

## Brief Introduction 公司简介

江苏长海复合材料股份有限公司成立于 2000 年，是一家集科研、产品开发、生产、销售、服务于一体的民营科技型上市企业。

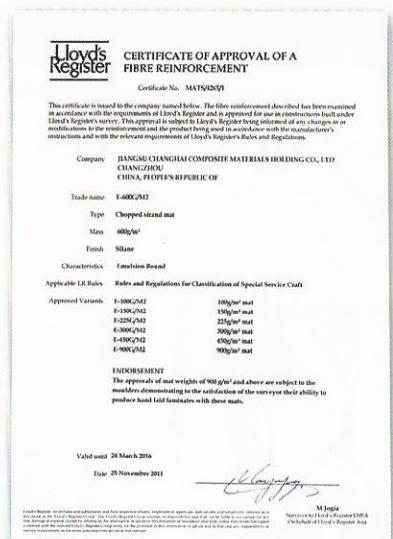
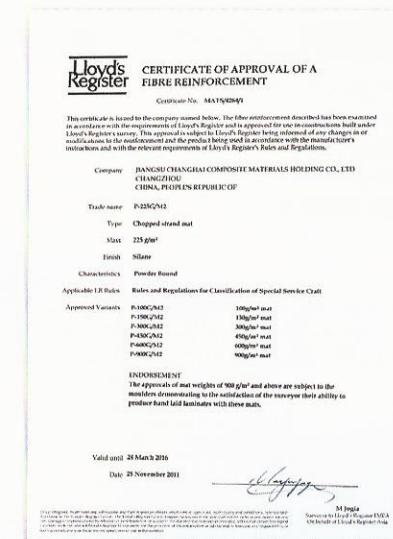
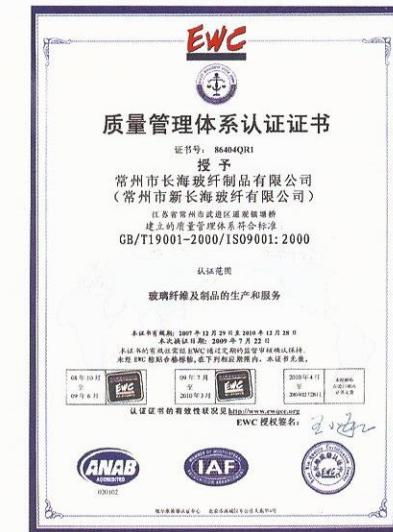
目前，公司已建成年产 3 万吨的无碱池窑和 7 万吨的 ECR 池窑，形成了以玻璃纤维纱、玻璃纤维短切毡、湿法薄毡、涂层毡为主的四大产品系列，品种覆盖各种无碱玻纤直接纱、喷射纱、SMC 片材用纱、车顶棚用纱、透明板用纱、缠绕挤拉纱、短切毡用纱及无碱玻纤短切毡、薄毡、蓄电池复合隔板、方格布、网格布、复合毡与缝编毡、新型墙体保温复合贴面材料系列等。近年来，公司又引进了玻璃纤维连续毡，玻璃纤维复合防火层压板等生产线。产品应用领域包括汽车制造、游艇、卫浴设施、储罐、管道包覆、冷却塔、透明板材、建筑装饰等。

公司现有国际先进的多条玻璃纤维制品生产线，拥有拉力、厚度、可燃物含量等一系列高端质量检测设备和全电脑检测分析仪，保证玻纤生产的每一个环节都经过严格的检测。公司通过了 ISO9001:2000 质量管理体系认证，并获全国防水行业建设奖，被江苏省科学技术厅认定为江苏省高新技术企业；新型超细玻璃纤维复合隔板被命名为江苏省高新技术产品。2008 年公司通过 ISO14001 环境管理体系。2011 年 3 月 29 日江苏长海复合材料股份有限公司在深圳交易所创业板上市，股票代码 300196。

Changzhou Changhai Composite Materials Holding Co., Ltd., founded in 2000, is a large listed scientific and technical enterprise focusing on scientific research, product development, production, sales and service in the area of fiberglass products manufacture.

Now, the company had successfully completed the first E-glass furnace with output of 30,000 tons and the second ECR furnace with output of 70,000 tons, the company has formed four main series of products for fiberglass roving, chopped strand mat, fiberglass tissue and coated mat, covering all kinds of E-glass roving for filament winding, spray-up roving, SMC roving, chopping roving for headliner, panel roving, roving for pultrusion, assembled Roving for Chopping and chopped strand mat, tissue, colored & printed tissue, battery separator, new insulation wall cover material, stitch combi mat, woven roving, mesh and so on. In recent years, Changhai introduced the new product lines for continuous filament mat, fiberglass high pressure laminate. Applications include automobile manufacturing, yachts, private facilities, storage tank, pipeline coating, cooling towers, architectural decoration, and so on.

By now, the company has several advanced glass fiber production lines. With kinds of international advanced quality testing equipments in tensile strength, thickness and binder content and computer analysis instruments, every progress of fiberglass is produced in rigorous testing. The company obtained the ISO9001: 2000 quality management system certification, and it received the awards of Construction of national waterproof industry and was identified as the high-tech enterprises in Jiangsu Province. New ultra-fine glass fiber compound separator was named the high-tech products in Jiangsu Province. On March 29, 2011, Jiangsu Changhai Composite Materials Holding Co., Ltd is listed on the Shenzhen Stock Exchange GEM, the stock code is 300196.



## 玻璃纤维短切毡

### Chopped strand mat

玻璃纤维短切毡是由玻璃纤维短切后，无定向均匀沉降，施加粉末或乳液粘结剂制成的玻璃纤维无纺增强材料。主要适用于手糊玻璃钢和机械成型工艺，易于加工处理并有极好的成型性能。

玻璃纤维短切毡树脂浸透快，具有极高的透明度，同时，均匀的纤维分布使产品覆模性好，在成型后强度好。玻璃纤维短切毡广泛应用于采光瓦、冷却塔、化学品储藏罐、FRP 管道、洁具、船体和甲板以及 FRP 车厢板等等。

同时公司也提供轻克重的玻璃纤维短切毡

Our Chopped Strand Mat is fine strand reinforcement material made from E-glass cut fibers laid in a random pattern and bonded with powder or emulsion binder. It is specially designed for hand lay-up and continuous laminating process. It is easy to handle and has excellent moulding performance.

Also, it has rapid resin penetration together with a fast strand wet out time. The mat also brings a highly translucent finished laminates. Also, the fine strand input makes the fiber prominence at the finished laminates surface extremely low. It is an excellent reinforcement material for translucent roofing panel, chemical storage tanks, FRP pipes, boat hulls and decks, truck body panel and so on.

We can also supply light weight chopped strand mat.



#### 产品特点 Product Features

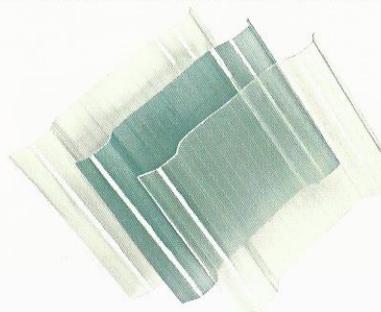
- 克重分布均匀
- 树脂浸透快，且速度一致
- 容易消除气泡，提高工作效率
- 成品透明度好
- 软硬适中，覆模性好
- 与 UP 、VE、EP 树脂相溶
- 消耗树脂少，降低生产成本
- Excellent weight uniformity
- Fast wet out
- Easy air release
- Excellent transparency of finished products
- Excellent laminate clarity
- Low resin consumption

#### 技术参数 Technical Specification

产品代号 Property	单重(%) Area Weight	含水率(%) Moisture Content	可燃物含量(%) Binder Content	拉力强度(N/150mm) Tensile Strength	幅宽(mm) Width
测试方法TestMethod	ISO3374	ISO3344	ISO1887	ISO3342	ISO 5025
EMC85	85	≤0.20	9±5	≥50	±5
EMC100	100	≤0.20	9±5	≥70	±5
EMC120	120	≤0.20	9±5	≥100	±5
EMC225	225	≤0.20	2-8	≥80	±5
EMC300	300	≤0.20	2-8	≥130	±5
EMC450	450	≤0.20	2-8	≥150	±5
EMC600	600	≤0.20	2-8	≥170	±5
EMC900	900	≤0.20	2-8	≥180	±5

备注：幅宽范围一般从 200mm 至 3600mm，客户如有其他要求也可定制。

Note: It's available with a width range from 200mm—3600mm. Other specifications are also available on customer requests.



## 玻璃纤维连续毡

### Continuous Filament Mat

玻璃纤维连续毡是一种新型单丝叠层无纺增强材料，它以连续单丝无定向曲线排布构成多结点交错结构。不经集束直接通过浸润剂粘结而成。具有各向同性好，强度高，树脂浸透速率快，制品平整度与表面光洁度高等优点，特别适合于生产拉挤型材和形状复杂的模压成型复合材料制品。

Continuous filament mat is made up of continuous fiberglass strand (its main raw material is continuous fiberglass strand). It is containing an insoluble for unsaturated polyester, epoxy, phenolics and polyurethane resin compatibility in unfilled or filled resin system. It could be used for RTM, infusion, pultrusion process etc., for example automotive inner decorative parts and cable insulation materials.



#### 产品特点 Product Features

- 干湿态强度高
- 浸透速度快
- 具有良好的覆膜性，生产的型材外表光
- High Breaking Strength of dry and wet condition
- Rapid wet-through
- Easily conforms to complex shapes,while providing a smooth finished surface

#### 技术参数 Technical Specification

克重 Density (g/m <sup>2</sup> )	含水率 Moisture Content(%)	可燃物含量 Binder Content(%)	拉伸强力 Tensile strength (N/75 × 200mm)	门幅 width (mm)
300	≤ 0.2	2.1 ~ 6.3	> 60	1040,1270
400	≤ 0.2	2.1 ~ 6.3	> 75	1040,1270



## 无捻粗纺方格布

### Woven roving

无捻粗纺方格布是一种由直接纱交织而成的双向织物。

无捻粗纺方格布适用于许多树脂，例如不饱和聚酯树脂、乙烯基树脂和环氧树脂。

无捻粗纺方格布是一种高性能的增强材料，广泛用于手糊和机械成型产品，如船艇、容器、飞机和汽车部件，家具、运动设施和其它应用领域。

Woven roving is a bidirectional fabric made by interweaving direct rovings.

Woven roving is compatible with many resins, such as polyester, vinyl ester and epoxy resins.

Woven roving is a high-performance reinforcement and widely used in processes such as in hand lay-up, molding, and pultrusion for the production of boats, automotive parts, furniture, sport facilities and other fields.



#### 产品特点 Product Features

- 与多种树脂相溶
- 贴膜性好，垂直型好，易于操作
- 浸透性好，施工效率高
- 透明性佳
- 极佳的机械性
- Multi-resin-compatible
- Easy shape adaptation
- Easy impregnation
- Good transparency
- Excellent mechanical properties

#### 技术参数 Technical Specification

产品代号 Product code	单重(%) Area weight	经纬密度 (头/厘米) Density warp × weft (ends/cm)	粗纱线密度 Tex (warp × weft)	可燃物含量 Combustible content (%)
EWR200	200	4.6 × 4.6	200 × 200	0.4-0.8
EWR270	270	4.6 × 4.1	300 × 300	0.4-0.8
EWR360	360	3.2 × 1.8	600 × 900	0.4-0.8
EWR400	400	3.6 × 3.2	600 × 600	0.4-0.8
EWR450	450	3.2 × 2.8	600 × 900	0.4-0.8
EWR500	500	2.2 × 2.0	1200 × 1200	0.4-0.8
EWR580	580	2.6 × 2.2	1200 × 1200	0.4-0.8
EWR600	600	2.6 × 2.4	1200 × 1200	0.4-0.8
EWR800	800	2.0 × 1.6	2400 × 2400	0.4-0.8

备注：幅宽范围一般从 50mm 至 3300mm，客户如有其他要求可定制。

Note: It's available with a width range from 50mm-3300mm. Other specifications are also available on customer requests.



## 缝编毡和缝编复合毡

### Stitch mat and stitch combo mat

缝编毡是将原纱短切成 5cm 后，均匀沉降，然后用涤纶线缝编而成的一种玻璃纤维织物。

缝编复合毡是由无捻粗纺布复合一层均匀平铺的短切原丝，然后缝编而成的玻璃纤维织物。

该两种产品适用于不饱和聚酯树脂、乙烯基树脂、酚醛树脂和环氧树脂等。广泛应用于玻璃钢拉挤成型工艺、手糊成型工艺和树脂传递模塑料工艺等。缝编毡和缝编复合毡在造船业和 FRP 管道业应用最广，主要终端产品有：玻璃钢船体、管道连接、法兰、板材、冷藏器具和型材等。

Stitch mat is a fabric made by chopping continuous strands into chopped strands of certain length and stitching together the chopped strands.

Stitch combo mat is a complex mat made by stitching, together woven roving and a layer of evenly distributed chopped strands.

They are compatible with polyester, vinyl ester, phenolic and epoxy resins. The product is widely used in pultrusion, hand lay-up and RTM processes. The product is used most widely in the boat industry and the typical applications include FRP boat hulls, automotive housings and doors, laminates, cooling apparatus and structural shapes.



#### 产品特点 Product Features

- 厚度均匀
- 渗透速率高
- 拉力强度佳
- 尺寸稳定性好，不易产生位移变形
- 便于树脂的流动和渗透
- Even thickness
- Fast wet out
- Good tensile strength
- Dimensional stability
- Better wet out and resin flow

#### 技术参数 Technical Specification

产品代号 Product code	克重 Total(g/m <sup>2</sup> )	短切毡 CSM(g/m <sup>2</sup> )	方格布 Roving/WR(g/m <sup>2</sup> )	宽幅 Width(mm)	层数 Layers	每卷重量 Unit Roll weight
EMK300	300	300		20-3300	单	
EMK450	450	450		20-3300	单	
EMK600/275	875	275	600	20-3300	双	60kg
EMK600/450	1050	450	600	20-3300	双	60kg
EMK800/275	1075	275	800	20-3300	双	60kg
EMK800/450	1250	450	800	20-3300	双	60kg



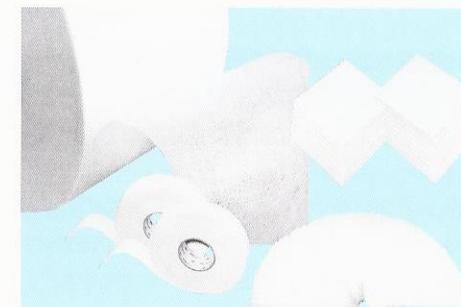
## 蓄电池隔板毡和蓄电池隔板

Tissue battery separator and battery separator

蓄电池隔板毡主要用作铅酸蓄电池隔板的基材，用含 S-BM 制成的复合隔板具有较好的耐振动性能和机械强度，用此隔板装配的蓄电池起动能力强，使用寿命也较长。

The battery separator tissue is chiefly used as the base material of lead acid battery separator. The compound battery separator with S-BM series mat possesses a good vibrating resistance with a good starting ability and longer service life.

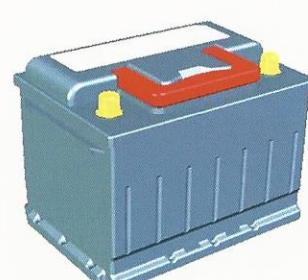
- 产品具有表面平整，吸液能力强，耐酸性好，厚度均匀，高锰酸钾还原物少等特点。
- 同时我公司还提供玻纤复合隔板系列和AGM 隔板毡系列。
- The surface is level and smooth, with good liquid absorption, well acid resistance, even thickness and few potassium permanganate reeducate etc.
- Also we can supply fiberglass compound separator series and AGM separator series.



## 玻纤网格布 Fiberglass mesh

玻纤网格布是水泥、塑料、沥青、大理石、屋面、墙体等理想的增强材料。  
The product is used in cement, plastic,marble,roof,inside and outside wall etc.  
Widely used as an ideal reinforcement material.

- 强度高、耐碱、耐酸，与树脂粘结性强，易溶于苯乙烯，硬挺性、定位性极佳，是理想的增强材料。
- 我公司可以生产各种克重的网格布，例如 40, 70, 90, 110, 135, 150, 165, 210 等。
- High strength, excellent alkali and acid resistance, strong adhesion with resin, easy dissolution in styrene, with top stiffness and locativeness, widely used as an ideal reinforcement material.
- We can supply the woven mesh with different weight ( $\text{g}/\text{m}^2$ ) like: 40, 70, 90, 110, 135, 150, 165, 210 and different width (cm) like: 20,50,100,135. Also the production with user's specification can be made.



## PE 电池隔板

PE battery Separator

PE 电池隔板的发明延长了酸铅蓄电池的使用寿命，特别表现在较高的温度环境下与标准 PE 分离板比较，具有较高的抗穿刺性，将最大限度地减少网格扩展引起的尖角穿刺问题。PE 隔板广泛应用于不间断电源蓄电池，叉车蓄电池，高尔夫球车电池。

PE separation designed to extend its service life in lead acid battery especially in the higher temperature condition. Also having a higher puncture resistance as compare with the standard PE separator.it would minimize the puncture problem caused by the sharp corner of the expansion grid.PE Separator is widely being used in UPS Battery,Fork-lift Battery, Golf-cart Battery.

### 汽车蓄电池隔板 Automotive Separators

标准自动汽车电池，采用独特的工艺确保其高性能工作。特别的自动和小型汽车电池，PE 隔板两侧的侧板会尽量减少隔板氧化引起的裂缝，从而延长电池的使用寿命。适用于起动电池及免维护汽车电池。

Standard AUTO,Unique process adopted ensures high performance.  
Special AUTO+MINI,Ribs on both side of PE separator would minimize the separator cracks caused by the oxidation,thus,extend battery's life..Adapt to SLI batteries and maintenance-free automotive batteries.

### 技术参数 Technical Specification

Item/项目	Units/单位	Standard/标准
B/W	mm	$0.200 \pm 0.030$ $0.250 \pm 0.030$
O/A	mm	$(0.80 \sim 1.30) \pm 0.05$
Puncture Resistance 耐穿刺性	N	$\geq 8$
Elongation(CMD) 延伸性	%	$\geq 300$
Electrical Resistance 抗电阻性能	$\Omega \cdot \text{d} \text{m}^2$	$\leq 0.0010$ (standard) $\leq 0.0015$ (special)
Porosity 空隙率	%	$\geq 55$
B/W含油率	%	$\geq 8$
O/A含油率	%	$12 \leq X \leq 18$
Moisture content 含水率	%	$\leq 3.0$
Dimension stability 稳定性	%	$\leq 1.0$
Wetting time 浸透率	S	$\leq 60$
Acid weight loss 酸失重率	%	$\leq 4.0$
Fe content 铁含量	%	$\leq 0.010$
Ci content 氯含量	%	$\leq 0.030$
Reducing substance 还原性物质	ml/g	$\leq 10$

此外，我们可以提供工业隔板，玻璃纤维 PE 隔板，摩托车隔板。  
Also we can supply industrial separators,PE separators with glass mat,Motorcycle separators.



## 玻璃纤维复合防火层压板 Fiberglass Panel Laminate

绿色环保、防火等级高的玻璃纤维防火装饰板采用无纸化贴面，节约了大量的木材资源，增强了耐火性能及保温性能。其防火性能远优于纸质装饰板、木质板等材料，可广泛应用于需要防潮、防霉、防火和高强度的地方。

Fiberglass decorative laminate with Green Initiative、High Level Fireproof property is produced with out any paper, this research for us to save a lot of timber resource, at the same time enhance The panel's fireproof and thermal insulation properties. Fireproof performance of GFRP Panel is more better than paper lamination decorative panels and wood panels, it can be used for the place where waterproof、waterproof、fireproof and high intensity needed.



### 产品特点 Product Features&Application

- 防火性能
- 防水性能
- 耐磨损
- 抗化学性能
- 抗静电
- 易清洁，易加工
- Fire-proof
- Water-proof
- Wear-resistant
- Chemical resistant
- Anti-static
- Easy cleaning and fabrication

可应用于任何装饰表面：家具，隔间，卫生间隔断，火车车厢，汽车，橱柜，船舶，电梯，实验室台面，计算机机房地板，外墙等。  
It can be used on most of the decorative surface, such as Furniture, compartment, Toilet Cubical, train carriage, bus, cabinet, ship, lift, laboratory table, computer flooring, exterior and so on.

### 产品类别 Product range:

- 防火板
- 弯曲板
- 抗静电板
- 康贝特板
- 金属拉丝板
- 理化板
- High Pressure Laminate
- Post-forming Laminate
- Anti-static Laminate
- Compact Laminate
- Metal Laminate
- Chemical resistant Laminate

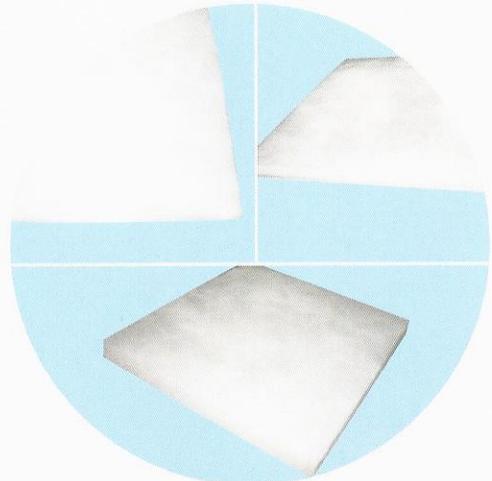


## VIP 板芯材 Core glass materials for Vacuum Insulation Panel

VIP 板芯材是由玻璃纤维为原料生产的，是近年开发的一种新型高效隔热材料，如果它采用真空隔热封装，在真空条件下，它的导热系数就会非常低，广泛作为冰箱、冰柜、冷藏车、冷库、冷冻冷藏集装箱、储冰槽等绝热系统的绝热保温材料。目前真空绝热板主要运用于冰箱领域，具有节能、壁薄和有效容积大等优点。

Vacuum insulation panel is made of glass fiber as raw material, is a new type of vibration insulation materials developed in near years. if it packed by vacuum insulation, in vacuum it will be got very low thermal conductivity, It widely used as a refrigerator, freezer, refrigerator car, cold storage, cold insulation container, ice storage reservoir slot insulation materials.

Now the vacuum insulation panel is mainly used in the field of refrigerator. It has the advantages of saving energy, thin wall and large effective volume



### 产品特点 Product Features

- 节能
- 壁薄
- 有效容积大
- Energy conservation
- Thin wall
- Large effective volume

### 技术参数 Technical Specification

导热系数 Thermal conductivity (m.k/w)	蓄热系数 Heat storage coefficient (m.k/w)	密度 Density (kg/m)	强度 Intensity (Mpa)	吸水率 Water absorption (kg)	防火等级 Fire-protection Rating
≤ 0.003	0.73	450	0.4	1.0	A级

