



中建材（合肥）新能源技术资料  
Technical Data of China National Building  
Materials (Hefei) New Energy Resources Co. Ltd.



## 1、产品简述（Product Overview）

中建材（合肥）新能源有限公司产品采用优质的低铁矿物原料和高纯度的化工原料，在特定的作业制度下，熔制成均匀度高，品质优良的玻璃液，利用德国鲁莱克斯（Rurex）公司成型设备和欧洲进口的镀膜设备，使之成为稳定的、高品质的玻璃产品。

China National Building Materials (Hefei) New Energy Resources Co. Ltd. uses efficient low-iron mineral materials and high purity chemical materials as raw materials, in a specific operating system, melting high uniformity and high quality molted glass, to obtain very stable and high efficient photovoltaic glass with molding equipment from the Germany Rurex company and coating equipment from the European company.

低铁含量的玻璃液，使玻璃对光谱吸收能力降低到更低；全氧燃烧技术应用可以提供玻璃熔化成型阶段的氧化条件，降低了玻璃液二价铁含量，达到化学脱色效果；特殊的绒面及布纹花型，提高了反射光载入几率，有效降低光线反射损失；有机纳米材料光学膜层提高了光线透过率；玻璃的物理强化过程，使产品赋予了较高的机械强度性能、热学性能和户外安全性能。产品在 PV 应用方面，可以承担起户外保护电池片不受破坏的职责和提高光能转换效率的职责。

Low-iron molted glass makes the glass down to the lower for the absorbing ability of the spectrum. The pure oxygen combustion technology provides the oxidizing conditions for the glass melting-molding stage, downing to the content of  $Fe^{2+}$ , to achieve the effect of chemical decolorization. The specific suede and fabric pattern is profitable for increasing the transmittance of incident light and decreasing the reflection loss of the light effectively. The application of the organic nano-material optical film enhances the transmittance of the light. Physical tempering of the glass improves the mechanical strength, thermodynamic property and outdoor safety performance. In photovoltaic filed, the product has been responsible for improving the efficient of light energy conversion and protecting the application safety of the outdoor solar cell.



## 2、产品品种（Product Category）



**Ultra White Patterned Annealed Glass**  
2.0mm/2.5mm/2.8mm/3.2mm/4.0mm  
Length<2000mm; Width<1000mm



**Ultra White Patterned Tempered Glass**  
2.0mm/2.5mm/2.8mm/3.2mm/4.0mm  
Length<2000mm; Width<1000mm



**Ultra White Patterned AR Coated Glass**  
2.0mm/2.5mm/2.8mm/3.2mm/4.0mm  
Length<2000mm; Width<1000mm

### 3、产品应用范围（Product Application Filed）

中建材（合肥）新能源有限公司光伏镀膜玻璃具有良好的光学透过能力和良好的机械及热学性能，使光伏组件具有优异的耐候性能和优良的光电转换效率，可广泛应用在光伏组件、光热设备和光伏建筑一体化系统。

The AR coated glass produced by China National Building Materials (Hefei) New Energy Resources Co. Ltd. has high optical transmission, mechanical property and thermal property. These make the photovoltaic module own the excellent weather resistance and photoelectric conversion efficiency. It's widely applied to the photovoltaic module, photo-thermal device and photovoltaic building integrated system.

### 4、产品的生产流程（Production Flow Chart）

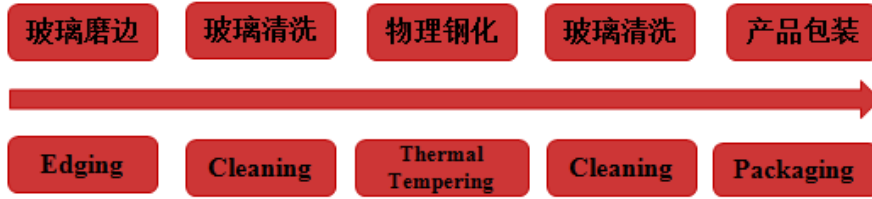
#### 超白压延光伏原片玻璃生产流程（Photovoltaic Raw Glass Flow）



#### 超白压延光伏镀膜玻璃生产流程（Photovoltaic Coating-Tempering Glass Flow）



## 超白压延光伏钢化玻璃生产流程（Photovoltaic Tempering Glass Flow）



产品通过严格的供应商管理、来料检验、精密的成分化验分析和物流控制，确保来料材料质量受控；通过对生产工序制程过程检验、包装前检验和发货前检验及运输前检验，确保不合格的产品不出厂。

The quality of the raw materials is ensured by the strict supplier management, incoming inspection, chemical composition of precision analysis and logistic control. The product up to the standard is ensured by the inspection of the production process and the inspection before packing, shipments and transportation, respectively.

## 5、关键生产工艺介绍（Key Production Process）

### 1) AR 镀膜工艺介绍（AR Coating Process）

采用成熟的溶胶凝胶法，利用进口先进的辊涂设备，在光伏玻璃上表面均匀涂上一层厚度约 110~140nm 有机纳米硅涂层，从而实现光伏玻璃降低反射率的作用。

辊涂设备主要关键部件有压辊、涂布辊、网纹定量辊、托辊、消痕辊构成。通过控制网纹辊目数、网纹辊和涂布辊间隙调节给液量，通过控制涂布辊速度控制膜层厚度，通过调节涂布辊高度控制膜层均匀性和涂布压力。

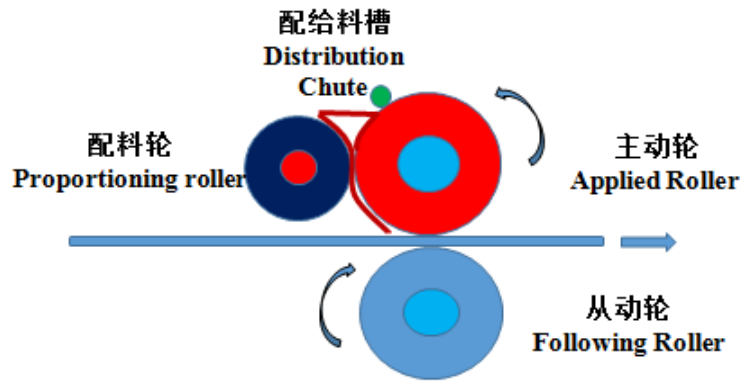
中建材（合肥）新能源有限公司镀膜玻璃基本技术参数为：良好的亲水性能和自洁性能、膜层厚度范围 110~140nm；膜层折射率范围 1.31~1.36；膜层硬度范围 3~6H。

In order to realize the reducing of the reflectivity for the photovoltaic glass, the ripe sol-gel method and advanced roller-coating equipment are applied, which coats a nano-organic silicon layer (thickness: 100~140nm) on upper surface of the photovoltaic.

The major critical component of roller-coating equipment is made up of the pressurizing roller, coating roller, anilox quantitative roller, carrier roller and clear-trace roller. The flux of coating solution is adjusted by controlling the mesh number of anilox quantitative roller and the gap between the anilox quantitative roller and coating roller. The film thickness is adjusted by controlling the rotate speed of coating roller. The film uniformity and coating pressure are controlled by adjusting the height of coating roller.



The technical parameters of coating glass produced by China National Building Materials (Hefei) New Energy Resources Co. Ltd. are as follows: good hydrophilic, self-cleaning property, film thickness rang 110~140nm, film refractive index range 1.31~1.36, film hardness range 3~6H.



## Roller Coating

### 2) 玻璃钢化工艺介绍（Glass Tempering Process）

玻璃钢化方法主要有两种：化学钢化 and 物理钢化。化学钢化是将玻璃半成品浸入到熔融钾盐中，玻璃表面与钾盐发生离子交换，使玻璃表面形成压应力层，使玻璃表面具有较强的防划伤、提高玻璃表面硬度和防火防腐性能；物理钢化是将玻璃在加热炉内加热至玻璃转变点上 50℃，通过对玻璃的快速降温，使表面质点来不及紧密排列，使冷却后的玻璃具有不均匀应力，从而使玻璃的机械强度、耐火、耐腐蚀能力得到了提高。

中建材（合肥）新能源有限公司采用国产先进的节能光伏玻璃连续钢化炉，对光伏玻璃进行强化加工，通过精密的 PID 温度控制方式，对钢化设备内进行矩阵式紧密控制，将玻璃均匀加热至 610~640℃，在强度为 11000~17000Pa 冷却风作用下进行强制冷却，使玻璃内部应力在 89MPa 以上，厚度为 3.2mm 以上的玻璃冲击碎片在 50\*50mm 范围内 40 颗以上。

The methods of glass tempering include two types: chemical tempering and physical tempering. Chemical tempering is that raw glass is put into the molten sylvite, then ions exchange between glass surface and sylvite, which forms compressive surface stress layer on the glass surface, improving the scratch-proof intensity, the surface hardness and refractory corrosion resistance performance. Physical intensify is that the raw glass is heated above the glass transition point 50°C, then rapidly cools to make surface particle not to closely arrange, which makes the cooling glass own non-uniform stress, improving the mechanical intensity, refractory and corrosion resistance performance.



The photovoltaic glass is physically intensified by energy-savingly advanced continuous tempering furnace made in China. Matrix tightly controlling is realized by the way of precise PID temperature control. The glass is heated uniformly to 610~640°C, cooled forcibly under the effect of cooling air that the intensity is 11000~17000Pa. The tempered glass that internal stress is above 89MPa and thickness is above 3.2mm contains above 40 fragments in the range of 50\*50mm when crushed.

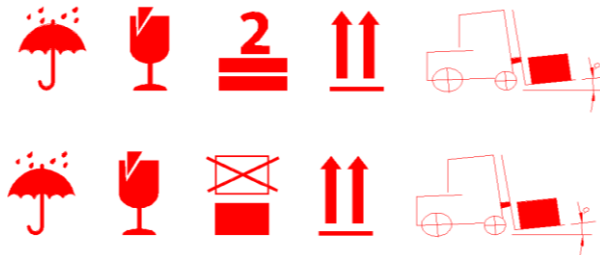
## 6、产品综合技术参数（Technical Parameters of the Product）

中建材（合肥）新能源有限公司产品综合技术参数

Technical Parameters of the Product Produced by China National Building Materials (Hefei) New Energy Resources Co. Ltd.

Physical and Chemical Property		Parameter
Thermal Property	Softening Point	725 °C
	Transition Point	510 °C
	Annealing Temperature	555 °C
Mechanics Property	Elasticity Modulus	73 Gpa
	Dilatation Coefficient	$9.05 \times 10^{-6} \text{ } ^\circ\text{C}^{-1}$
Chemical Property	Performance of high temperature and high humidity:85°C	No mildewy phenomenon less than 1000h
Optics Property	Iron Content	$\leq 120 \text{ ppm}$
	Raw Glass	$\geq 91.6\%$
	AR Coating Glass	$\geq 93.8\%$
	Thickness	2.0; 2.5; 3.2; 4.0mm

## 7、产品储存、运输条件及应用说明（Storage and Usage Notice）



玻璃易碎在储存和使用时一定要当心。储存时玻璃要放在必须存储在通风干燥洁净无积水的室内环境，并且此储存环境不得出现剧烈的温湿度变化，避

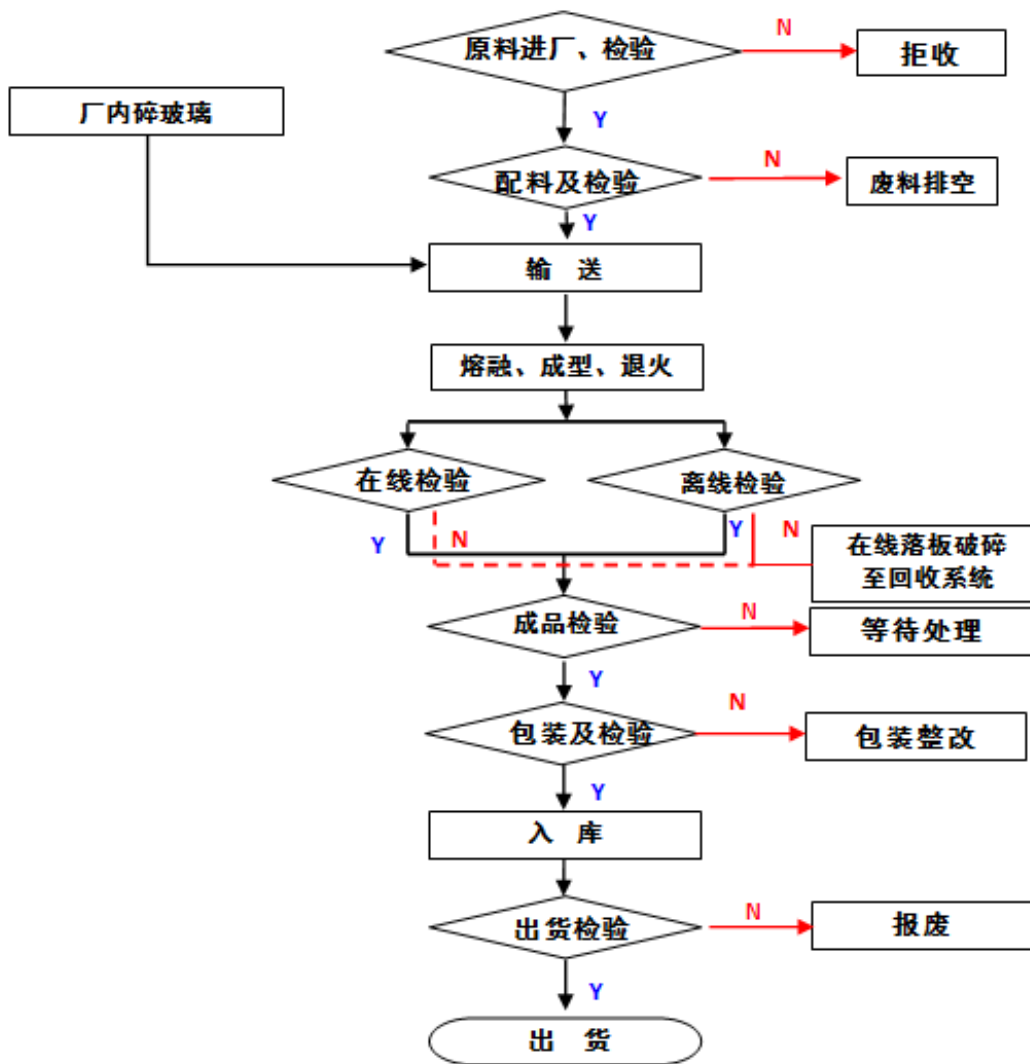


免包装受潮。堆放最多叠放2层，叉车取放玻璃时一定要注意控制速度和倾角（ $1^{\circ}\sim 5^{\circ}$ ），避开路面颠簸处，玻璃的取用管理按照先入先出原则，储存时间为3个月。

It's well-known that glass is fragile, and it's necessary to be stored and protected carefully. The standard condition for warehouse is to keep dry and clean where temperature and humidity don't change suddenly to avoid damp. The stack maximum is 2 pallets. The speed and angle of inclination ( $1^{\circ}\sim 5^{\circ}$ ) are controlled when the worker drives forklift to pick or place glass. The Glass manage should follow the FIFO policy, and the storage time is 3 months.

## 8、产品质量控制流程（Quality Control Process）

超白压延光伏原片质量控制流程图（Quality Control Process of the Raw Glass）







超白光伏压延镀膜玻璃质量控制流程图（Quality Control Process of the AR Coating Glass）

