

# CHOMARAT News...

July/August 2016 - n°4

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CHOMARAT

free to innovate

## Agenda

### **China Composites Expo**

Shanghai - China  
31-2 septembre 2016

### **Spe Automotive**

Composites Conference &  
Exhibition (ACCE)  
Novi  
7-9 septembre 2016

### **Experience Composites**

Ausburg - Allemagne  
21-23 septembre 2016

### **CAMX**

Anaheim, CA - USA  
26-29 septembre 2016

### **Airtec**

Frankfurt - Allemagne  
25-27 octobre 2016

### **Advanced Engineering**

Birmingham - UK  
2-3 novembre 2016

### **Jec Asia**

Singapour - Asia  
15-17 novembre 2016

## Automotive composites: a future market for Chomarar

The Chomarar Group is developing an ambitious strategic vision, preempting evolutions and changing requirements in our environment. This vision covers technological aspects, products and industrial organization. The Group's strategic vision of the automotive industry is part of this outlook. In order to fulfill regulatory objectives to reduce CO<sub>2</sub>, the automotive industry needs to rethink its strategy and must innovate. Continuous glass and carbon fiber composites offer a significant advantage in attaining these goals, by enabling the weight of structures to be reduced.

In order for composite products to make their mark, they must be of economic benefit in a context where each process and each material must compete to find its place in an appropriate and optimized industrial procedure.

Chomarar has developed various solutions that offer structural reinforcement optimized in terms of weight and orientation, as well as solutions that take appearance into account for applications with high quality standards. Chomarar's European composites sites have obtained ISO/TS 16949 certification.

Our ability to adapt and develop technologies and our long-term strategic vision upheld by strong partnerships have enabled us to become a major player in composites for the automotive industry.

We apply the same approach in other sectors, ranging from construction to sports and recreation, as you will see in this newsletter.

Happy reading!



*Francisco De Oliveira*  
Manager Automotive Market

## How can a "Class A" surface appearance be achieved on automotive parts made of composite materials?

*The Chomarat research center posed this very question and the initial conclusions of its study demonstrate that it is possible to considerably improve the appearance of bodywork parts manufactured using resin transfer molding (RTM).*

### The automotive industry challenge

The reduction of automotive CO2 emissions is an important objective and major challenge for this sector. One way of reducing emissions is to use composite materials. However, it can be more difficult to obtain a "Class A" surface appearance using composites, as they present a greater number of variables than simple materials such as steel or aluminum. Reinforcement fiber, such as carbon, which offers a rigidity-to-weight ratio greater than that of steel or aluminum, can result in a visible pattern that is unacceptable on a finished part with a Class A rating.

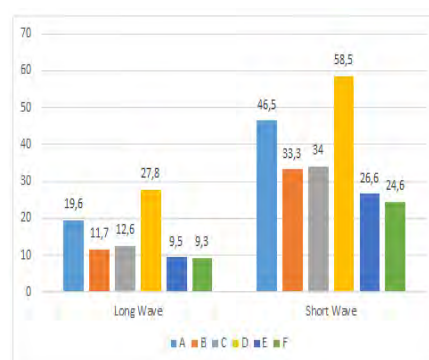
### Impact of reinforcement on surface appearance

The purpose of the study conducted by the Chomarat team was to assess the impact of carbon multi-axial reinforcement (C-PLY™) on the surface appearance of bodywork parts manufactured using RTM, so as to provide customers with an optimized solution.

Tests were performed on unpainted parts, made in a block finish

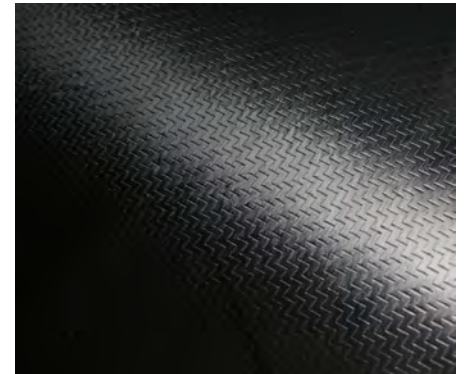
mold. The surface appearance was evaluated using Wave-Scan, a measurement instrument that simulates human vision.

The first phase of the study entailed ascertaining the impact on surface appearance of each factor, taken in isolation, involved in creating a non-crimp fabric (NCF). This part of the study highlighted the influence of factors such as stitching, bonding tension and the use of surface webbing or screens on the appearance of parts made with NCFs. At the same time, we also assessed the impact of thermal aging on the Wave-Scan values.



*Impact of the sewing on the aspect*

The second part of the study was dedicated to the impact on sur-



*Carbon laminate realized with C-PLY™ before painting*

face appearance of layering NCFs. An analysis based on a typical (quasi-isotropic) laminate made it possible to show the impact of each layer (direction, type, etc.) on the overall appearance of the part before and after thermal aging. The next stage in the study will entail establishing a correlation between the results obtained on the samples with measurements taken on painted parts.

*For more information on the study or a customized analysis, please contact us at: [info@chomarat.com](mailto:info@chomarat.com)*



## Chomarat's coatings and films business boosted by a new technology

*In keeping with the Group's development strategy, Chomarat is investing in a new varnishing line for the automotive market.*

### Purpose of varnishing

An essential aspect of our business, varnishing consists of depositing surface layers intended to confer mechanical properties (abrasion, flexion, etc.) and chemical resistance, to change the tactile properties of the surface, and to add certain effects (matte, gloss, pearlescent, etc.) to meet the needs of designers and fulfill perceived quality and customization objectives.



*Varnishing line being installed*

**The new machine will supplement and complement the industrial equipment already installed at the Chomarat France site.**

The purpose of this investment, which will serve to finish coated materials, is to remain competitive while preserving the environment.

With this new equipment designed for aqueous phases, Chomarat is preempting changes to REACH regulations and is pursuing its environmental policy aiming to eliminate the use of solvent-phase varnishes in the medium term.

The coating technologies used on this line are intended to eliminate, as far as possible, the presence of volatile organic compounds in the various chemical formulations used, and thus to fulfill more strin-

gent future requirements within the automotive industry.

### New designs to OSKIN™ range

The new equipment also offers the ability to adjust the thickness of the coating (from a few microns to opaque color) to create new and high-quality surface appearances.



*OSKIN™*

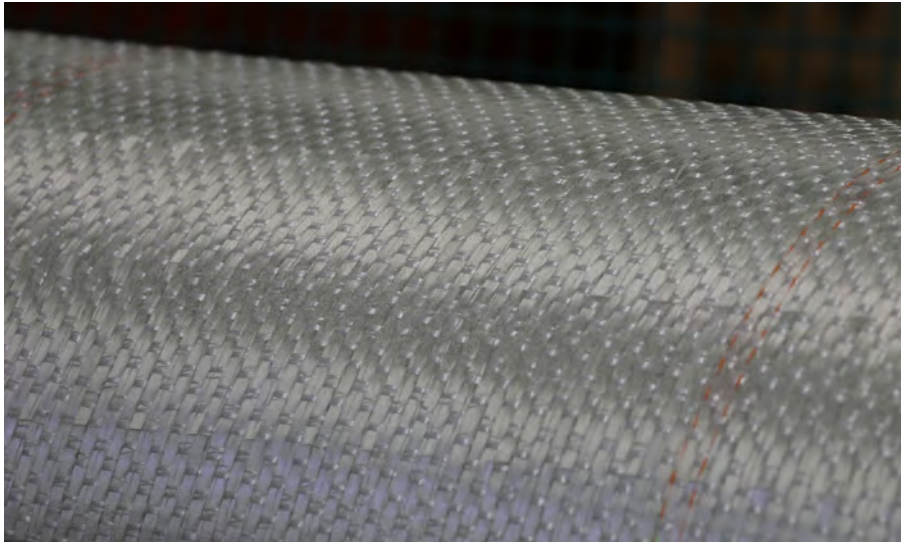
It is an essential asset in the development of our thermoplastic olefin (TPO) solutions, which characterize our **OSKIN™** range.

The **OSKIN™** range, specially designed for automotive interior trims, puts this technology to full use for dashboard, door panel and floor-level parts.

The facility has been installed at the French site and production is scheduled to start in early 2017.

## ROVICUT™, the first stretchable woven reinforcement for pipe rehabilitation

*In collaboration with Reline Europe, a leading manufacturer of liners for trenchless pipe rehabilitation (CIPP), Chomarar has developed ROVICUT™, a patented reinforcement unlike any other on the market.*



ROVICUT™

### Strenghts of CIPP

Cured-in-place-pipe (CIPP) is a tried and tested pipe rehabilitation method. It enables pipes to be repaired without opening a trench, creating noise pollution and dirt, or disrupting traffic flow. It is a reliable, economic and long-lasting solution.

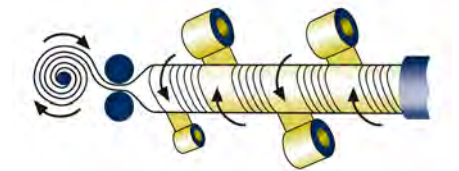
### Advantages of ROVICUT™

ROVICUT™ came into being in 2010, in response to a special request from Reline Europe, which was looking for a stretchable fabric. Chomarar thus designed a glass fiber fabric whose warp threads are cut at regular intervals. The fabric offers guaranteed performance in the 0° and 90° directions, with the cuts providing elongation.

ROVICUT™ has been specially designed for Reline's new Alpha-liner 1800 range, dedicated to large-diameter pipes. With its ability to stretch, ROVICUT™ molds seamlessly to the shape of worn pipework, making it possible to achieve significant mechanical characteristics without adding excess thickness to the liner. Optimization of the thickness of the liner reduces the weight, resulting in easier and quicker handling and installation in terms of UV curing, in turn leading to attractive cost savings.

### Pipe rehabilitation steps:

ROVICUT™ is coated with resin, rolled on to a tube of the desired diameter, and film-wrapped. The pipes are inspected and then cleaned. The liner is installed in the



ROVICUT™ is coated with resin and rolled onto a tube

pipes, cured using UV lamps, and then inspected using a camera.



The liner is inserted into the pipes

For more information on installation:

<https://youtu.be/y75pl4zf0qw>

# SUCCESS STORY

## A full carbon light sport aircraft designed with passion and C-PLY™

*The first airplane designed within NASHERO is a two-seat full carbon light sport aircraft with low fuel consumption, extremely low environmental impact, less emission than hybrid automobiles, and high-end safety features.*

*“The NASHERO aircraft are focused on the following precepts: Safety, Efficiency, Quality and Comfort and are superior to any existing light aircraft when compared with the above key features. The NASHERO aircraft has safety features that are not currently required by the certification agencies for light aircraft certification. Additionally, the aircraft can hold two large adults with baggage without making them touch their shoulders. The aircraft are extremely durable since, unlike most current aircraft which are made using wet-preg and hand layup, NASHERO aircraft are made by our proprietary vacuum infusion process. Our proprietary technology allows us to make a very stiff, lightweight, carbon composite structure with consistent high quality, almost the lowest void content in the composites industry, and a controlled fiber volume fraction. This results in high speed aircraft which is resistant to fatigue and flutter.”* explains Naresh Sharma

The choice of material and fabrication technique was critical to achieve the desired performance.

*“Our aircraft is currently designed with two different carbon multi-axial fabrics from Chomarat, one is 150gm biaxial and the other, 100gm UD. We use C-PLY™ for*

*three reasons:*

- *Ease of handling. Dry C-PLY™ is very easy to layup compared to the other dry spread-tow technology material we were using.*
- *C-PLY™ allows the layup with minimum crimp, thus enhancing the structural quality of the part compared to plain or twill material.*
- *The very low areal weight C-PLY™ allows us to tailor the material properties with structural requirements very closely.”* says Naresh Sharma

NASHERO is currently finishing the prototype of its first aircraft; this will be put into series production soon. Additionally, their USA distributor for composite services is supplying high end carbon composite parts to customers in Aerospace and high precision US industries made by NASHERO in Italy.

“We are full of hope for the future and even if, currently, we are a very small company, we will be hiring, shortly after the first flight of the plane, many people to come aboard. We’ll be training our new team with the patent-pending technology to enable serial production of our aircraft. We’re very pleased with the relationship with our Americas distributor, R&M Int., of Fort Washington PA, USA, through whom we have

begun supplying extremely high end composite parts to some US based companies.” concludes Naresh Sharma



*Dr. Naresh Sharma  
CEO of NASHERO*

*Naresh Sharma has a Ph.D. degree in Aeronautical Engineering from TU Delft. His idea was to design and build his own airplane to travel around the world. His aircraft designs generated many orders from the inception and that made him start his company. He started NASHERO, a small aerospace company, based in Italy, in 2010.*

*For more information :  
[www.nashero.com](http://www.nashero.com)*



## DIAGOTEX™

### The key to high-quality development

*Völkl was founded in Bavaria in 1884 and has been producing skis since 1923. It is one of the last remaining manufacturers still developing and producing skis in Germany. The main Völkl plant, located in Straubing, is among the most modern ski production sites in the world and is synonymous with “Made in Germany” technology and quality.*

Every day, the 400-strong workforce produces between 1000 and 2000 skis, and up to 300 models are developed each year, with the single aim of providing the best ski for each type of skier.



*“The development of innovative ski designs is just as important as achieving the highest level of quality”, explains Tobias Heil, R&D Director at Völkl Sports. The challenge in designing a ski is to reduce the weight without compromising on quality or performance. To achieve this goal, Völkl has had to switch from glass fiber to carbon fiber. Tobias Heil found the solution*

at Chomarat, one of Völkl’s long-standing suppliers, in the form of a special carbon reinforcement product called **DIAGOTEX™**.

The carbon fiber increases the tensile strength while enabling the weight of the ski to be reduced, and the **DIAGOTEX™** construction ensures an equal distribution of the carbon fibers at an angle calculated to avoid torsion. The result is lightweight touring skis that offer fantastic behavior on snow and an original and attractive appearance.

*“The use of **DIAGOTEX™** in our skis offers a perfect balance between lightweight construction and behavior on snow. Torsional rigidity is increased significantly, without any impact on longitudinal rigidity, creating a very flexible ski without loss of adhesion or stability both on- and off-piste. We were able to reduce the weight of a very wide ski (109 mm) by nearly 20% without loss of performance on the snow. We have more than 10 models incorporating **DIAGOTEX™** Carbon. The newest product in the Völkl range to benefit from the addition of **DIAGOTEX™** Carbon is the VTA 80 Lite, which weighs in at less than 1000 g”, says Tobias Heil.*

This development is the result of a long-term relationship between our two companies, combined with an innovation-oriented philosophy.

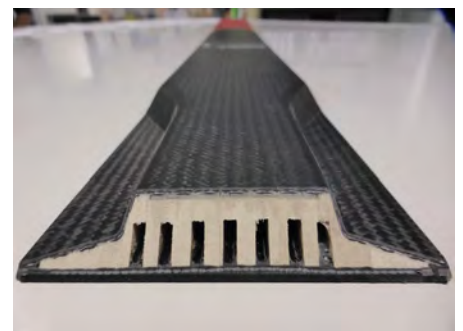
*“Chomarat understands the need to offer new materials and their proactive product development has culminated in a combined success”, emphasizes Tobias Heil.*



*Tobias Heil, Director R&D, Völkl Sports*

#### Advantages of DIAGOTEX™

- Equal distribution of fibers
- Defined angles
- No gaps
- No torsion
- Attractive appearance

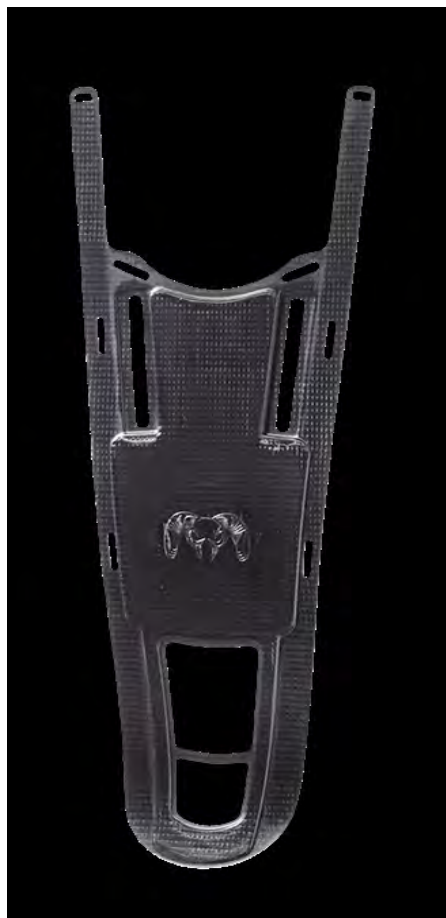


*Section of a ski*

## Rocket Composites innovates with C-PLY™



Paul Hewitt, owner and founder of Rocket Composites, got his start working with composites in the early 90's making high-end windsurf boards in his native California. A pioneer in the use of woven carbon fabrics to make lighter and stiffer windsurf boards, Paul became a proponent of the benefits that carbon fiber delivers in composites. Later, his company specialized in making high performance drum shells. Rocket's drum shells were known for their acoustic consistency and light weight, key benefits for marching band members.



Backpack frame designed with C-PLY™

For the past few years, Rocket has been making an all carbon backpack frame for their customer KUIU, a maker of ultralight hunting gear. Paul said his company's value to KUIU is the ability to move rapidly through all phases of product development; concept, design, tooling, prototyping and

production. Depending on the part, this can all take place in just a few weeks.

Originally, Rocket relied on woven carbon materials comprising two angles. In 2014, Paul became aware of the collaboration between world renowned composites expert Stephen Tsai, Emeritus Professor, Stanford University and Chomarat to bring a new kind of carbon reinforcement to reality. This new material is a carbon multi-axial fabric that utilizes spread tows, thin plies, no crimp and shallow angles, Chomarat calls its product range C-PLY™.

Working with Chomarat and Professor Tsai, Rocket Composites was able to redesign the backpack frame utilizing a custom triaxial C-PLY™ fabric that is 25% stronger with much better torsional stability compared to previous models made from traditional woven carbon fabrics. Paul states that C-PLY™ makes a flatter and more stable part. It handles and cuts better than woven fabric and generates less waste.

Rocket also designed and manufactured their own tooling for the frame, and parts are made using a compression molding process.

Chomarat will feature the newly



KUIU Backpack

launched KUIU ULTRA backpack frame at the CAMX 2016 show in Anaheim, California September 27th – 29th. Come see us at booth P40.

John Leatham, Sales Director,  
Chomarat North America





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