

## The Joint Presentation by Our Group Company TKS Industrial Company and Nippon Paint Automotive Coatings Co., Ltd. Received the Jury's Award at the International Conference on Automotive Body Finishing: SURCAR 6TH AMERICAN CONGRESS

- There Was High Praise for Our Dry Decoration Technology, Which Can Be Used for Integral-type Bumpers with a Height of 700 mm or More and a Large Curvature -

The International Conference on Automotive Body Finishing: 6th SURCAR 2023 in Detroit is one of the most prestigious international conference in the painting industry. It was held on June 21 and 22, 2023 in Detroit, and TKS Industrial Company (Head Office: Troy, Michigan, USA; President: Robert Booth III), a group company of Taikisha Ltd. (Head Office: Shinjuku-ku, Tokyo, Japan; Representative Director & President: Masashi Osada), gave a presentation entitled "Dry Film Coating: New Generation Coating Method in Automotive Manufacturing" jointly with Nippon Paint Automotive Coatings Co., Ltd. (Head Office: Hirakata City, Osaka, Japan; Representative Director & President: Satoshi Nishimura). This presentation, given by TKS Industrial Company's Joel Campbell and Nippon Paint Automotive Coatings Co., Ltd.'s Ayako Iwakoshi, received the Jury's Award, which is granted to the presentation that receives the highest evaluation from the judges.



Dry decoration technology can reduce greenhouse gas (GHG) emissions because it renders conventional coating processes unnecessary by using a film decoration and application technology. However, it has faced issues including the limited sizes of the objects to be decorated as well as applying films to complicated shapes with reduced color tone changes and without wrinkles.

The technology introduced in the presentation received high praise for realizing dry decoration even on integral-type bumpers with a height of 700 mm or more and a large curvature without wrinkles and with reduced color tone changes by controlling the film extension percentage to 100% or less, and the presentation received the Jury's Award.

## ■ What is the International Conference on Automotive Body Finishing: SURCAR?

SURCAR is an international conference where the leaders of the automotive industry and suppliers from around the world gather and exchange opinions through presentations on the latest technologies under the theme of technologies specialized in automotive paint finishing.

This conference takes place every year in one of three locations: the USA (Detroit), Europe (Cannes), and Asia (Shanghai).

The conference program consists of keynote speeches, expert presentations, panel discussions, networking sessions, and more. With the cooperation of the International Technical Committee of surface treatment experts, there are discussions focusing on paint and equipment innovations, new clean technologies, the development of surface treatment, and feedback on and benchmarks for equipment, materials, and processes, as well as solutions for sustainability and environmental issues.

## ■ About the Jury's Award



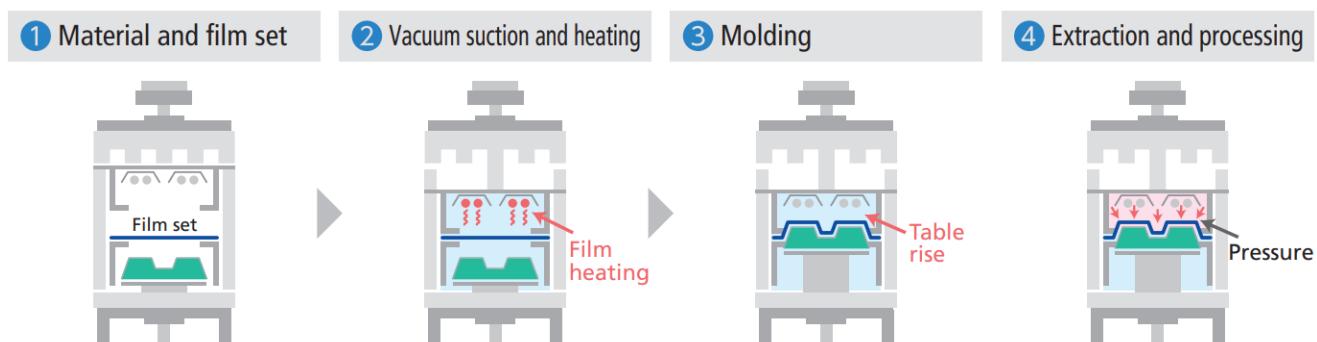
Judges vote to determine the recipients of the Innovation Award, the Technique Award, and the Jury's Award, and of these, the Jury's Award is given to the presentation that receives the highest praise. There are presentations on a total of 15 themes, and only one receives this award. This time, the presentation entitled "Dry Film Coating: New Generation Coating Method in Automotive Manufacturing" received high praise for the realization of dry decoration on integral-type automotive bumpers with a large curvature and a

complicated shape without wrinkles and with reduced color tone changes. This earned it the Jury's Award.

## ■ What is dry decoration technology?

◆ Dry decoration technology provides the exteriors of automobiles with film decoration (dry decoration) by applying films through vacuum suction and heating instead of the conventional spray coating (wet coating). This technology enables the addition of functionality (solar cells, heat shielding, etc.) and the expansion of the designability inherent in decorative films, such as patterns, decorations, and illumination.

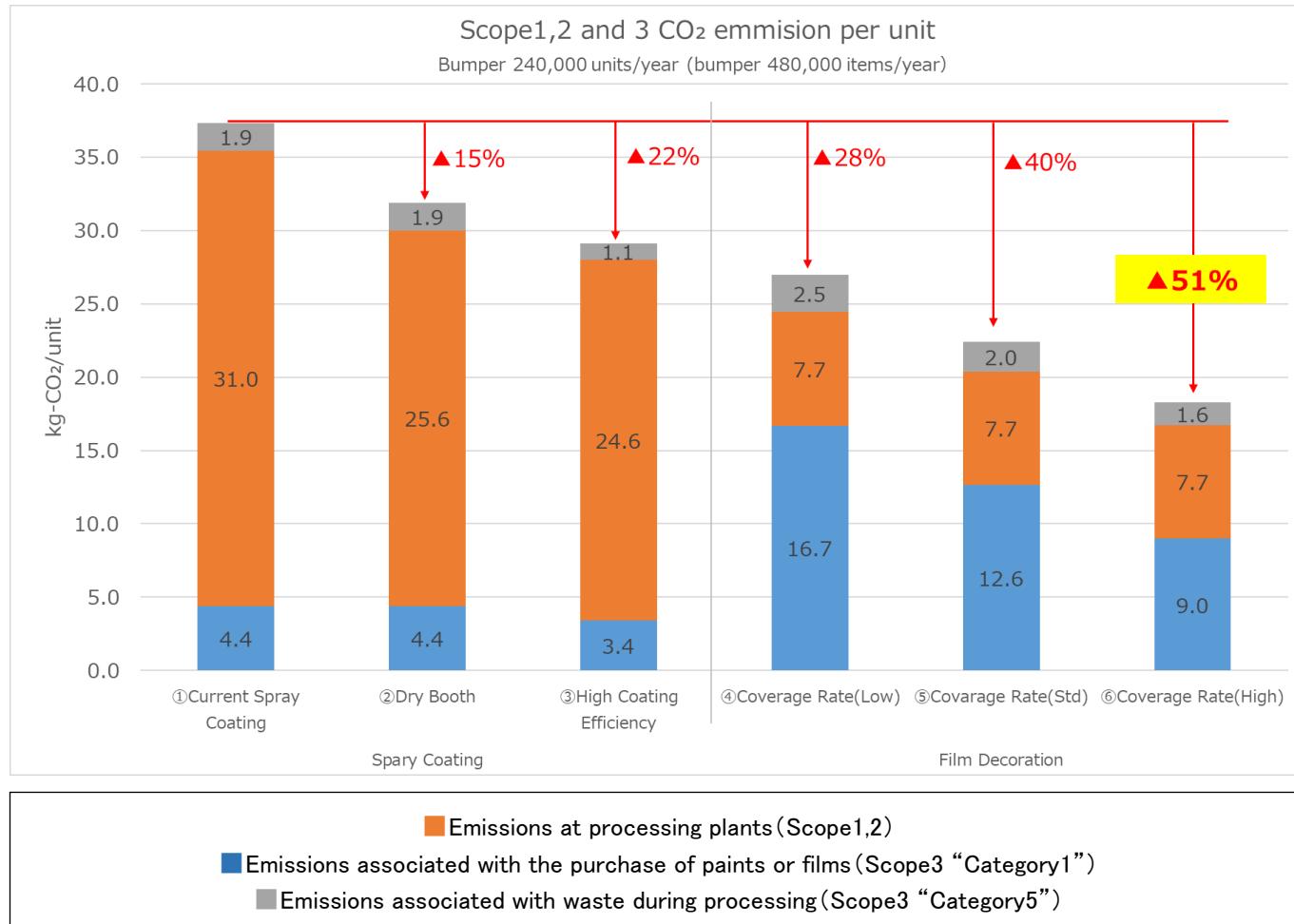
Decorating film vacuum molding system



◆ Conventional wet coating generally involves the repetition of electrodeposition, intermediate coating,

and top coating. In contrast to wet coating, in which coating and drying are repeated in the process of recoating, high-coverage film decoration (dry decoration) can significantly reduce energy consumption in direct emission (Scopes 1 and 2) at a processing plant compared to conventional coating using paint, achieving a reduction of 50% or more. In the future, we can expect further reductions in CO<sub>2</sub> emissions by realizing innovations in processes, such as recycling the base materials of coated objects and film substrates, in the upstream and downstream (Scope 3) sections of processing plants.

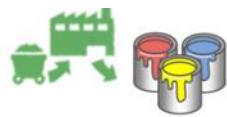
\*Coverage: Surface area to be coated / Area of film to be used (%)



### [Effect of reducing greenhouse gas (GHG) emissions with dry decoration technology]

#### Upstream side emissions

##### at processing plants (Scope3)



- Reduce material usage
- Reduce emissions from material manufacturing process
- Recycle materials



#### Direct emissions

##### at processing plants (Scope1,2)



- Low energy process
- Reduced footprint of process (Compared to the wet (coating) decoration line, the dry (film) decoration line reduces the total floor area by 83%, the building volume by 80%, and the lead time by 80 %.)

#### Downstream side emissions

##### at processing plants (Scope3)



- Improving fuel economy by reducing product weight
- Contributing to the popularization of electric vehicles by providing high-value-added components (decorative and light-emitting films, decorative solar panels, etc.)

## ■ Dry decoration realized on integral-type bumpers with a large curvature without wrinkles and with reduced color tone changes

By adopting a three-dimensional vacuum pressure thermoforming (TOM) method, the film can also be used for something that has been an issue for conventional dry decoration technologies, decoration (application) on complicated solid shapes with irregularities, three-dimensionally without wrinkles and with low extension.

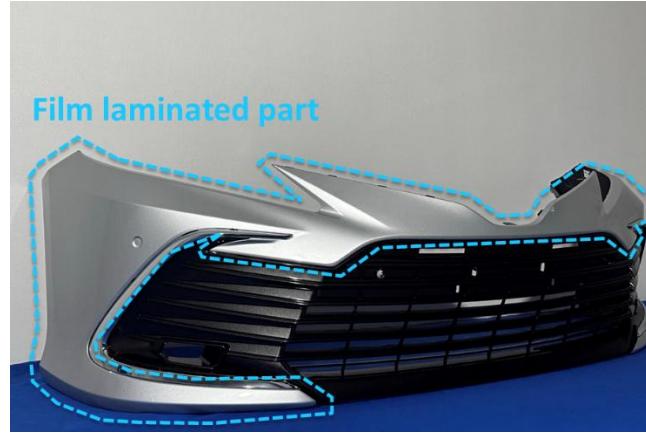
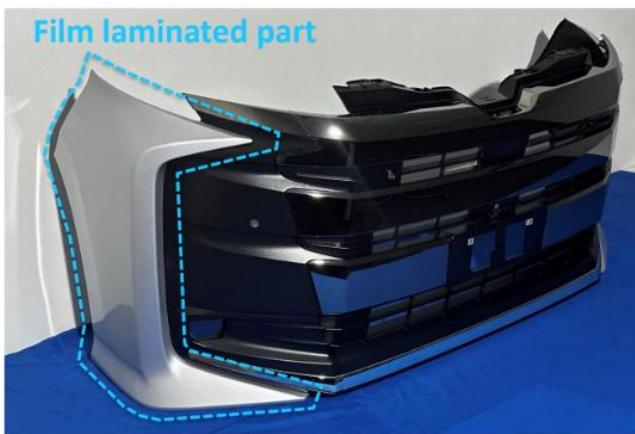
The three-dimensional vacuum pressure thermoforming (TOM) method is a film decoration and application technology developed by Fuse Vacuum Forming Co., Ltd. (Head Office: Habikino City, Osaka, Japan; CEO: Tsutomu Yabuki), and it is the world's first technology that can be used three-dimensionally for decoration (application) of films on solid shapes with irregularities.

Past devices that used the TOM method were capable of applying films only to coated objects with a height of 200 mm or less. This time Taikisha developed the device exclusively in collaboration with Fuse Vacuum Forming Co., Ltd, and made it possible to use the TOM method of applying films to integral bumpers with a height of 700 mm or more and a large curvature.

This made it possible to apply films to large, complicated solid shapes with irregularities, such as integral-type bumpers for passenger cars, with low extension (film extension percentage: 100% or less), and to realize dry decoration with reduced color tone changes and without wrinkles.

## ■ Trial results

Bumpers are decorated with a silver metallic film by Nippon Paint Automotive Coatings. It can be adapted to complicated three-dimensional shapes. It can also be used to coat both separated parts and integral-type parts.



## ■ Future business development

In order to establish a dry decoration process, we are currently conducting verification from various perspectives, using bumpers as a case example. We are also planning to build a demonstration line in our research facility for a dry decoration system assuming a mass production line. We are determined to continue focusing our energy on developing dry decoration technologies that can contribute to realizing a decarbonized society and to provide higher value for automotive exteriors.

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