

The background of the slide is a grayscale image of a car's front wheel. The wheel has a multi-spoke alloy design. A portion of the wheel, including the spokes and the tire's contact patch, is highlighted with a semi-transparent red overlay, indicating the application of the WFO product.

WFO[®] Reduces CO₂ Emissions

WFO[®]でCO₂排出量低減

 TOKAI RIKAI

Background

A combination of an aluminum frame and WFO[®] was developed to satisfy the CO₂ reduction target, as part of carbon neutral efforts.

Existing problems

1. A different aluminum wheel is needed for each vehicle model.
 - Extra aluminum is used for decoration beyond what's needed for strength.
 - Increase in part numbers
2. The general way of decorating WFO[®] is painting, which is a high-CO₂-emitting method.

Purpose

Ultimate weight saving

Aluminum wheel as a platform
(pursuit of function)
【Aluminum frame】

WFO[®]

Aesthetic appeal
Aerodynamic function

WFO[®] embodies aesthetic design
(Metal ⇒ Resin)

Flexible aesthetic design

Resin WFO[®] enables various
formation and decoration
methods for aesthetic design

What is WFO[®]?



Aluminum frame + **decorated resin WFO[®]**
Separation of functions from **visual design**

Benefits

Less CO₂ emissions due to

(1) Lightest aluminum wheel frame

(2) Paintingless decoration

The use of less aluminum contributes to weight saving and better aerodynamic performance.

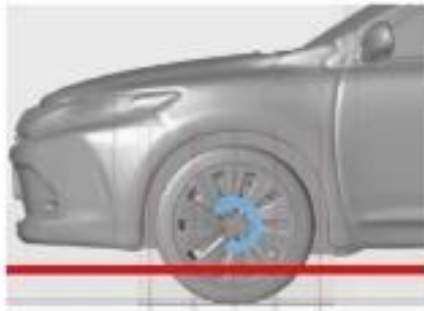
Lightweight wheel
with no aesthetic design



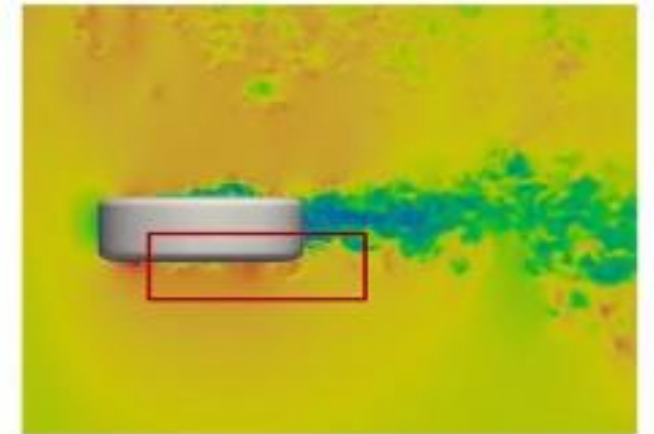
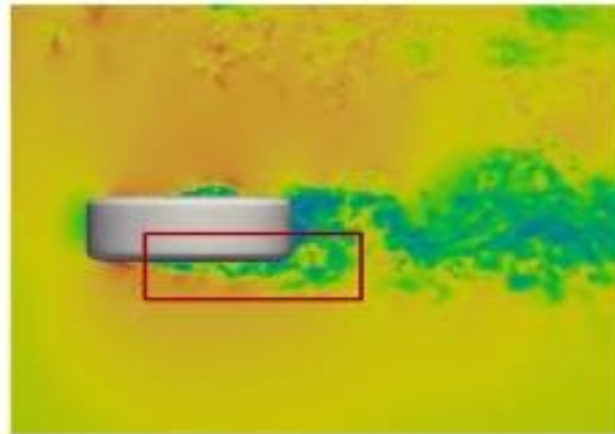
WFO and lightweight wheel
with no aesthetic design



Comparison of flow
speed distribution
(TR analysis)



Cross section



Benefits

Less CO₂ emissions due to

(1) Lightest aluminum wheel frame

(2) Paintingless decoration

Technology

Paintingless decoration method



Lightweight wheel

ORIGINAL



SPORT



URBAN



ACTIVE



Paintingless film



Designs and patterns are transferred onto the surface of a solid object.

Carbon pattern gradation



A film is transferred by heat and pressure.

A dimple pattern is reversely transferred.

Pre-colored material (bioengineering plastic)



Pre-colored material is molded

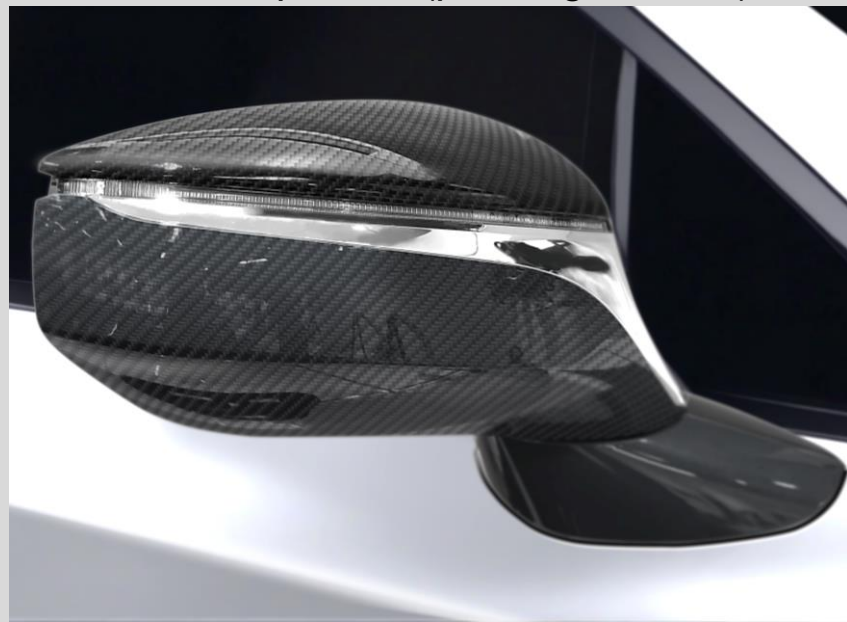
Suggestion of
possible applications

WFO®



Mirror

Carbon pattern (paintingless film)



Ornament

Metal hairline finish (paintingless film)



Garnish molding

Piano black (pre-colored material)

