

May 2020

komatsumateRe

Reusable eco-friendly mask Dantotsu Maskool™ released

Providing comfort in a mask with various features:

cool touch, prevention of stuffiness, deodorizing, washing durability, antiviral, antibacterial deodorizing effect, pollen and UV light cut

■ Offering sustainability and a comfortable in-mask environment

We have been developing masks offerings comfortable wearing conditions as well as being fashionable, since we regard masks as a fashion garment consisting of an outer and under part. We began the development of masks and mask inserts so that mask users could feel comfortable when wearing them. Furthermore, we developed washable and reusable masks with the global environment in mind, not disposal masks like non-woven fabric masks.

We will continue to provide fashionable and functional masks that also offer sustainability and comfort.

■ Development process of Dantotsu Maskool™

We have been collaborating with Toshiba Materials Co., Ltd. for over one and a half years to develop a new photocatalytic material that exerts an oxidation decomposition effect on viruses. We released products under the brand name Dantotsu Fit Inner™ in February 2020. Subsequently, we developed new masks named Dantotsu Maskool™ with various features.

Dantotsu Maskool™ masks feature a cool touch, virus control and prevention of stuffiness, providing comfortable wearing conditions, meaning they can be worn in any season. In addition, our original Vegi-vegi™ material, which is derived from plants, features antiviral, deodorizing, pollen and UV prevention and odor elimination functions.

Furthermore, they are eco-friendly and sustainable since they can be used repeatedly after 50 times of washing. The sale of Dantotsu Maskool™ masks started on June 3, 2020. We also sell them together with Dantotsu Fit Inner™ (5 pcs.) at a reasonable price.



Photo: Dantotsu Maskool™ external appearance
(Left: outer surface, Right: inner surface with a pocket for mask insert)

■ Features of Dantotsu Maskool™

1) Cool touch maintains a cool environment inside the mask

Dantotsu Maskool™ offers a countermeasure against heatstroke, since users feel cool when their skin touches the mask surface. When heat from the skin is transferred to the material, a cooling sensation is created. The heat transfer amount is indicated by the maximum heat absorption speed “q-max” (W/cm²). The higher the q-max, the cooler people feel. Ordinary cool touch cloth has a q-max of approximately 0.2 W/cm², whereas Dantotsu Maskool™ offers a q-max of 0.38 W/cm², more than 1.5 times higher. (See Fig. 1: Cool touch (q-max) comparison)

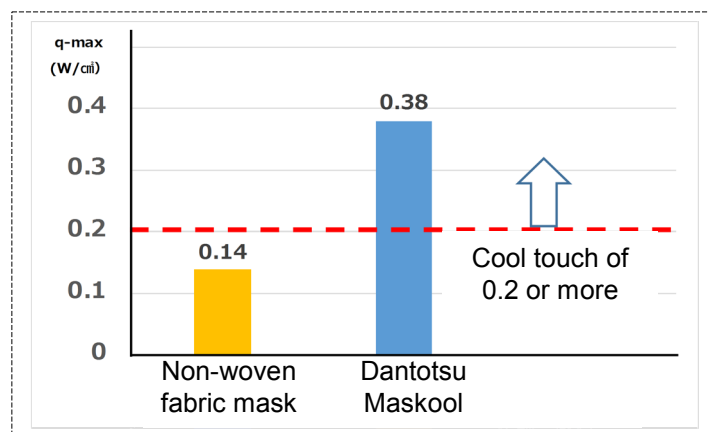


Fig.1: Cool touch (q-max) comparison

2) Stiffness-preventing moisture absorption and release

When we wear a mask for a long time, the air inside the mask becomes humid, resulting in rough skin. Dantotsu Maskool™ provides a moisture absorption and release property in order to prevent stiffness inside the mask. The mask absorbs moisture and releases it from the outer surface, preventing stiffness.

[Reference data: (1) Cool touch]

As Fig. 2.2 and 2.3 below show, Dantotsu Maskool™ suppresses temperature increase by approx. 2°C compared to a non-woven fabric mask.

[Face surface temperature change due to wearing a mask (measured by thermograph)]

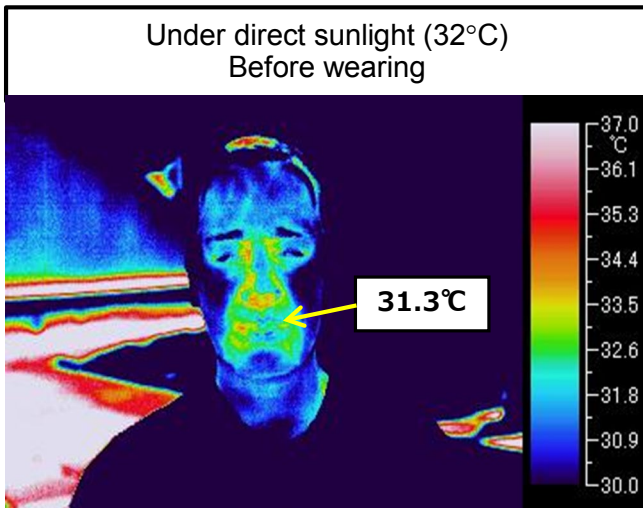


Fig. 2.1: Measured under direct sunlight

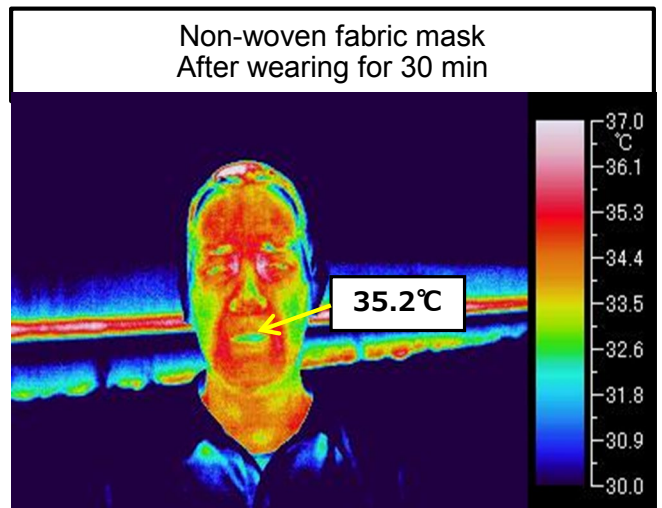


Fig. 2.2: Measured after wearing a non-woven fabric mask for 30 min

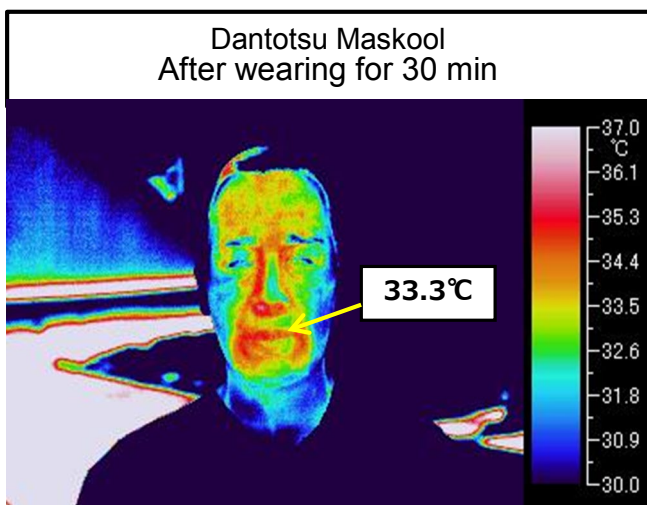


Fig. 2.3: Measured after wearing Dantotsu Maskool for 30 min

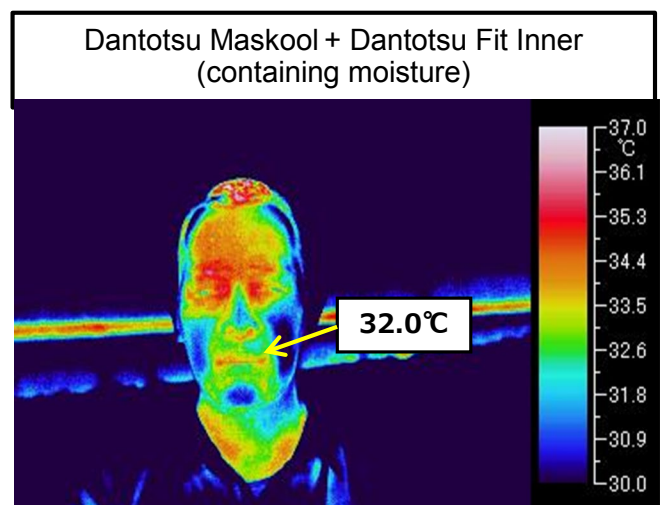


Fig. 2.4: Measured after wearing Dantotsu Maskool with Dantotsu Fit Inner for 30 min

The combination of Dantotsu Maskool and Dantotsu Fit Inner (containing moisture) increases the cool touch effect due to the cooling effect of vaporization heat, which is an excellent countermeasure against heatstroke. As you can see from the thermograph measurements in Fig. 2.2 and 2.4, use of Dantotsu Maskool and Dantotsu Fit Inner suppresses the temperature increase by approx. 3°C compared to a non-woven fabric mask.

3) Deodorizing effect

We confirmed the deodorizing effect against volatile Sulphur compounds such as hydrogen sulfide and methyl mercaptan, which are the causes of bad breath. (See Table 1: Deodorizing effect against the main components of bad breath)

Table 1: Deodorizing effect against the main components of bad breath

		Initial density	Density after 2 hrs	Deodorization rate
Hydrogen sulfide	Dantotsu Maskool	20ppm	4ppm	80%
	Non-woven fabric mask	20ppm	18ppm	10%
Methyl mercaptan	Dantotsu Maskool	6ppm	1ppm	83%
	Non-woven fabric mask	6ppm	5ppm	17%

4) Outstanding washing durability — An eco-friendly mask

Dantotsu Maskool™ maintains its functions even after 50 handwashes, due to its outstanding washing durability. This is an eco-friendly sustainable mask, not a disposable non-woven fabric mask.

5) Excellent antiviral property — Fast virus decomposition, even under broad area faint light

VIRUS SHIELD® processing controls virus activity via photocatalytic action. This is a breakthrough technology for fast virus decomposition. It is effective even under faint light, since it features a wide wavelength reaction range; from UV to visible light. An influenza virus contact test for VIRUS SHIELD showed a 99% reduction effect over a six-hour period.

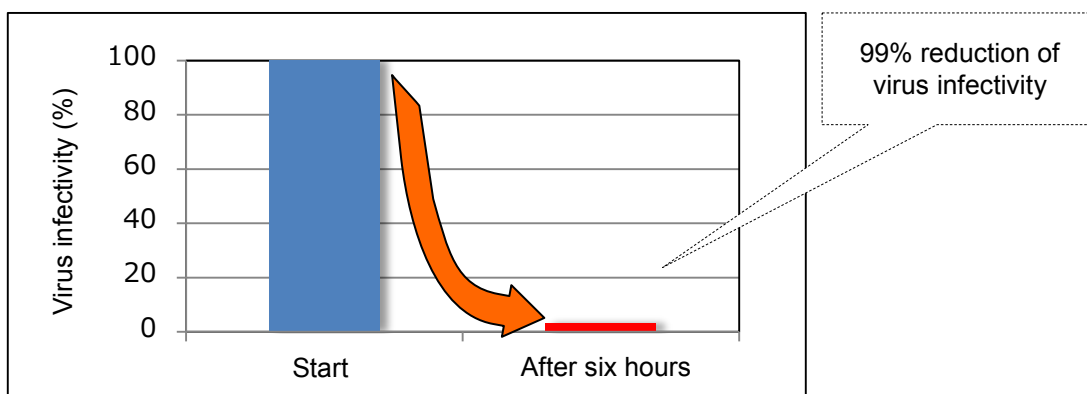


Fig. 3: Influenza A virus subtype H3N2 control effect (Brightness: 1,000 lux - daytime indoor brightness level)

Evaluation results provided by Japan Textile Products Quality and Technology Center

[Effect when combined with Dantotsu Fit Inner™]

The combination of Dantotsu Maskool and Dantotsu Fit Inner provides a double blocking effect against viruses. Furthermore, insertion of a Dantotsu Fit Inner into the pocket of the Dantotsu Maskool creates a space between the mask and mouth, increasing air permeability and enhancing the refreshing effect.



Photo: Dantotsu Fit Inner™ external appearance

6) Antiviral and deodorizing effect via dyeing technology

We developed the new Vegi-vegi™ material, which has features derived from plants. Our dyeing technology is used to produce a material including natural ingredient chitosan, which has an antiviral and deodorizing effect.

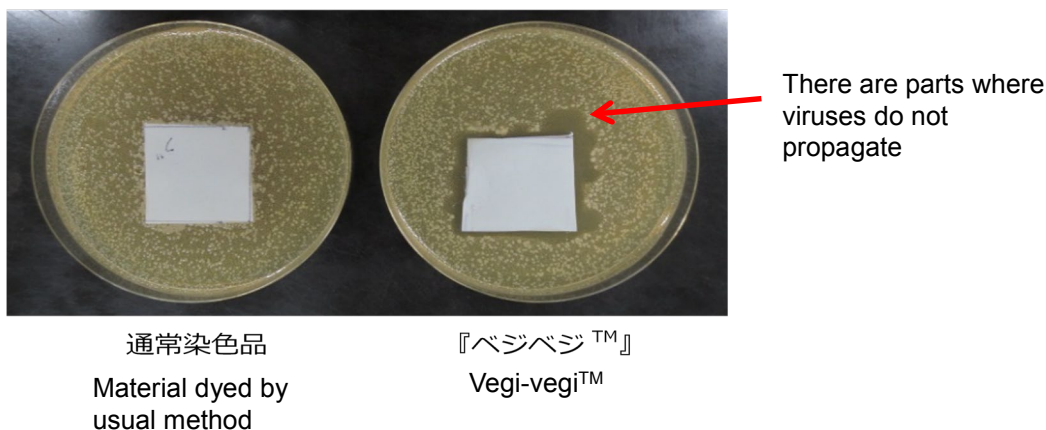


Fig. 4: Antibacterial effect against Staphylococcus aureus

[SEK Mark Certification] * Orange mark: bacteriostatic treatment

Dantotsu Maskool™ is treated by hybrid processing of silver-based bacteriostatic treatment*¹, for which we already obtained the SEK mark. This product meets the SEK mark (orange: bacteriostatic treatment) standard.

*Treatment that controls bacterial increase by means of silver ions



7) Hay fever prevention

Hay fever affects many people. Dantotsu Maskool™ filters pollen from the air via a high density material.

8) UV light reduction

Dantotsu Maskool™ cuts sunburn-causing UV light by 99%. In addition, it is class 40 UPF (ultraviolet protection factor), which is considered to also affect the skin.

Table 2: UV reduction capacity (UV intensity: 2.3mW/cm²)

	UV cut rate
Dantotsu Maskool	98.9%
Dantotsu Maskool + Dantotsu Fit-inner	99.9%

■ Application of Dantotsu Maskool™ technology

After releasing Dantotsu Maskool™ on May 29, 2020, we will expand the application of the technology used in Dantotsu Maskool™ to the following fields:

Lifestyle materials, hospital and nursing care materials (sheets, pillow cases, curtains), vehicle interior materials, bedclothes, interior materials, uniforms, etc.

■ Dantotsu Maskool™ marketing plan

Dantotsu Maskool™ will accept orders from June 3, 2020. Purchase together with the Dantotsu Fit Inner™ (5 pcs.) represents excellent value. We will be able to deliver the products from June 15, 2020. The product details are shown below:

[Color/ Size/ Material]

- Color: White
- Size: S (for children), M (for adults)
- Material: Nylon 85%, Polyurethane 15%

[Price] *excluding tax

- Dantotsu Maskool (1pc.) JPY 1,500
- Dantotsu Fit-inner (5 pcs.) JPY 1,500
- Dantotsu Maskool (1pc.) & Dantotsu Fit-inner (5 pcs.) JPY 2,500 /package

[Sales Target]

- We anticipate sales totaling one billion yen for the first year.