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Contact Us

Tel: +86-752-3916136

Fax: +86-752-3916139

Mob: +8618153799089

Whatsapp: +8615918309135

Email: eric@xintaifb.com (mailto:eric@xintaifb.com)

Email: andy@xintaifb.com (mailto:andy@xintaifb.com)

Add: QinFeng Industrial Zone, DongFeng Village, XinXu Town, HuiYang District, HuiZhou City, GuangDong Province, China.

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Why does the electrostatic electret effect of melt blown fabric not last long?

- Apr 23, 2022 -

In recent days, mask production and melt blown spunbond non woven fabric production industry are unprecedented hot. With the development of the industry, the production capacity of melt blown nonwoven on the market has been greatly improved. The meltblown cloth above 90 in the market can now be bought everywhere, which also forces the meltblown cloth manufacturers to do it at a higher end. Grade 95 and 99 meltblown cloth are the production objectives of the current manufacturers.

According to some melt blown non woven fabric manufacturers, the normal product sampling of the factory production line fully meets the melt blown cloth standard of level 95, and the production of high standard and the formal standard of level 99 can also be realized. However, when the melt blown cloth is delivered to the customer after being stored in the warehouse for a few days, during sampling and testing, the melt blown cloth is only level 90 or even level 80, and the customer is furious. After the melt blown cloth is stored, the electrostatic electret standard decreases. What is the reason?

The filtration efficiency of melt blown non woven is a complex system engineering, which involves the product material, product process, electrostatic electret process and so on of melt blown wire, and also has a great relationship with the storage environment. How to avoid the decline of electrostatic effect of grade 95 melt blown fabric? We should do a good job from the following three aspects.

1. Permanent electret masterbatch shall be selected

Electret is charging. The melt blown nonwoven fabric passing through the electret initially reached 95 +, but the consideration effect fell down after a few days, mainly due to the extremely unstable electrostatic field and the attenuation of charge.

At present, there are three kinds of electret masterbatch commonly used: Production by electric stone method, production by gas silicon method, and fatty acids containing nitrogen chemicals.

The three types of electret masterbatch have their own advantages and disadvantages. The electret masterbatch produced by gas silicon method has high efficiency and good durability. It basically belongs to permanent power storage, easy to disperse, non-toxic and tasteless. It can pass FDA certification, which has more advantages in general.

The polarization of electrets made of non-polar materials is mainly caused by space charge. There are two types of space charges: one is called the same number charge, and the other is called the different number charge. The former is attributed to the conductivity between the dielectric and the electrode or the electric breakdown near the dielectric surface under the action of strong electric field, which makes the electrode inject charge into the dielectric; In this way, the polarity of the injected space charge is the same as that of the adjacent electrode. The polarity of different sign charges is opposite to that of adjacent electrodes, which is mainly due to the separation and capture of charges in the dielectric. The electret charge formed by dipole orientation in polar dielectric is another type of different sign charge.

2. Electret equipment should use positive charge

The dust, bacteria and viruses in the air are attached to the particles and are mainly negatively charged. The melt blown cloth is positively charged and is easy to adsorb these negatively charged particles.

Electret equipment should use positive charge instead of negative charge. Because there is a positive charge on the cloth, it can absorb the negative charge in the air. When the melt blown cloth is in contact with the skin, the negative charge is easier to be consumed. If it has a positive charge, it will be lost more slowly.

According to the engineer of an electrostatic equipment, the test shows that 15-50kv is the best, and the discharge distance is 4-8cm.

If the applied voltage is too high, such as more than 50kV, it is easy to destroy the molecular structure of polypropylene. If it is too close, arcing sparks will break through the melt blown cloth. If it is too far away, the charge will escape everywhere due to scattering, which will waste a lot of charge and cannot be stationed in the master batch, resulting in insufficient electrostatic field of the cloth.

It should be noted that some equipment are marked as 120kv, and the actual output voltage is only more than 23 kV.

High power electrostatic melt blown electret equipment

The electret energy has a wide adjustable range and the power adjustment range is 0-1200w

Output electret voltage adjustable range 0-60kv

Output electret current 0-20mA

Real time liquid crystal display electret voltage and current

With start button and adjustment button, it is convenient to operate

With an emergency stop switch, the output of emergency fault can be terminated by one button to improve safety

It has the functions of automatic fast arc detection and fast arc extinguishing to ensure the safe and uninterrupted operation of melt blown cloth to the greatest extent

It has the function of quick protection of molybdenum wire breakage in discharge to ensure safety and effectiveness of electret.

With output electret overvoltage, overcurrent and over-power protection.

Truly practical electrostatic electret generator

3. Melt blown fabric shall be sealed in time to avoid moisture regain

The meltblown nonwoven has strong electrostatic adsorption capacity, and the dust and water vapor in the air will be continuously adsorbed by the meltblown cloth. Environmental problems greatly affect the charge retention of melt blown cloth.

Therefore, the temperature and humidity in the workshop should be monitored at all times, and corresponding equipment should be added to keep the temperature and humidity in the workshop within a certain range.

After the meltblown spunbond nonwoven is produced, it should be packaged in time, preferably vacuum packaging, dry storage, and can not be in contact with the outside wet air. Avoid moisture regain and dirt.

In addition, special attention should be paid to that the meltblown non woven fabric produced by different machines should not be put together, which will affect each other and neutralize the charge.

Huizhou Xintai nonwoven Co., Ltd. is a project cooperation enterprise, which is approved and registered by relevant departments. The company is mainly engaged in functional non-woven fabrics such as 10g-200g spunbonded non-woven fabrics, polypropylene non-woven fabrics and PP non-woven fabrics. The company is located in Qinfeng Industrial Park, Dongfeng Village, Xinwei, Huizhou, Guangdong, China.

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(mailto:eric@xintaifb.com)

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