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(English available)

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Announcement on the newly developed technology of functional inorganic nano-particle fixation and its commercialization

NBC Inc. announced today (as a results of an action by directors on 26th of January 2006) the following resolution to commercialize the products based on their newly developed technology of inorganic nano-particle fixation.

1. Background of development

NBC Inc. has a corporate sense of responsibility for contributing environmental conservation for the allover society. Our products such as percolation fabric and filter mesh were developed in accordance with our company policy "Be Clean, Soft and Safe for Human being and Earth." To further those goals, we concentrated our research on the fixing nano-particles on plastic material to elicit their hidden potential, leading to our exiting new development.

2. Outline of new technology

We have successfully developed the new technology fixing inorganic nano-particles on the surface of plastic material or its molding of percolation fabric, filter mesh and the like.

Up to now, it was common to use a method of mixing nano-particles with binding resin or filling nano-particles in plastic material so as to fix inorganic nano-particles. But in this common method nano-particles are covered with the resin or the material, or immersed in them so that the nano-particles seldom perform their own inherent function. (see Fig. 1)

Our new technology developed can solve the above problems. In our distinguished technology, nano-particles bind each other chemically, and bind with the surface of plastic material chemically in conjunction with the binding agent adopted onto the surface of nano-particles. (see Fig. 2) The technology also enables nano-particles to be assembled into the shape of island layers, continuous mono-layer or continuous multi-layers (see Fig. 3) depending on intended purpose.

The dust-control properties of products manufactured utilizing this new technology are remarkable {see Fig. 4; Fig. 4-(a), Fig. 4-(b)}. Tiny particles of soil or sand and fine powder such as flour or pollen (see Fig. 5) are easy to extract from the products, and accumulations are easily removed by simply tapping lightly.

Additional properties include high solvent resistance; high adhesion onto the products (almost 4 time higher than that of the layer fabricated with common dry process) (see Fig. 6); multi-functionality; and the inherent characteristics of nano-particles, such as bactericidal, antibacterial, negative ion generation, super hydrophilic, near infrared cut-off, and the like.

Hence our new products can be applied to a wide variety of industrial applications such as vacuum cleaners, air purification equipment, air conditioners, filters for automotive filters, flyscreen, mosquito net, percolation fabric, and pavilion tent in addition to optical filters, ventilation filters and so on.

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3. Difference between common method and newly developed technology

3.1 Explanatory schematic for the new technology

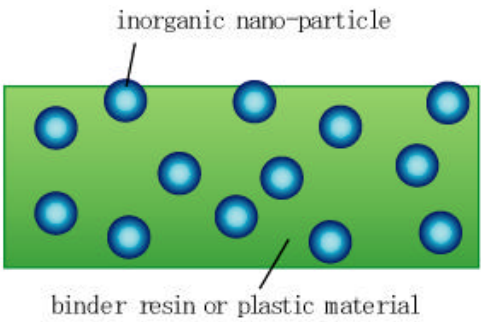


Fig.1 Common method

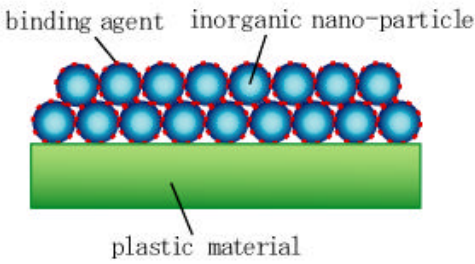
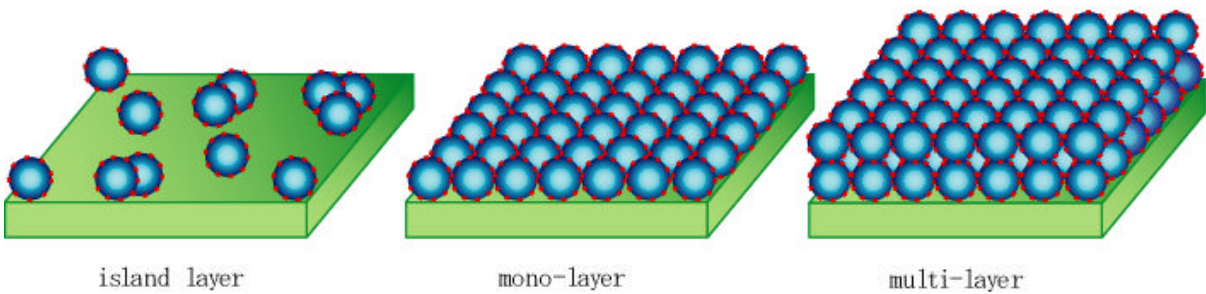
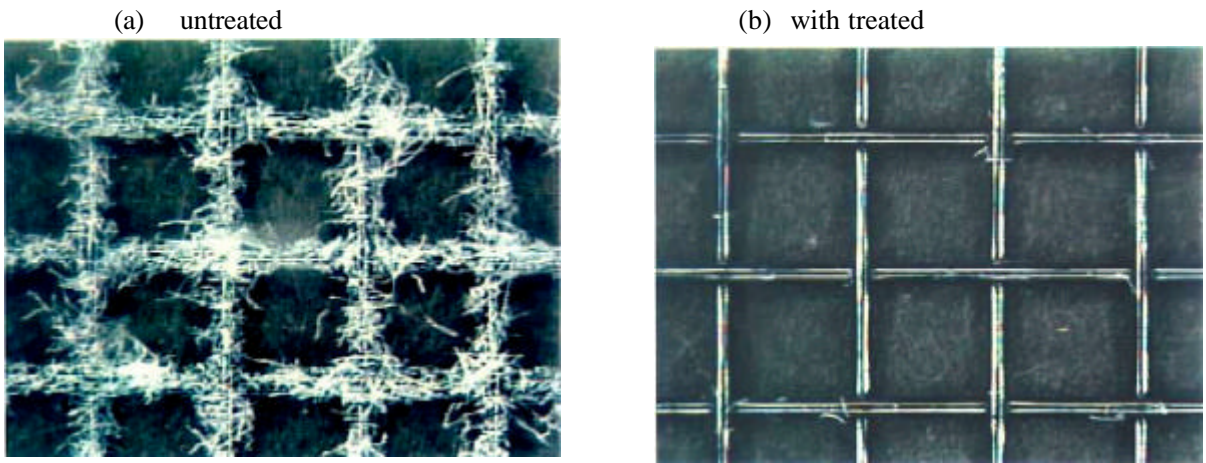


Fig.2 New Technology



Fi.3 nano-particle assembling

3.2 Comparison of Dust control Performance (easy to take out from polyester mesh; in case of Cotton Lint)



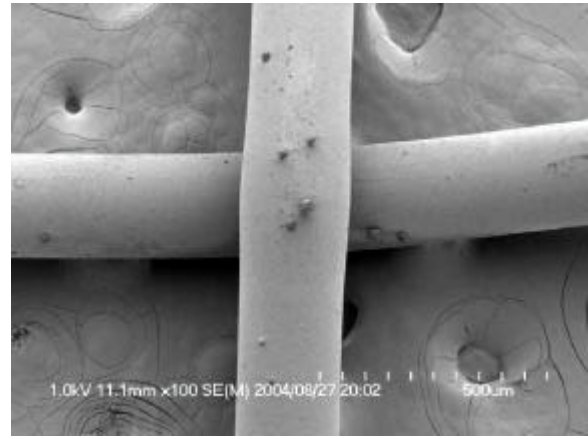
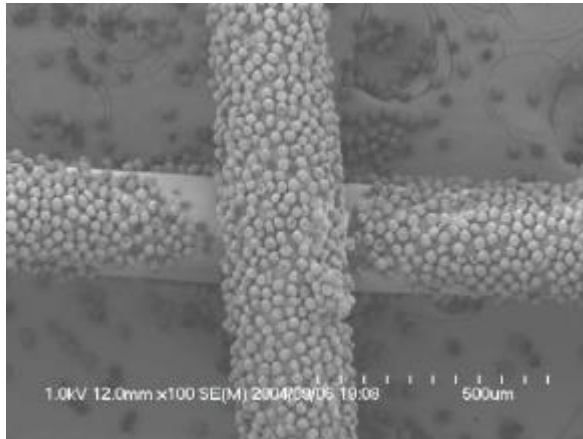
[Fig. 4] Dust Control difference between untreated and treated by the new technology

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3.3 Comparison of Dust control performance (easy to take out from polyester mesh; in case of Pollen)

(a) Untreated

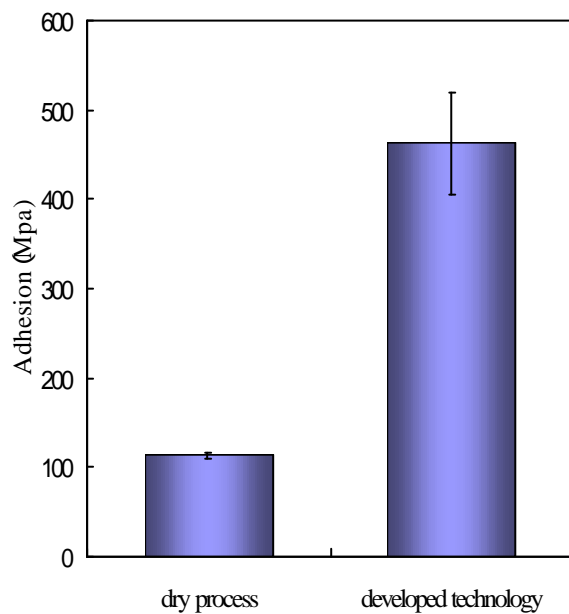
(b) Treated



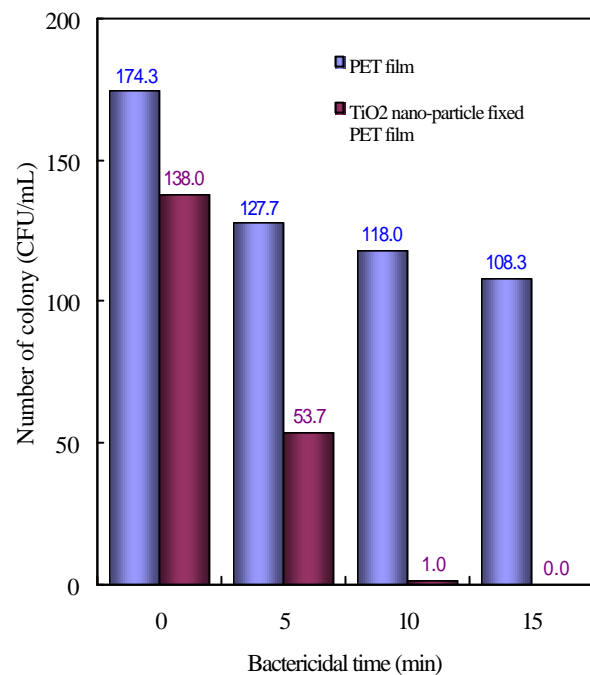
[Fig. 5] Dust control difference between untreated and treated by the new technology

3.4 Comparison of Adhesion

3.5 Bactericidal comparison (in case of coli bacteria)



[Fig. 6] Comparison of adhesion between dry process and the new technology



[Fig.7] Bactericidal test between untreated and treated

Bactericidal test was done with collaboration of Prof. Matsunaga of Tokyo University of Agriculture and Technology

4. Patent application

12 patents applied (9 overseas)

5. Expense for the commercialization of the new technology

Facilities investment: 600million Yen

6. Impact to sales performance

Estimated sales amount of the newly developed products

100 million Yen in 2006, 3 million Yen in 2007, 7 million Yen in 2008

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