JUSHI®

Compofil®

高性能复合纤维

HIGH PERFORMANCE HYBRID FIBERS

中国巨石股份有限公司
CHINA JUSHI CO., LTD

中国巨石

中国巨石股份有限公司(简称“中国巨石”，股票代码“600176”)，是世界玻纤领军企业，多年来一直在规模、技术、市场、效益、质量等方面处于领先地位。

公司荣膺中国工业大奖、中国专利金奖、国家科技进步奖、全国质量奖、制造业单项冠军，是国家重点高新技术企业、国家技术创新示范企业、国家级智能工厂、国家级绿色工厂，拥有国家认定企业技术中心、国家级博士后科研工作站。

中国巨石在无碱玻纤、高性能玻纤和绿色制造等领域拥有自主核心的技术。公司生产的玻纤产品品种广泛、品类齐全有150多个牌号3000多个规格品种，主要包括无碱玻璃纤维无拈粗纱、短切原丝短切毡、方格布、电子布等玻纤产品。

公司现有总资产超486亿元，玻璃纤维产能逾260万吨，拥有浙江桐乡、江西九江、四川成都、江苏淮安(在建)四个国内生产基地，以及埃及苏伊士和美国南卡两个海外生产基地，并在加拿大、美国、南非、韩国、印度、意大利、法国、西班牙、日本和香港等10多个国家和地区成立了海外销售子公司，与全球100多个国家和地区建立了合作关系，营销网络辐射全球。

巨石人始终坚持“品行、创新、责任、学习、激情”的企业文化核心理念，致力于成为规模第一、技术领先、队伍优秀、管理精细、执行有力、业绩优良、高质成长的国际化企业集团!

Company Profile

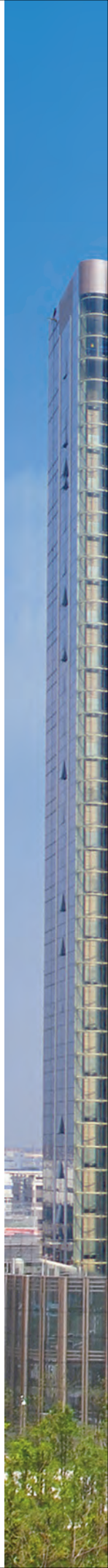
China Jushi Co., Ltd. (“China Jushi” with thestock code 600176) is a global leader in thefiberglass industry. It maintains the leader ship position in terms of scale, technology, market, profitability and quality for many years.

The company has won a number of prestigious awards such as China Grand Award for Industry, China Patent Gold Award, the National Science and Technology Progress Award, China Quality Award and the National Gold Medal Award for Specialized Manufacturers. It is also a China National Key High Techno-logy Enterprise, a National Technology Innovation Demonstration Enterprise and a National Green Manufacturer. It owns a National Enterprise Technology Centerand operates a distinquished Post-Doctoral program.

China Jushi owns proprietary core technologies in E-glass fiber, high performance glass fiber, green manufacturing and many more. We produce a wide range of fiberglass products of over 150 categories and more than 3,000 specifications including E-glass rovings, chopped strands, chopped strand mats, woven rovings and electronic fabrics.

The company has total assets of over 48.6 billion yuan and a glass fiber capacity of more than 2.6 million metric tons. We have six production bases across the world, including four bases in China located respectively in Tongxiang, Jiujiang, Chengdu and Huai’an, and the other two in Suez, Egypt and South Carolina, the USA. We establish a number of overseas sales subsidiaries in over 10 countries and regions including Canada, the United States, South Africa, South Korea, India, Italy, France, Spain, Japan and Hong Kong, and have partners in more than 100 countries and regions, which form a globalized sales and marketing network of our company.

Jushi people adhere to the core values of “Conduct, Innovation, Responsibility, Learning, Passion" and are committed to build the company into an international corporation with the largest scale, leading technology, excellent team, lean management, powerful execution, outstanding operating results and high quality growth.



JUSHI®

Compofil®

复合纤维

HIGH PERFORMANCE

Compofil® 特点优势

与传统的复合材料预浸料相比，Compofil®所具有的独特优势在于：

稳定的热塑性预浸料，自身浸渍优良

---有效解决了由于热塑性树脂熔体粘度大而导致的玻纤浸渍困难的问题

成型工艺简单，周期短，生产效率高

---降低生产成本，提高客户产品的市场竞争力

玻璃纤维含量高，力学性能高

---高含量的连续纤维增强，使得制品具有优异的机械性能，适用于结构件

环境清洁，可回收，绿色环保

---热塑性树脂加热熔融的特点使其复合材料能很好满足清洁生产、绿色环保的社会理念

BENEFITS of Compofil®

Compared with traditional composite prepreg, Compofil® offers the following unique benefits

Stable thermoplastic prepreg with excellent self-impregnation

Excellent permeation of fiber glass in the thermoplastics

Short processing cycle and high productivity

Low production cost, high competitiveness

High glass content and excellent mechanical properties

High glass content, specifically designed for structural applications

Environment-friendly production process and recyclability

Recyclable and environment friendly

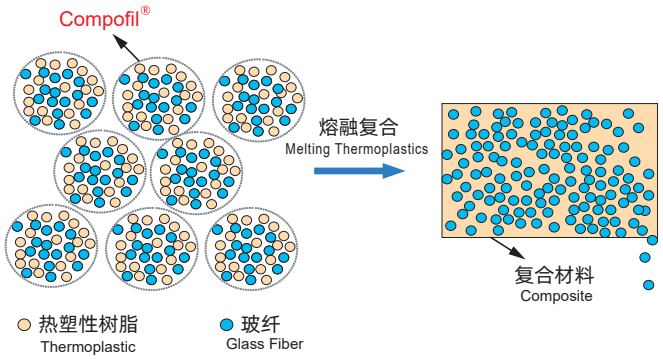
Compofil® 简介

Compofil®是以连续玻璃纤维为原料，通过与热塑性树脂复合而成的高性能预浸料，可直接用来制备高性能连续玻璃纤维增强热塑性复合材料，而不需要添加额外的树脂。

该产品适用的主要成型工艺有模压成型、层压板材成型、缠绕成型、拉挤成型、真空辅助成型，其应用领域涵盖航空航天、汽车工业、建筑、体育器材、新能源等。

PRODUCT INTRODUCTION

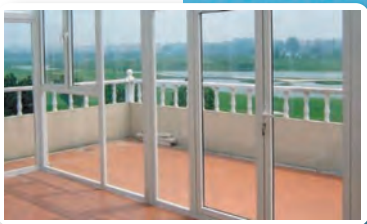
Compofil®is thermoplastic prepreg made from continuous fiberglass coated with thermoplastics. It is specially designed to manufacture high performance composite components directly with no need for extra resin. It is suitable for various composite processes including compression molding, vacuum molding, filament winding, pultrusion, etc., widely applied in aerospace, automotive, construction, sports and new energy industry.



Direct roving, good compatibility with resins, excellent mechanical properties of composite products

产品牌号 Product Code	典型线密度 Nominal Linear Density (tex)	适用树脂 Resin Compatibility	产品特点 Product Features	典型应用 Typical Applications
354	1870, 800	PP	PP复合纱，自身浸渍好，力学性能优异，适用于模压工艺 *Hybrid fiber with PP, good impregnation, excellent mechanical properties, suitable for compression molding process*	模压板材 *Compression molding boards*
354A	1870	PP	PP复合纱，力学性能好，耐疲劳性能优异，适合缠绕工艺用 *Hybrid fiber with PP, good mechanical properties, excellent fatigue resistance, suitable for winding process*	缠绕管道 *Winding pipes*
356	2690	PET	PET复合纱，自身浸渍好，力学性能优异，适用于拉挤工艺 *Hybrid fiber with PET, good impregnation, excellent mechanical properties, suitable for pultrusion process*	拉挤型材 *Pultrusion profiles*

建 筑 类 Building



体 育 类 Sports

新能源类 New Energy

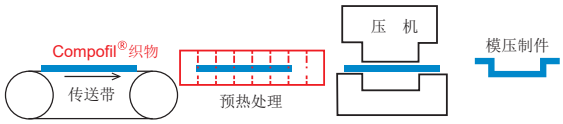
JUSHI®

Compofil®
复合纤维
HIGH PERFORMANCE

Compofil®成型工艺

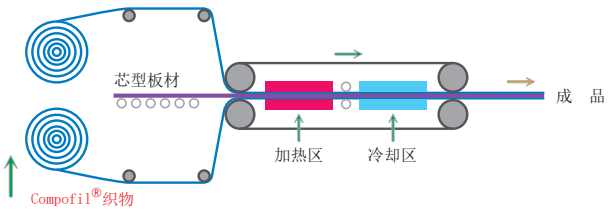
1. 模压成型

将Compofil®织物按设计要求叠放后，通过预热处理，使树脂活化，然后快速在冷压机上压制成所需制件；该工艺成型周期短，适用于大批量生产。



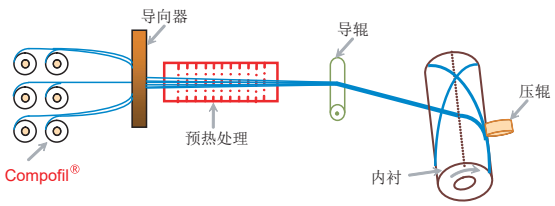
2. 层压板材成型

将Compofil® 织物（含夹芯材料或不含夹芯材料的）按设计要求叠放后，把所有材料输入双带层压机，让机器对织物进行加热处理，使其迅速活化，然后在冷却区快速冷却成型所需制件；该工艺为连续化成型，生产效率高，适用于大批量生产。



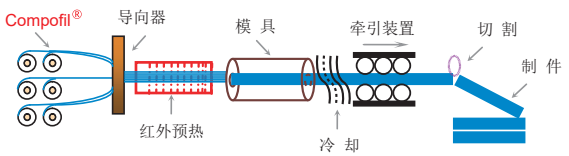
3. 缠绕成型

将Compofil®通过张力系统直接退绕，再经过预热熔融处理后活化，然后将Compofil® 快速地往复缠绕在回转的芯轴上，缠绕角度与排列密度根据强度设计，并由主轴转速与往复速度精确控制。所得制品具有极高的抗冲击性能，适用于高压气瓶等应用领域。



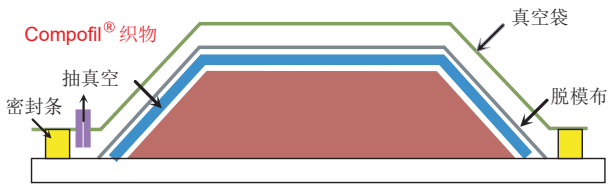
4. 拉挤成型

将Compofil® 在牵引设备的拉引作用下经过导向器、红外预热装置后活化，再通过模具成型，最后冷却后切割形成最终制品。该工艺适用于光缆加强芯、高强门窗框等应用领域。



5. 真空辅助成型

在模具上铺Compofil®织物、脱模布，然后铺上真空袋，抽出体系中的空气，使之形成负压；然后模具升温，最后冷却制得最终制品。

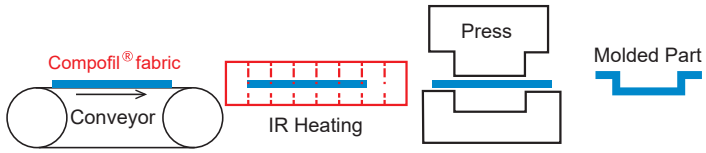


汽 车 类

PROCESSES

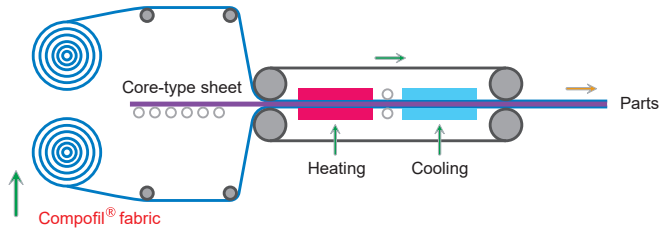
1. Mold Pressing

Sheets of fabric as designed unidirectional, plain, twill and satin are placed, then heated to reactivate itself and pressed rapidly in the mold, to form the composite parts.



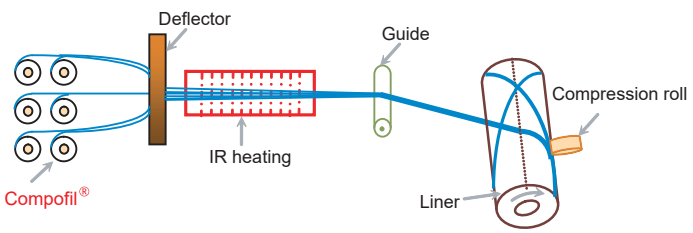
2. Laminate Molding

Sheets of fabric as designed are placed on the mold according to design requirements, then put into the laminate machine to reactivate itself; The end parts are got by the cooling process; The molding process is continous with high productivity suitable for mass production.



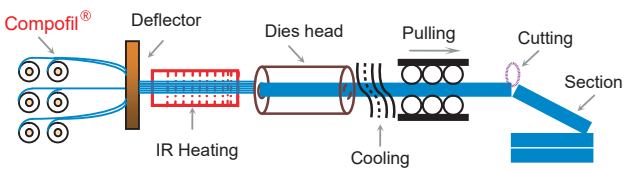
3. Filament Winding

Filament winding is an automated open molding process that uses a rotation mandrel and a compression roll as the mold. Compofil® are drawn through a deflector and pulled by the force of a rotating mandrel. After Compofil is heated to reactivate, the roving is wound around the mold, forming the composite parts. Filament winding is used to deliver high strength, specifically important for various applications, such as gas tanks, pipes and so on.



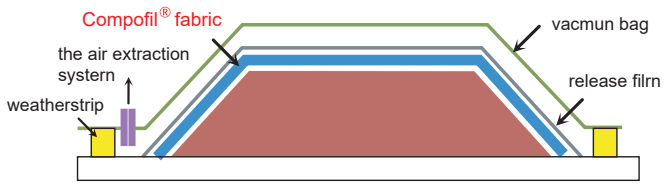
4. Pultrusion

The Compofil® is pulled by the traction device, through the guide roller, IR heating device and the mold forming, and then finally cooled, cut to form the final products. The process is suitable for high-strength applications such as door frames, fiber reinforced core, and so on.



5. Vacuum-Assisted Molding

Compofil® fabric is spread onto the mold with mold release film, then covered with the release film and a vacuum bag in order, consisting the air extraction system and getting a negative pressure; then the mold is heated and finally the final product is obtained after cooling.



Automotive

技术合作与支持

中国巨石拥有世界一流的自主核心技术，建立了涉及玻璃、有机化工、玻璃纤维、复合材料等领域的先进试验手段和检测分析能力；我们在各大洲都建立了营销网络和技术服务体系，帮助客户解决从材料到工艺的一系列问题，与客户紧密合作，应对市场挑战，共同推进复合材料产业的发展。

我们将与大家共享复合纤维的信息，以及复合材料的合成技术和工艺流程方面的知识。

CUSTOMER AND TECHNICAL SUPPORT ORGANIZATION

Offer Best Technical Support

China Jushi possesses world class core technologies and advanced testing and analysis capabilities for glass, organic chemistry, fiberglass and composites. We have established a global network of marketing and technical service professionals to help customers solve problems in materials development and process optimization. We collaborate closely with customers to address market challenges and promote the growth of the composites industry.

We will share with you all the information on Compofil as well as our considerable knowledge of compounding and molding technology and processes.

中国巨石股份有限公司
CHINA JUSHI CO., LTD

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