

CUSTORIM

Bora Sen
2017194

Introducing the Custorim Rim System – a pioneering merge of engineering and design

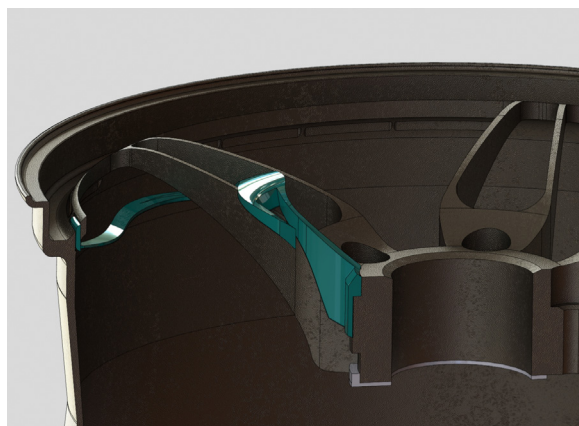
At the heart of Custorim's innovation is a **forged, high-strength, lightweight Base Rim (CB1)** crafted from either **magnesium** or **aluminium** alloy. This base rim is perfected with **advance machining methods**; CNC machining, Tumbling and powder coating.

A **user-friendly attachment system** embedded onto this rim, enables assembly of the base rim seamlessly with our **revolutionary Additional Spoke Series**. Made from **UV-resistant coated, 3D-printed, mixed-recycled ABS plastic**, these additional spokes push the boundaries of design and function!

Custorim has been developed with the intention of effectively integrating visual appeal with functionality.

Our innovative system facilitates extensive customization through interchangeable spokes that are not load-bearing.

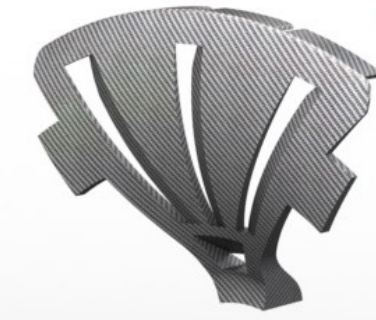
This engineering solution makes it possible for designers to express their creativity in ways that would not be achievable with traditional rim designs, all while maintaining efficiency and safety.



The core of Custorim's user-friendly appeal lies in its simple yet sophisticated attachment system.

Embedded directly into the base rim, this system is crafted using advanced CNC machining and forging techniques, ensuring a perfect fit and easy interchangeability.

Whether you choose the robust 6061-T6 aluminium or the high-performance Elektron 21® magnesium option, each rim is engineered to effortlessly connect with our customizable ABS plastic spokes and can be used without the Custorim Additional Spoke sets while maintaining its durability!



CB-1
FORGED

Materials
Elektron 21® / 6061-T6
Magnesium / Aluminium



CS-F/P/C Series
3D Printed

Material
ABS Plastic
Mixed-Recycled

Customization Journey

Users begin by *selecting the base rim material*, Elektron 21[®] magnesium for enhanced performance or 6061-T6 aluminum for daily reliability. Next, they *choose a powder coat color and finish* for the base rim.

The journey continues with the *selection of additional spokes* from three distinct series; Performance(CSP), Futuristic (CSF), or Classic (CSC), tailored to meet aesthetic preferences or performance objectives.

Finally, users have the liberty to select from an array of *colors and finishes for the ABS plastic additional spokes*, made possible by the versatility of 3D printing technologies and supplementary finishing methods.

Aesthetic and Functional Customization

Custorim provides many base rim and spoke *finish and colour options* to suit personal taste and performance.

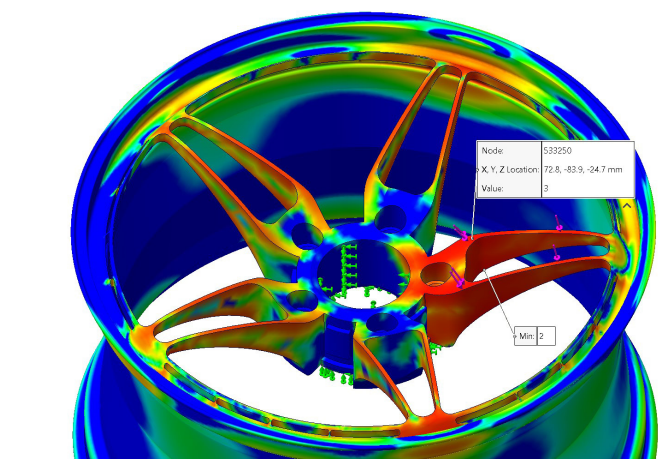
Every option, *from vivid colours to smooth matte finishes*, is intended to improve aesthetic appeal and withstand environmental factors, guaranteeing long-lasting beauty and functionality.



FEA and Factor of Safety Testing

After comprehensive FEA analysis and Factor of Safety testing, the base rim in both magnesium and aluminum variations *successfully withstood the tests* under forces of up to **5000N** (500kg) per spoke.

These tests validate the durability and safety of both magnesium and aluminum base rims, confirming their ability to withstand real-world driving conditions!



User Interaction

Custorim’s additional spoke sets are designed for effortless self-assembly, allowing users to customize their rims quickly and independently whenever desired!

The assembly process is straightforward:

Step 1: Fastening the Extra Spokes

Begin by inserting the outer slot of the additional spoke into the pre-designed cavities around the rim’s circumference. This step ensures that the spokes are securely fastened, protecting against accidental detachments due to external elements like wind or water.

Step 2: Finalizing the Attachment

Attach the central section of the spoke to the rim’s body near the centre disc. This dual-point connection—both at the rim’s outer edge and centre—ensures each spoke is doubly secured, providing enhanced stability and uniform force distribution.

Step 3: Ensuring Uniform Distribution

Repeat the attachment for all five spokes per rim, adhering to a consistent sequence to maintain balance and uniformity across the wheel.

Manufacturing Processes

Custorim Base Rim

- 1. **Material Selection**
- 2. **Forging Process;** (Enhancing its mechanical properties and durability.)
- 3. **Trimming**
- 4. **Heat Treatment;** T6 heat treatment to further improve rims tensile strength and resistance.
- 5. **CNC Machining;** Precision machining creates sleek, dual-divided spokes, bolt holes, and slide attachment mechanism on the base rim.
- 6. **Finishing;** Tumbling, Brushing, Powder Coating



Custorim Additional Spokes

1. Material Preparation

A blend of 80% virgin ABS material and 20% recycled ABS is prepared, ensuring both sustainability and material quality.

2. 3D Printing (FDM)

For intricate designs and customization. The layer resolution may vary to achieve the desired finish quality.

3. Automatic Support Removal;

Submersed Vortex Cavitation (SVC)

Removing support structures from 3D prints is a delicate and time-consuming manual process that risks damaging the parts.

4. Tumbling

5. Color and Finish Customization

