



镀膜玻璃光伏组件的清洁

Cleaning Methods of ARC-Glass of Photovoltaic Modules

本手册是晶科光伏发电组件的减反射镀膜玻璃（简称“镀膜玻璃”）清洁的详细说明。

This manual is a detailed description for cleaning the anti-reflection coated glass (referred to as ARC-glass) of Jinko's photovoltaic solar modules.

随着时间的推移，泥土和尘埃会累积在组件的玻璃表面，降低组件的输出功率，晶科公司建议定期清理组件表面，确保最大输出功率，特别是在低降水的地区。

With the passage of time, dirt and dust may accumulate on the glass surface of the module, reducing the power output of the module. Jinko recommends regular cleaning of modules to ensure maximum power output especially in low rainfall areas.

综合说明：

Detailed description:

切勿用裸露的手指或没带手套的手去触摸或处理组件的玻璃表面。要带干净的手套以避免指纹和其他污物留在玻璃表面。指纹可能无法从镀膜玻璃表面清除。

Don't use bare fingers or hands without gloves to touch or handle the glass surface of modules. Wear clean gloves to prevent fingerprints and other dirt from staying on the glass. Fingerprints may not be able to be removed from the ARC-glass.

不允许使用金属工具，如刀片、刀、钢丝棉和其他研磨材料。

It is not allowed to use metal tools such as blades, knives, steel wool and other abrasive materials.

可以使用各类软的泡沫材料，如无纺布，掸子，软海绵，软笔刷，毛刷。



All types of soft foam materials, non-woven fabrics, whisks, soft sponges, soft brushes and hair brushes may be used.



图示海绵的蓝色硬面只能用来清洁组件的铝边框。若用蓝色的硬面清洁玻璃会擦伤镀膜玻璃。

The blue hard surface of the sponge shown in the figure can only be used for cleaning the aluminum frame of modules. Cleaning the glass with the blue hard surface will scratch the ARC-glass.

毛刷规格要求:

Hair brush specifications:

毛刷专用丝的材质: 尼龙丝 1010;

Materials of special wires for hair brushes: nylon wire 1010;

清洁镀膜玻璃毛刷专用丝直径要求: 0.1-0.06mm

Required diameter of special wires for hair brushes for cleaning ARC-glass:
0.1-0.06mm

各种类型的商业玻璃清洁剂、酒精/乙醇/甲醇也是可以使用的。

All types of commercial glass cleaners, alcohol/ethanol /methanol may also be used.



Glass Cleaner

不能使用研磨粉、研磨料清洁剂、洗涤剂，抛光器，氢氧化钠、汽油、亚硝酸稀释剂，酸或者碱等化学物质。

Do not use abrasive powders, abrasive cleaners, scrubber cleaners, polishers, sodium hydroxide, benzene, nitro-thinners, acid or alkali and other chemical substances.

清洗用水的压力应小于 690KPa，也就是大多数城市市政供水。不推荐使用高矿物质含量的饮用水，因为其中的矿物质当水干后会沉积在玻璃表面。

The pressure of the cleaning water should be less than 690KPa, i.e. most municipal water used as cleaning water. It is not recommended to use water with high mineral content as it may deposit on the glass surface when the water is dry.

不使用蒸汽或者腐蚀性的化学制品来加快清洗。

Do not use steam or corrosive chemicals to speed up the cleaning.

不要尝试去清洁破裂的玻璃或者有线路破损暴露出电线的组件，这样会有电击的危险。

Do not try to clean broken glass or module with broken lines or exposed wires, as



it may cause electric shock.

1. 清洗时间的选择

Selection of cleaning time

组件玻璃的清洗工作应选择在清晨、傍晚、夜间或阴雨天进行。同时在早上或晚上清洗的时候，必须选择阳光不强烈的时段。

The module glass cleaning should be done in the early morning, in the evening, at night or on rainy days. At the same time, when cleaning in the morning or evening, select the period when sunshine is not strong.

2. 清洗周期和区域的规划

Planning of cleaning cycle and region

如果是大型光伏电站，由于占地很大，组件数量庞大，而每天适宜进行清洗作业的时间又较短，因此光伏电站的清洗工作应规划清洗周期并根据电场的具体情况划分区域进行，以用较少的人力完成清洗工作。

For a large-scale photovoltaic station with large floor area and a large number of modules, the time appropriate for the cleaning operations is short each day; it is necessary to plan the cleaning cycle and divide regions according to the specific circumstances of the electric field so as to complete the cleaning work of the photovoltaic station with less manpower.

组件清洗工作中子区域的划分应按照光伏电站的电气结构进行，应确保每次的清洗工作能够覆盖若干个汇流箱或逆变器所连接的所有组件。

The subregion division in the cleaning work should be carried out according to the electrical structure of the photovoltaic station, and should ensure that each of the cleaning work can cover all components connected to a number of combiner boxes or inverters.

3. 清洗的常规步骤



Routine steps of cleaning

步骤 1: 掸

Step 1: Whisking

用干燥的掸子或抹布等将组件表面的附着物如干燥浮灰、树叶等掸去。如果组件表面没有其他附着物并通过本步骤已清洗干净，则可免去进行下面的步骤。

Deposits such as dry floating dust and leaves on the module surface should be whisked off with a dry whisk or cloth. If there are no other deposits on the module surface, and the module has been cleaned in this step, the following steps may be dispensed with.

步骤 2: 擦拭

Step 2: Scraping

如果组件上有紧密附着其上的硬性异物如泥土、鸟粪、植物枝叶等物体，需要使用无纺布或毛刷擦拭，不能使用高硬度的器物进行刮擦，也不要轻易刮擦没有附着硬物的区域，做到清楚异物即可。

If there is hard foreign matter such as dirt, bird droppings, plant branches, leaves, etc., closely attached to the module, the module should be scraped with non-woven fabric or hair brush and must not be scratched with high-hardness objects; if the foreign matter is removed, do not scratch regions without hard deposits.

步骤 3: 冲洗

Step 3: Washing

如果组件表面有污染物质如鸟粪的残留物、植物汁液等，或场内空气湿度很大灰尘无法掸去，则需要通过清洗来去除。一般用清水来清除，将清水喷到有污染物的区域后，用毛刷擦拭去除。

If there are colored substances such as bird droppings, plant juices, etc., on the modules surface, or dust that cannot be whisked off due to high indoor humidity, the colored substances need to be removed by cleaning. The colored substances are generally removed with clean water by spraying the clean water onto the region with pollutants and scraping with a hair brush.



如遇油性物质,可使用调有酒精的水涂在染色区域,等溶液将污染物渗透后,用毛刷擦拭去除。

Oily substances, if any, may be removed by coating water blended with alcohol onto the colored region and scraping with a hair brush after the solution penetrates through the pollutants.

必要时可使用商业玻璃清洁剂连同无纺布对组件进行最后的清洁工作。

If necessary, the module may be cleaned with commercial glass cleaner, together with non-woven fabric.

4. 清洗雪

Cleaning of snow

晶科公司的组件在设计的时候考虑到能承受较高的雪压。然而,如果需要清理积雪,以提高输出功率,请使用毛刷轻柔的去除雪。但是不要试图清除在组件上冷冻的雪或冰。

Jinko modules are designed to be withstanding high snow pressure. However, if you need to clear snow to improved output power, use a high brush to gently remove the snow. But do not try to remove frozen snow or ice on the modules.

