

## Nonwoven mask using "ELITOLON™ X" leads easy to breath.

Make the extremely comfort mask that reduces "discomfort" and "difficulty in breathing" inherent in masks.

Generally, nonwoven mask is superior to other materials in terms of preventing the spread of droplets. On the other hand, difficulty in breathing and associated discomfort still remained issues that existed as trade-offs.

Mr. A in the Product Development Department of Company B obtained several samples of the melt blown nonwoven fabric currently in use, developed and evaluated the prototype, but the performance was not as good as expected.



At that time, Mr. A heard about the reputation of Toyobo MC's "ELITOLON™ X" from an agency. TOYOBO MC was the first company in the industry to release activated carbon fiber about 40 years ago (TOYOBO at that time). It entered the filter field with products that applied the fiber, and it was now highly trusted as a professional.

"ELITOLON™ X is a non-woven fabric with high charging density, heat-resistant charge stability, low pressure loss, and high collection efficiency. We have received many consultations from advanced companies, and have already used dust filters for air purifiers. We thought that if we made a mask out of this nonwoven fabric, we could maintain the effect of preventing droplets without compromising the ease of breathing." (Mr.A)

Mr.A evaluated the prototype using samples of the "ELITOLON™ X". As a result, it was found that the collection efficiency was higher than that of conventional melt blown nonwoven fabrics, while the pressure loss was lower than that of conventional melt blown nonwoven fabrics. They tried it in the product development department, and everyone was surprised that it was easy to breathe and comfortable. In the evaluation of the user test, many people said that they wanted to use it every day and buy it, so they decided to use the "ELITOLON™ X" as the next nonwoven mask.

### ELITOLON™ X

An electrostatic (electret) filter developed by combining our company's unique advanced polymerization technology and fiber production technology with electrostatic charging technology.

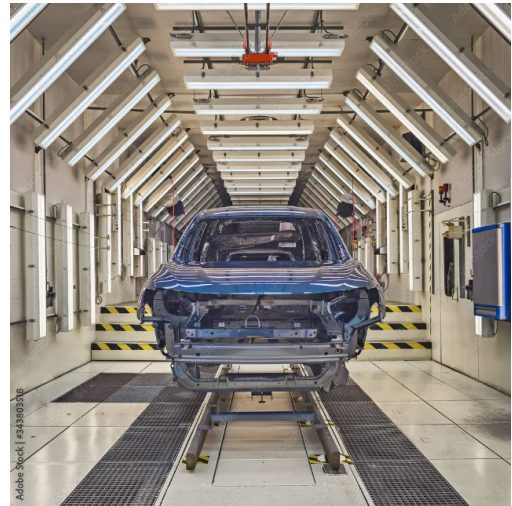
Since the microfiber retains static electricity, dust in the atmosphere can be effectively collected, and high collection efficiency can be achieved with low pressure drop.

## Prefilter made of 「ELITOLON™ R」 to suppress the clogging of the exhaust treatment device. Replacement period tripled

Reduce the running cost of the exhaust treatment equipment, maintaining safer measures of the factory.

Company Z introduced a commercially available exhaust treatment system when it added a new coating process for exterior components. However, it was revealed that the medium-performance filter located in the front stage of the exhaust treatment system clogged earlier than expected, resulting in a higher replacement frequency.

Mr. T, an engineer in Z's production engineering department, considered lowering the output of the exhaust system to reduce the load that the paint mist places on the medium-performance filter. "However, after a trial operation, the exhaust capacity decreased, and the paint mist concentration in the factory exceeded the internal standard. This would jeopardize the safety of the workers." he said.



Mr.T who was struggling to cope. At that time, I hear a case of pre-filter from Toyobo MC. The idea was to accurately grasp the particle size of the paint mist, and to place a pre-filter (a filter made of "ELITOLON™ R", a charged non-woven fabric) which is optimal for the particle size in the front stage of the medium performance filter.

They immediately installed a pre-filter made of "ELITOLON™ R" in the front stage of the medium performance filter, and conducted the test. The results were clear, and clogging of the medium performance filter caused by increasing the output of the exhaust device was greatly reduced. Even after several days of testing, the replacement cycle was increased by three times. In addition, this measure did not increase the concentration of paint mist, so the level of safety measures could be maintained firmly.

The decision was made to install pre-filters made by "ELITOLON™" on all paint lines, as this greatly reduced running costs and ensured safety.

### ELITOLON™ R

An electrostatic (electret) filter developed by combining our company's unique advanced polymerization technology and fiber production technology with electrostatic charging technology.

Since the microfiber retains static electricity, dust in the atmosphere can be effectively collected, and high collection efficiency can be achieved with low pressure drop.

### A charged non-woven fabric filter with 50% reduced ventilation resistance. To reduce electricity bills and CO2 emissions by 1.5 million yen per year

Reduce the load of the air conditioning system and reduce the frequency of filter replacement.

Company C is set to increase production amid rising demand for electronic components around the world. The company expanded its production lines and clean rooms, but faced two major challenges.

"The air conditioning system for the expanded clean room is at full capacity with high output. As a result, the amount of electricity used exceeded the planned amount, resulting in more fixed costs than expected. Energy-saving and CO2 reduction targets at factories became difficult to achieve." (Mr. T, Group Manager, Manufacturing Department, Company C)

Furthermore, due to continued full operation, the ventilation resistance of the medium-high performance filter increased faster than expected, and the frequency of filter replacement increased. Each time a temporary line outage occurred, resulting in increased downtime.



When Mr. T consulted with the air-conditioning staff of a group company, he was introduced to Toyobo MC and received a proposal for a medium-high performance filter using "ELITOLON™ AT" electrified nonwoven fabric. According to the test data, "ELITOLON™ AT" had a ventilation resistance 50% lower than the same medium-high performance filter as Company C using conventional glass filter paper.

Mr. T immediately conducted a test run using an ELITOLON™ AT filter as one of the air conditioning systems. The power output was adjusted to achieve the same air volume as before, and the system was operated for several days to confirm that it could operate at a lower power output (power) than before. After several months of operation in this condition, the increase in ventilation resistance was suppressed, the frequency of replacement was reduced, and the increase in downtime was eliminated.

In addition, it was found that if all medium-high performance filters were replaced with "ELITOLON™ AT," electricity bills and CO2 could be reduced by approximately 1.5 million yen per year.

#### ELITOLON™ AT

An electrostatic (electret) filter developed by combining our company's unique advanced polymerization technology and fiber production technology with electrostatic charging technology.

Since the microfiber retains static electricity, dust in the atmosphere can be effectively collected, and high collection efficiency can be achieved with low pressure drop.

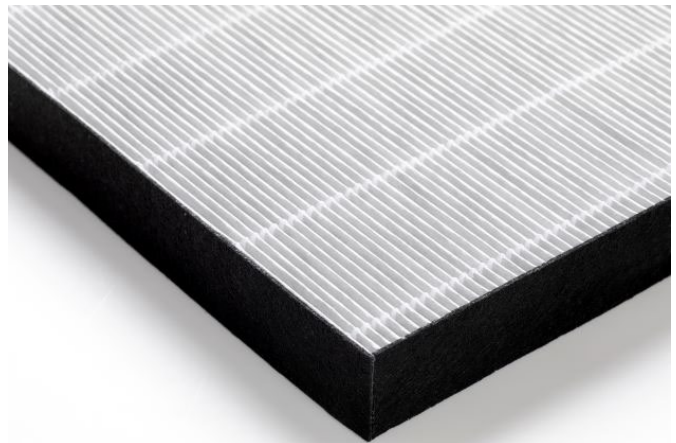
### The pleating process of the filter under higher temperature condition leads the collection efficiency to 99.95%!

#### Growing Need for Air Purifiers

Meet the demands of consumer electronics manufacturers with the expansion of production capacities!

As the need for high-performance air purifiers increased, Company E was offered by a consumer electronics manufacturer with a forecast that exceeded the existing production capes. Due to the delivery period, there was no time to expand their equipment.

"Generally, filters for air purifiers have a pleated filter material are heated to retain their shape. The pleating speed can be increased by raised heat temperature, but the prototype did not meet the quality standard. We had an agreement with the consumer electronics manufacturer to reduce the collection efficiency to 99.9%, but no matter how many times we prototype the product, we could only achieve 99.8% (0.2% penetration). " Mr.M who belongs the design and development department of Company E said.



With regard to the speed increase, the retention of the pleated shape was weak at conventional machining temperatures, resulting in an increase in ventilation resistance. On the other hand, it was also found that the collection efficiency decreased due to temperature when machining at high temperatures to enhance the shape retention. They tried using various filter materials and the results were the same.

After that, Mr. M consulted with the person in charge of TOYOBO MC who had a business with another filter material and learned about "ELITOLON™ X heat-resistant formula". "ELITOLN X heat-resistant formula" is a filter material that can maintain its performance even at higher processing temperatures. This enables pleating at high temperatures.

Immediately, when evaluated with a pleated sample at high temperature, it achieved a 99.95% ( penetration 0.05% ) that far exceeds the target even for post-processing dust collection efficiency measurements.

The fact that the penetration rate has improved significantly and they have achieved our goals at once strongly encouraged members of the Design and Development Department.

#### ELITOLON™ X

An electrostatic (electret) filter developed by combining our company's unique advanced polymerization technology and fiber production technology with electrostatic charging technology. Since the microfiber retains static electricity, dust in the atmosphere can be effectively collected, and high collection efficiency can be achieved with low pressure drop.

## The latest filter media "ELITOLON™ XC" Improves electrostatic force and improves filter performance balance

Assumed to be a small and medium-sized restaurant.  
Raises its air volume, maintaining dust collection efficiency.

Company R develops the next model of commercial air purifier with the concept of strengthening ventilation measures in winter. Since it was targeted at relatively small-scale eateries and clinics, They thought of making a filter that could emphasize raised air volume while maintaining the dust collection efficiency rather than the spec of the air purifier.

"Although we proceeded trials with commercially high performance filters and some filter media, every prototype didn't reach the target air volume at maximized operation air volume." Mr.M ,who belongs product development department of R Company, said.



The embarrassed Mr.M though of TOYOBO MC that gave advice to him about filter processing.

The latest filter material, ELITOLON™ XC, was provided by TOYOBO MC. Compared to conventional electrostatic filters, this product has dramatically increased electrostatic force, and the index of filter performance balance (ventilation resistance and collection efficiency) is approximately 1.3 times that of conventional filters.

Mr.M and his colleagues and TOYOBO MC immediately started working on prototype production. As a result, they found that the filter has performance above expectations. That put them on track to improve its air purifying speed while keeping conventional dimension of the air purifier.

Base on those results, "ELITOLON™XC" was defined as a filter for the next model. In addition, Company R and TOYOBO MC undertaked to develop an energy saving air purifier with redesigning the fan to take advantage of the characteristic of "ELITOLON™ XC"

### ELITOLON™ XC

An electrostatic (electret) filter developed by combining our company's unique advanced polymerization technology and fiber production technology with electrostatic charging technology. Since the microfiber retains more static electricity than our conventional grades , dust in the atmosphere can be more effectively collected, and high collection efficiency can be achieved with lower pressure drop.