

CHOMARAT News...

No. 7 - June 2019



CHOMARAT

free to innovate

Contents

EDITORIAL

2. Preparing for the future

TRENDS

3. Chomarat takes corporate responsibility further

FOCUS

4-5. Chomarat France: feedback on recent investments

INNOVATION

6. A new line dedicated to the development of laid scrim reinforcements for the construction market

SUCCESS STORIES

7. Chomarat carbon reinforcements, selected by the most demanding prepreg suppliers

8. ROTATEX™ reinforces Siniat's SECURTEX® attack-resistant plasterboard

9. The new Babolat Pure Aero: legendary spin and power, increased control and feel

MARKET

10. Riding the waves with the boating sector

Preparing for the future

As our environment constantly changes, we face new ecological, technological and economic challenges. Chomarat anticipates these challenges and turns them into opportunities. Our clients feed our thinking and stimulate our creativity.

Partnerships are developed and strengthened from day to day. Relations with some partners stretch back for decades, while for others the adventure has only just begun. But they all have one thing in common: their commitment to innovation, proximity and quality.

To develop tomorrow's materials and build the future, we are investing in research and transforming our industrial facilities.

Preparing for the future also means committing to a responsible approach. We help cut the carbon footprint of vehicles by offering weight reduction solutions. We develop interior trim for automobiles, made of recyclable materials. We contribute to cutting VOC emissions in composite workshops by developing solutions for closed mold processes (infusion, RTM, Light RTM). We also play a role in the transformation of construction materials, which are becoming intelligent and multifunctional.

In this new edition of Chomarat News, we are very proud to present examples of our achievements, reflecting our passion for our specialties and our customers.

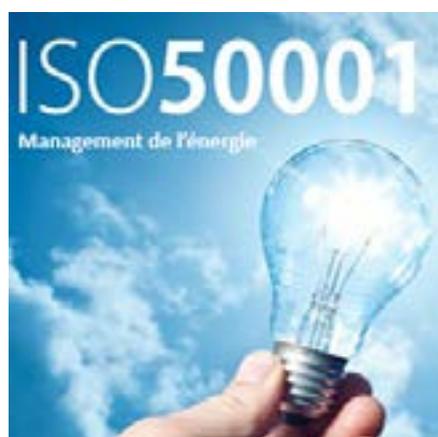


Raphaël Pleynet
Business Director
Composites and Construction
Europe

Chomarat takes corporate responsibility further

Since the end of 2018, Chomarat's French sites have been certified to both ISO 14001 and ISO 50001. These certifications, in environmental management and energy management respectively, demonstrate the Group's commitment to a responsible approach through a policy that aims to reduce environmental impacts and energy consumption, preserve natural resources and ensure the common good.

Making better use of energy



ISO 50001 certification confirms our ambition to ensure **efficient energy management, with a reduction in energy consumption and tools to face global warming.**

All this work should enable us to consume less and better. This environmental challenge also has economic implications in that we must increase our competitiveness in a context of rising prices and taxes on fossil fuels in particular.

A number of action plans have been initiated, including:

- Implementation of measurement tools and analysis of results
- Installation of new, more energy-efficient equipment
- Insulation of heating and air conditioning pipes, to reduce the consumption of fuel oil, gas and electricity

- replacement of fluorescent tubes by LED lighting

Keeping environmental impacts under control



As part of ISO 14001 certification, the Group incorporates environmental requirements throughout its management and production system.

Chomarat is committed to reducing waste, and abstractions from and emissions into the natural environment. With the 2015 version of the standard, we analyze our impact from a product life cycle perspective.

Our environmental approach therefore takes account of raw materials (origin, production conditions, etc.) and our finished products, from the cradle (design) to the grave (disposal).

To achieve these objectives, we must work with our suppliers and our customers. Purchasing must be responsible, transport optimized and eco-design principles adopted.

With these two certifications, Chomarat is taking a step further into the sustainable economy.

Chomarar France: update on current investments

In 2017, Chomarar announced a three-year, €35 million investment plan to accelerate innovation and modernize its French sites. We take a look back at this ambitious project.

Modernization of the glass reinforcement production site

Fifteen million euros have been allocated to the modernization of the Mariac plant, dedicated to the production of glass reinforcements for composite materials. New looms have been installed and workflows have been reorganized.

In addition, a multiaxial machine for the production of NCF glass (G-PLY™) was installed at the beginning of 2018 to increase our capacity and support activity in the sports equipment sector in particular.

The modernization of the site has also provided an opportunity to reduce our environmental impact. Conventional lighting has been replaced by LEDs and a more efficient heating system has been installed.

Pursue our carbon strategy

The investments made in carbon fiber reinforcements are part of a strategy initiated in 2011. Certain technologies available in Chomarar's facilities are unrivalled anywhere else in the world.

This is the case of the multiaxial carbon machine installed in 2018, which was designed for and by Chomarar on the basis of its technical expertise. The Group focuses its know-how on enhancing productivity and high-speed laying of carbon fibers. The aim is to meet the challenges of mass production in the automotive, aeronautical, industrial, marine and sports & leisure sectors. The machine is currently in



New multiaxial machine

production for C-PLY™, the Group's range of high-performance carbon multiaxial reinforcements, with in-line mesh or powder coating.

The carbon weaving production capacity has also been optimized to meet the needs of prepreg suppliers who endorse our high-quality carbon fabrics.

Increase thermoplastic film production capacity

The third part of the investment plan concerns the Coatings & Films activity and entails increasing production capacity and developing more efficient solutions, particularly for TPOs (thermoplastic polyolefins). Following the acquisition of the varnishing line in 2016, at the beginning of 2019 Chomarar invested in a new extruder and a

new graining line for the automotive and luxury leather goods markets.

The first tests carried out on the graining line, showing improved grain quality, were extremely positive; we must now validate these initial results during the industrialization phase.

The new extruder increases production capacity and enables larger widths to be produced.

In addition to PVC, the machine can work with materials such as TPOs, TPUs and new biosourced materials. Initial testing was conclusive and will allow us to offer innovative solutions for all our markets, including hoses, leather goods, automotive parts and protective equipment.



New extruder



New graining machine

A new line dedicated to the development of laid scrim reinforcements for the construction market

In late 2018, Chomarat invested in a new laid scrim manufacturing technology to develop its next-generation reinforcements. This technological innovation is intended in particular for the reinforcement of cement board and roof waterproofing materials. Entirely designed by Chomarat staff, and unique on the market, it is the fruit of all the Group's technological know-how. The new line is now operational at the site in Anderson, South Carolina.

Technological innovation for higher performance

This new pilot line enables Chomarat to accelerate its development projects, focusing on cost, performance and sustainability. The Group's goal is to launch a new generation of laid scrim reinforcements for construction materials, with incomparable performance. All parameters (technological, chemical formulations, textile fibers) are studied to optimize the performance of the laid scrim, such as the protection of glass against attack by cement alkalis, impact resistance, or increased hydrophobic properties. Chomarat's aim is to support the future economic and environmental challenges of the construction sector.

This laid scrim pilot line forms an integral part of the Group's overall innovation and development strategy. The technological evolutions developed on this equipment will enable us to **make a leap forward in innovation and respond to new challenges for construction materials.**



New pilot line

Combining expertise in fabric technologies and chemical formulation

The laid scrim reinforcements designed and developed by Chomarat are reputed for a number of strengths:

- dimensional stability
- high-quality complexing with other materials (film or mesh)
- excellent mechanical performance
- very good protection against the alkalinity of cement



Rotatex™

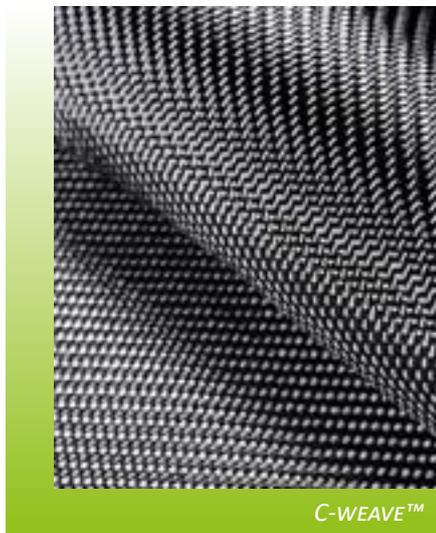
Chomarat's know-how in the manufacture of coated reinforcements lies in its combined expertise in fabric technologies and chemical formulation.

With this new pilot technology, Chomarat will capitalize on these two strengths to produce materials offering even greater performance.

Chomarat carbon reinforcements, selected by the most demanding prepreg suppliers

Prepregs are used in the most demanding markets, such as the aerospace and automotive sectors. Chomarat's C-WEAVE™ carbon fabrics offer excellent performance and have gained a good reputation among impregnators. C-PLY™ multiaxial reinforcements developed by the Group, with multiple oriented plies, enable prepreg suppliers to offer productivity savings for their manufacturing customers.

C-WEAVE™, the ultimate in quality and reliability

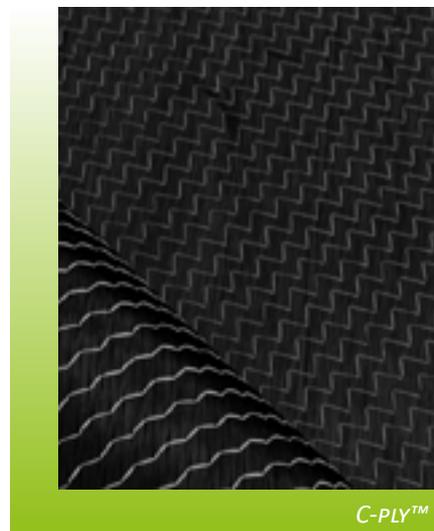


Over the last few years, Chomarat's C-WEAVE™ carbon fiber fabrics have become a benchmark in terms of quality, appearance and processability for prepreg suppliers. The weave contributes to the productivity and dependability of pre-impregnation. C-WEAVE™ is selected because users of prepreg fibers often manufacture high-finish parts for demanding applications, and thus need excellence and reproducibility. In addition to offering responsiveness and high productivity, Chomarat is capable of adapting to customer needs and producing custom fabrics.

"The consistently high quality of C-WEAVE™ is a key element in the success and growth of SHD composite materials."

*Helen Doughty,
Director of SHD Composites*

C-PLY™: taking multiaxial carbon one step further



The advantages of multiaxial reinforcements are now unquestioned – oriented strands, absence of resin-rich areas allowing high fiber content, and improved mechanical tensile and bending performance thanks to non-undulating fibers.

In developing its C-PLY™ range, Chomarat has demonstrated the advantages of multiaxial fibers in terms of performance and appearance.

Chomarat strives to minimize marking on parts and to optimize surface quality by spacing the fibers and using suitable stitches. C-PLY™ can also incorporate aesthetic functions by using the assembly seam as a graphic element.

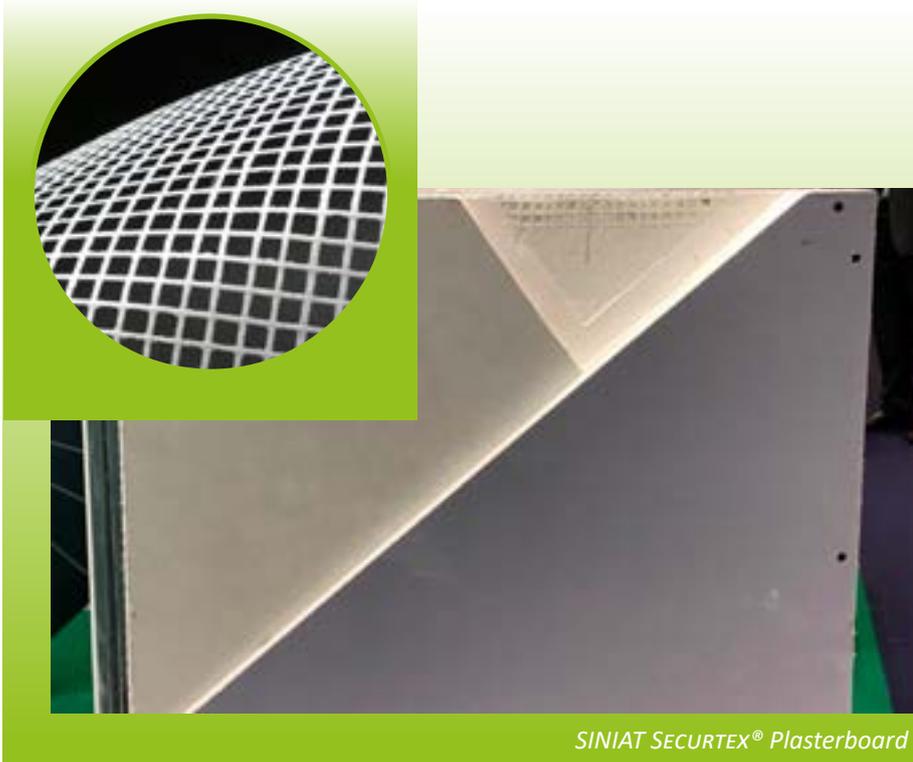
These developments lead to opportunities in the automotive, sports equipment and consumer electronics markets, which seek to combine premium quality and high productivity.

Chomarat delivers to most countries from its sites in France, Asia and the U.S., guaranteeing the same level of quality.

ROTATEX™ reinforces Siniat's SECURTEX® attack-resistant plasterboard

Siniat's newly launched Securtext® integrates Chomarat laid glass scrim (ROTATEX™) into its gypsum plasterboard. According to the dry construction material specialist, it is the first plasterboard-only system certified to Loss Prevention Standard (LPS) 1175 and accredited by the Secured by Design Police Initiative.

ROTATEX™



SINIAT SECURTEX® Plasterboard

Anti-intruder walling system

Siniat SECURTEX® plasterboard contains a laid high-tensile glass scrim from Chomarat, combined with a dense gypsum core.

The glass reinforcement protects the building construction, because it dissipates the force across the whole area of the board, providing impact resistance to both deliberate and accidental damage. No other components are required in the system to design out crime and help avoid long-term maintenance costs caused by damage.

“Chomarat laid glass scrim brings extra mechanical strength and impact resistance to party walls and doorsets. Combined with a dense gypsum core, it prevents damage from tools typically used by opportunistic burglars, such as screwdrivers, or from physical attack, eliminating the need for additional materials such as metal lath or ply in the partition”, explains Pierre Peyron, Industrialization Engineer for SECURTEX®.

Taking advantage of Chomarat's experience in both textiles and chemistry

ROTATEX™ used in SECURTEX® was developed in close collaboration with Siniat. Chomarat designed this glass grid specially to provide good tensile strength and tear resistance. The diameter of the threads is selected to produce a grid with considerable flexibility and mechanical properties. Moreover, the Chomarat coating contributes to the flexibility of the grid and offers excellent resistance to puncture and aging.

Siniat is part of Etex Building Performance, a division of the [Etex group](#).

The new Babolat Pure Aero: legendary spin and power, increased control and feel

Babolat—world leader in racket sports—debuts the newest generation of its celebrated Aero rackets, the Pure Aero. Babolat has continued to improve its aerodynamic concept through a series of innovations.

In 2019, the Pure Aero offers high spin through a clever mix of two innovative concepts, resulting from ambitious technical partnerships:

- Carbon C-PLY™ developed by Chomarat for superior stability
- Cortex Pure Feel developed by SMAC for exceptional feel

Extraordinary stability and incredible feel

The addition of Chomarat's C-PLY™ Hexagonal multiaxial carbon reinforcement at the heart of the Babolat Pure Aero racket enhances stability and boosts performance. The C-PLY™ Hexagonal fiber offers additional stiffening and an exceptional design. This unique fiber traps the color of resin pigments, as it has been designed to remain visible after impregnation.

C-PLY™ Hexagonal is one of the first multiaxial fibers to be used in a racket; it is pre-impregnated and then processed without any modification on the manufacturing line. This reinforcement replaces the UD prepreg traditionally used in this type of process. Integrated in the throat of the racket to give the new Pure Aero extraordinary stability, this carbon reinforcement is more rigid, bringing more stability at impact, which increases control.

This latest version of the Pure Aero offers even greater feel thanks to a technological partnership with SMAC, an innovative French company in the aerospace sector. To



Babolat Pure Aero racket

offer optimal vibration absorption, Babolat has incorporated Smacwrap® fine viscoelastic elastomer technology used in the aerospace industry to develop its Cortex Pure Feel technology. This new material contributes to the incredible feel and also increases control.

Ultimate spin and maximum power

As players rely on spin, not only to defend themselves, but also to lead the game and gain an advantage over their opponent, the new Pure Aero incorporates third-generation aeromodular technology that provides optimal spin with every shot. This technology enhances the aerodynamics of the racket for faster speed at the head.

Finally, the thrilling, cutting-edge design of the new Babolat Pure Aero

makes a bold statement. The frame's bright "Taipan yellow" color was inspired by the highly venomous Taipan snake, native to Australia. Combined with the sporty metallic finish and aerodynamic font, the new Pure Aero stands out on the court.

Chomarat is proud to contribute to this success.

Riding the waves with the boating sector

Within a European market worth around €20 billion, the French boating market represents €4.8 billion (of which just over €1 billion* stems from boat building). Worldwide, the boating market continues to grow by 2 to 3% per year. Industrial companies are primarily riding the wave of motor boats, which account for 80% of the worldwide boating market. France is the historic leader in sailboat production, currently boosted by the growth of catamarans offering the comfort to which current sailors aspire. Between 70 and 80% of catamarans sold worldwide are manufactured on the French coasts.*



Chomarat reinforcements

Chomarat's expertise in the boating sector stems back over 45 years, through its pioneering products for composite boats, including ARAMAT™, ROVIMAT™, ROVICORE™, G-PLY™, ROVIFLOW™ and G-FLOW™. In pursuit of its innovation strategy, the Group offers new glass, carbon or aramid-based reinforcements to increase the mechanical performance of structures while reducing their weight and improving their surface finish. To meet environmental requirements, the Group also assists its customers in

improving their own production processes (transition from open-mold processes to closed mold processes) with reinforcements which facilitate resin flow (G-PLY™) or incorporate draining and structural functions (ROVIFLOW™, G-FLOW™). For layout of reinforcements in molds, Chomarat also offers an alternative to spray adhesives with self-adhesive reinforcement solutions allowing easier positioning, and better control of sizing, thus enhancing quality and reducing VOC emissions.

Weight reduction through carbon fiber

Initially reserved for competition yachts, carbon fiber is increasingly being used in leisure yachting. This sector seeks weight reduction and stiffness enhancement solutions for increasingly large parts. Against this background, Chomarat has developed a multiaxial carbon fiber range (C-PLY™) that facilitates resin penetration through appropriate constructions and fibers.

Chomarat's C-TAPE™ range of carbon tapes were used in the production of the foils for the *Figaro Bénéteau 3* (see [Chomarat News No. 6](#)).

Expertise and tools serving the boating industry

The Group assists its customers in the design of reinforcements and selection of materials. Its in-house composites laboratory is equipped with state-of-the-art instruments that can measure and simulate the permeability of reinforcements and structures, as well as the mechanical properties and surface appearance of finished parts.

And tomorrow?

The proven performance of composites is attracting interest, and these materials are increasingly being considered for use in the professional shipbuilding sector. A host of projects are under consideration for composite propellers, foils on commercial or fishing vessels, composite decks, and more.

Chomarat aims to participate in the growth of composites in this sector and support players on the road to industrialization.

**Source: FIN*



Figaro Bénéteau 3

CERTIFICATIONS

Chomarat holds DNV GL certification for its ranges of multiaxial fibers and glass and carbon tapes, marketed under the G-PLY™, C-PLY™, C-TAPE™ and G-TAPE brands. These certifications are a guarantee of craftsmanship and quality.



CHOMARAT

free to innovate

Chomarat
France

39 avenue de Chabannes
07160 Le Cheylard
France

Phone: +33 4 75 29 81 00

Chomarat
Tunisia

ZI de Grombalia
8030 Grombalia
Tunisia

Phone: +216 722 55 412

Chomarat
North America

160 Alliance Boulevard
Williamston, SC 29697
USA

Phone: +1 864 965 9497

Chomarat
China

36 Qingdao East Road - Taicang
215400, Jiangsu Province
PRC

Phone: +86 512 5373 7001

www.chomarat.com