of three layers: a three-dimensional core which is sandwiched between two layers of chopped strand mat. The engineered core helps the resin traverse the laminate with maximum

speed and precision while conforming well to the shape of the mold. The benefit of this high flow rate is specifically attributed to the 3D weave in METYCORE MAX, which is much faster than the standard METYCORE product that is produced as a classic synthetic nonwoven. METYCORE MAX is ideal for series production, large scale projects, products where highly filled resin systems are needed, and flame retardant applications (like those often required in the transportation industry).

## Classic Sports Car

### Revival Design Meets Modern Technology

Ozgur Tan, a Mechanical Engineer with over 20 years of experience in the automotive sector, united with other industry professionals and fellow race car enthusiasts to form a group of specialist builders. Their goal was to build a sports car with a classic design. Few groups have the ability to build the revival style they had in mind.

The design that the group was most passionate about is called Barchetta, meaning "little boat" in Italian. It is a two-seater open style from the 1940's and 1950's used in cult classics like Siata 300BC, Barchetta Sport Spider, Siata 208S Spyder, Ferrari 166 Mille Miglia, and AC/Shelby 289 Cobra. A Barchetta is built for racing. It focuses on performance. Weight is kept to a minimum by eliminating unnecessary equipment and adornment, including bumpers, doors, weather equipment.

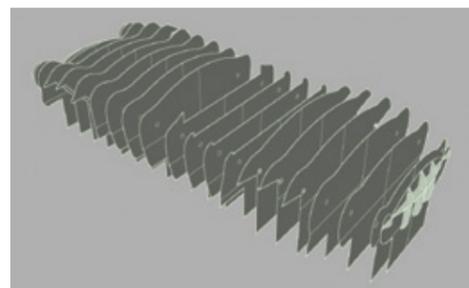
Although Barchettas are typically handmade out of aluminum on a tubular frame, Mr. Tan and his group decided to upgrade the materials to composites because they are lightweight, durable, and not prone to corrosion. For the composite body, they chose METYX Composites multiax-



Finished Race Car

ial aramid fabrics due to their strength and impact resistance. The plug was prepared from MDF sections, and then five molds were produced to comprise the body.

For the engine the group chose a GM Goodwrench V8 5700c, which delivers 290hp to a small car that weighs only 1,300 kg. True to Mr. Tan's vision and to the Barchetta style itself, the vehicle they produced is undoubtedly a performance race car.



Race Car Renderings

## Turkish National Water Polo Teams



2010 Turkish Water Polo Senior Team and Federation Officials

### Rising Stars

In the tradition of supporting programs that inspire youth, METYX Composites continue to be a proud corporate sponsor of the Turkish National Water Polo Teams. The Junior and Senior Teams showcase some of the most talented emerging water polo players in the sport today.

2010 was one of the greatest years ever for the Turkish National Water Polo teams. The Senior Team succeeded in qualifying for the European A Championship for the first time ever, beating several strong rivals including Slovakia and Malta in the qualification round.

The European Championship games

were held in Zagreb, Croatia in August 2010. Zagreb hosted 12 teams, eight of which qualified for the 2008 Olympic Games in Beijing.

The new goal for the Senior Team is to qualify for the next European Championship to be held in Eindhoven, Netherlands. They aim to improve on last year's results in order to be a candidate in the qualifications for the 2012 Olympic Games in London.

The METYX Composites team is honored to support such exemplary sportsmen and to be part of their journey toward the Olympics.



Action shot