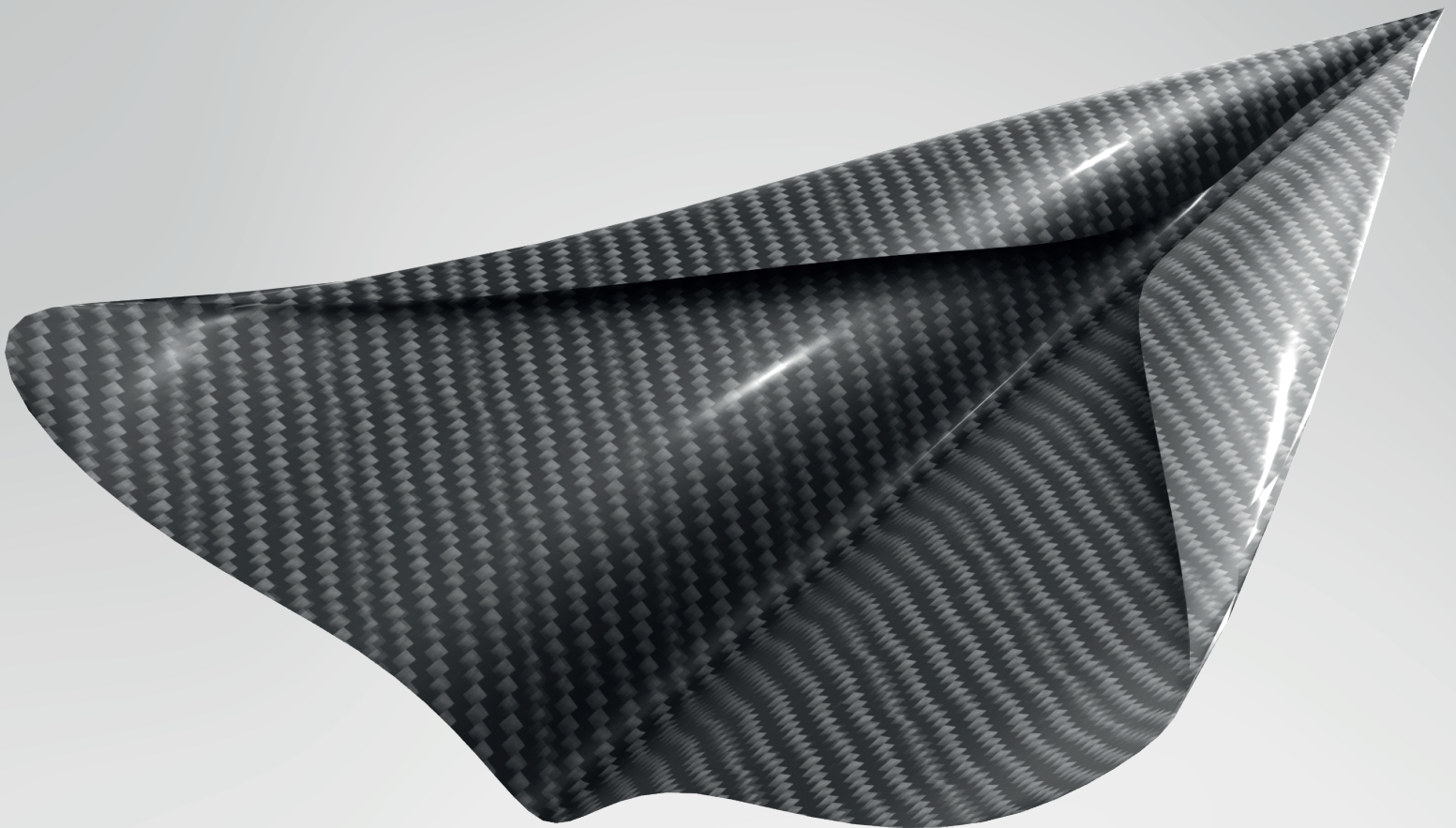


# STYLIGHT®

THERMOPLASTIC COMPOSITE FOR  
AESTHETIC LIGHTWEIGHT APPLICATIONS



# STRUCTURAL STRENGTH MEETS AESTHETICS

STYLIGHT® IS AN INNOVATIVE THERMOPLASTIC COMPOSITE BASED ON STYRENIC COPOLYMERS FOR LIGHTWEIGHT AESTHETIC DESIGN. THIS UNIQUE COMBINATION OF STRUCTURAL STIFFNESS, AESTHETICS, PROCESSABILITY AND DIMENSIONAL STABILITY MAKES STYLIGHT A NEW SOLUTION FOR HIGH PERFORMANCE APPLICATIONS.

## STYLIGHT PROPERTIES PROFILES COMPARED TO ALTERNATIVE THERMOPLASTIC COMPOSITES

	PC composite	TPU composite	StyLight	PA composite	PP composite
Properties	Aesthetic applications			Structural applications	
Mechanical performance	++	+	+++	++	+
Impact strength	+++	+++	++	++	+++
Easy manufacturing*	+	++	++	++	+++
Secondary operation**	++	+++	+++	+	-
Heat resistance at 100°C	++	++	+	+++	++
Chemical resistance	-	+++	++	+++	+++
Dimensional stability	++	++	+++	-	-
Surface waviness	++	++	+++	-	-
Low density	+	+	++	+	+++
Low water uptake	+	+	+++	-	+++

\*includes drapability and formability \*\*includes paintability, decoration, gluing, welding

### STRUCTURAL STIFFNESS

Existing thermoplastic composite materials based on carbon or glass fibre have mostly been used so far in structural applications requiring a very high mechanical resistance to replace metal or thermoset composites. StyLight® is exceeding most of the current competitive thermoplastic composite products in stiffness and strength. Thanks to the amorphous nature of styrenic materials, the high glass transition temperature (TG) of SAN and its stability in humid conditions, StyLight is also stable over a larger temperature window and can be reinforced with back injection molded styrenic based materials.

### DIMENSIONAL STABILITY

Precise and stable dimensions are required in most technical applications, such as in automotive interior parts for a better fit and finish as well as in high performance electronic or sports equipment. StyLight offers the best-in-class dimensional stability thanks to the low shrinkage, post shrinkage and the low water absorption of its styrenic matrix compared to PA based composites. Low shrinkage and low coefficient of thermal expansion (LCTE) reduce the risk of part warpages with temperature.

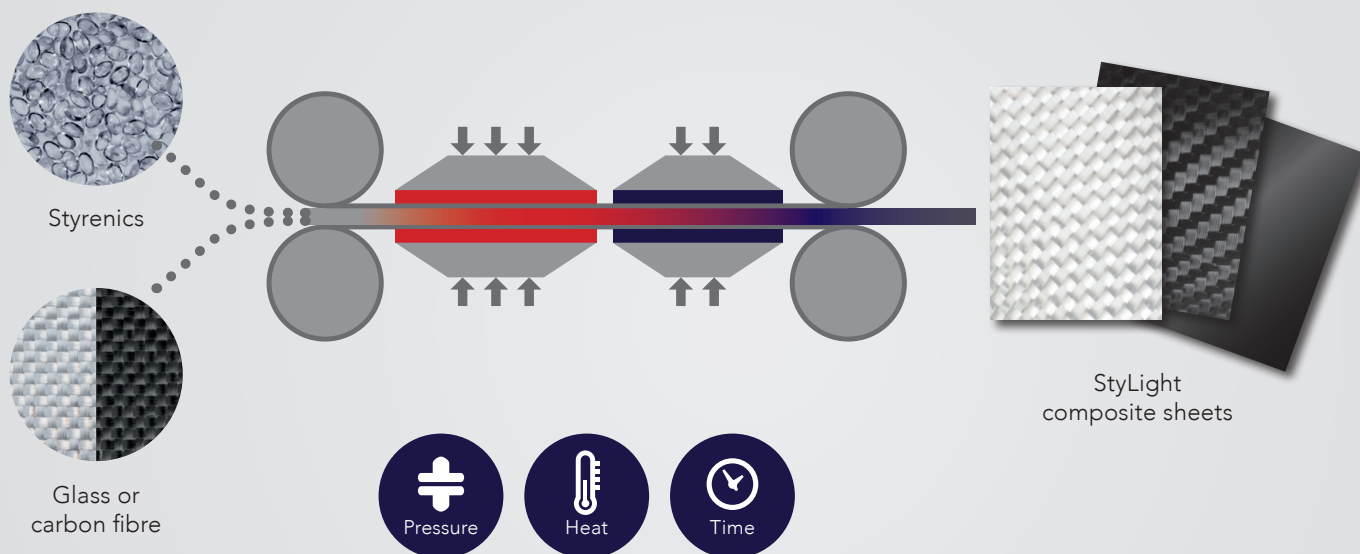
### PROCESSABILITY

The manufacturing process of thermoplastic composite is complex and requires a lot of expertise. StyLight offers an advantage in this field versus other thermoplastics. StyLight's material processing temperature is lower than for PA, PC or PMMA and the cycle times are significantly lower compared to thermoset composites (SMC or RTM). To achieve the best StyLight surface quality it is recommended to use a variotherm technology to manage the tool temperature during the manufacturing cycle. Moreover, the decoration with foils or the painting of StyLight parts require less surface preparation due to StyLight's higher surface quality and the polarity of its styrenic matrix.

### AESTHETIC

While the fibre fabric plays a key role in the mechanical performances of the material, the polymer matrix has a great influence on the part surface aesthetics. StyLight offers outstanding aesthetics when compared with existing composite thermoplastics available on the market. StyLight not only offers the lowest "surface waviness" allowing high gloss surfaces direct from the mold, but also the polarity of styrenics makes it easy to paint or decorate with foils. For the foil decoration INEOS Styrolution validated different foils supplied by the company Leonard Kurz Stiftung. The translucency of natural StyLight is also an interesting feature for backlighted surfaces or "carbon fibre look".

## STYLIGHT – THE PRODUCTION PROCESS



# HIGH PERFORMANCE COMPOSITE FOR CUSTOMIZED SOLUTIONS

THANKS TO ITS OUTSTANDING MIX OF PROPERTIES,  
STYLIGHT IS IDEAL FOR HIGH PERFORMANCE APPLICATIONS  
ACROSS MULTIPLE INDUSTRIES.

## AUTOMOTIVE

- CARBON DECORATIVE PARTS
- SEAT COMPONENT
- LOCAL REINFORCEMENT
- DOOR COMPONENT
- CENTER CONSOLE
- BODY PANELS
- SPOILER



Console (StyLight design study)



Spoiler



StyLight demonstrator presented at K 2016



### NEW NEEDS, NEW OPPORTUNITIES

As the industry requirements are becoming more stringent, new design and high performance materials are necessary. The automotive industry is one of the most demanding. Currently driven by energy and resource efficiency, it needs lightweight solutions without compromising on aesthetics, safety, performance and cost. StyLight caters to exactly these needs. StyLight characteristics are also appealing to the electronics or the sports and leisure industry which require lightweight and robust equipment with an attractive look.

### SHAPING THE FUTURE

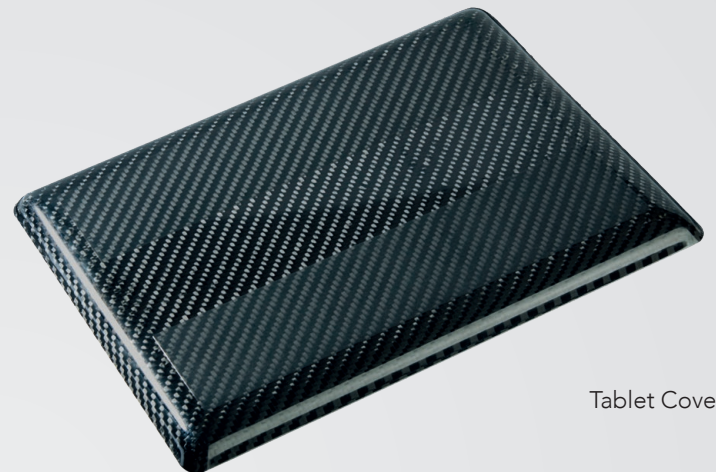
StyLight offers a unique combination of aesthetic and structural stiffness at an affordable price without any equivalent on the market. It is a new solution for designers looking for weight reductions in decorative applications with semi-structural stiffness. Finally, its excellent processability allows a cost-efficient production.

## TOYS, SPORTS & LEISURE

- SPORT HELMETS
- SPORT PROTECTION, BRACES
- BICYCLE PARTS
- LUGGAGE
- SPORT SHOES



Helmet in carbon-optics



Tablet Cover

## ELECTRONICS

- BACKCOVER FOR TABLETS, NOTEBOOKS, MOBILE PHONES
- MOBILE PHONE CASING
- LOUDSPEAKER CONES
- DRONES

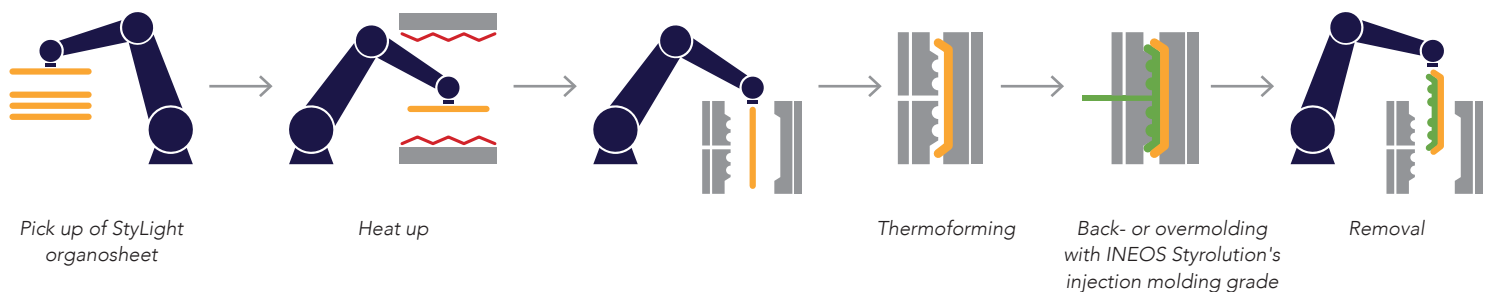
# FROM STYLIGHT TO YOUR APPLICATION

STYLIGHT GRADES ARE BROUGHT TO OUR CUSTOMERS AS SEMI-FINISHED GOODS (THERMOPLASTIC SHEETS), READY FOR PROCESSING VIA THERMOFORMING AND OVERMOLDING.

## PROCESSING VIA THERMOFORMING AND BACKMOLDING

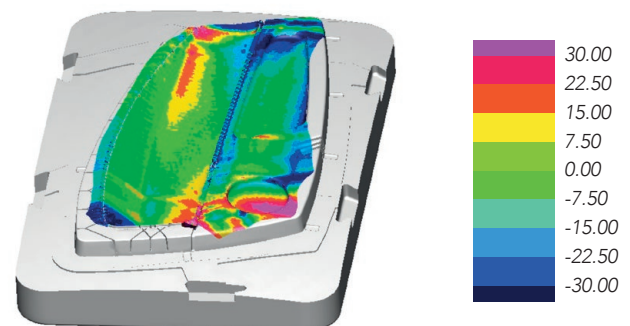
Processing our StyLight grades is easy and efficient: In a thermoforming process, the sheet is heated up to its softening point and handled to the mold. Then the softened sheet conforms to the shape of the mold during the “draping” phase. StyLight is relatively easy to drape with a minimum risk

of wrinkles and tears. During this phase StyLight also offers the possibility to be decorated with a preformed insert placed in the mold (IMD). The sheet can then be back- or over molded with specific glass fibre reinforced injection molding grades (“SL Grades”) in the same processing step and is held in place until it cools down.



## OUR SIMULATION SUPPORTS CAPABILITIES

Simulations of the draping and the back injection molding process facilitate the design of components based on organosheets. With the help of industry leading partners, INEOS Styrolution developed material cards for StyLight allowing customers to optimize their mold design, processing parameters and surface appearance. Continued developments for structural simulations, dimensional stability and even crash behavior are currently ongoing.



# INEOS STYROLUTION AT A GLANCE

INEOS Styrolution is the leading styrenics supplier with a focus on styrene monomer, polystyrene, ABS Standard and styrenic specialties. With a rich heritage and a unique business model, INEOS Styrolution helps its customers succeed by offering the best possible solution, designed to give them a competitive edge in their markets.

 **3,200**  
EMPLOYEES

 **9**  
COUNTRIES

**16**   
PRODUCTION SITES

 **6** R&D  
CENTERS

 **24** sales  
offices

**Nº1**  
GLOBAL  
LEADER  
in styrenics

**85+**  
YEARS  
of experience  
in styrenics

founded in  
**2011**

APPROX. **1,000**  
PATENTS

**4,000+**  
CUSTOMERS

**1,500+** PRODUCTS

**2,000+** APPLICATIONS ACROSS SEVEN INDUSTRIES

**5.3** BILLION  
EUROS IN REVENUE  
IN 2017



AUTOMOTIVE



ELECTRONICS



HOUSEHOLD



CONSTRUCTION



HEALTHCARE



PACKAGING



TOYS, SPORTS  
& LEISURE



## LET'S COLLABORATE

If you would like further details, need assistance in creating your applications, or are curious to explore new possibilities with styrenics, please contact us! Please also refer to: [ineos-styrolution.com](http://ineos-styrolution.com)

### CONTACT US IN EUROPE

By eMail:  
[infopoint.emea@styrolution.com](mailto:infopoint.emea@styrolution.com)

By phone: (49) 2133 51 4007

### CONTACT US IN AMERICAS

By eMail:  
[infopoint.americas@styrolution.com](mailto:infopoint.americas@styrolution.com)

By phone: (1) 866 890 6354

### CONTACT US IN ASIA PACIFIC

By eMail:  
[infopoint.asia@styrolution.com](mailto:infopoint.asia@styrolution.com)

By phone: (65) 6933 8372

---

## **INEOS Styrolution Group GmbH**

Global Headquarters

Mainzer Landstrasse 50

60325 Frankfurt am Main, Germany

[ineos-styrolution.com](http://ineos-styrolution.com)

### PLEASE NOTE

The data contained in this publication are based on our current knowledge and experience. In view of the many factors that may affect processing and application of our product, these data do not relieve processors from carrying out own investigations and tests; neither do these data imply any guarantee of certain properties, nor the suitability of the product for a specific purpose. Any descriptions, drawings, photographs, data, proportions, weights etc. given herein may change without prior information and do not constitute the agreed contractual quality of the product. It is the responsibility of the recipient of our products to ensure that any proprietary rights and existing laws and legislation are observed. (February 2018)

### PHOTO CREDIT

Shutterstock.com: Meirion Matthias (3), TLaoPhotography (3), antpkr (3), satit sewtiw (5); KTM Technologies (4)