



A Best Design Practice: Lightweighting

The design practice of lightweighting is more important now than ever. Electric vehicle manufacturers in particular are looking to reduce the overall weight of their vehicles to increase battery life. Other manufacturers want to rethink parts where weight is the main driver of cost.

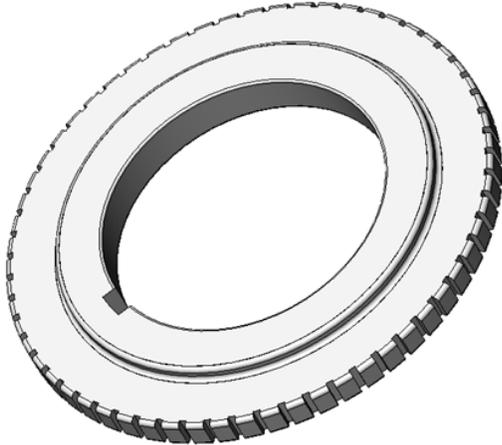
KMC sales engineers regularly work with original equipment manufacturers (OEMs) to provide engineering input and design solutions for lightweighting. If your design team is looking for out-of-the-box ways to reduce part weight or material, consider one of these best practices below.

Component Consolidation – By taking a holistic view of an assembly of parts, it's possible to combine critical features into a single solution. Weight and cost are often reduced by eliminating the need for fasteners and welding. A redesign can reduce the combined weight of the separate parts and add strength in critical areas.

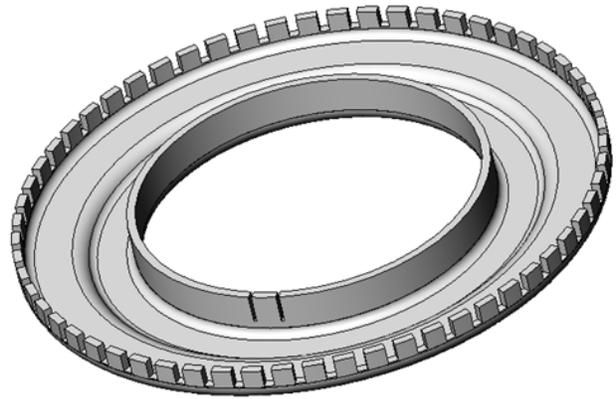
Material Thickness Reduction – Reducing the thickness of the material yields two critical benefits: weight reduction and cost savings. Design features such as gussets, strengthening ribs and flanges can be applied to compensate for a thinner gage. The KMC Sales Engineering team has successfully achieved a thickness reduction from 5 mm to 3 mm using this approach.

From Solid Steel to Stamped Metal – Redesigning a part to be stamped from sheet metal instead of machined from a solid steel block can also reduce both weight and cost. The KMC Sales Engineering team has successfully achieved a weight reduction of 45% using this approach.

Machined Rotor Sensor

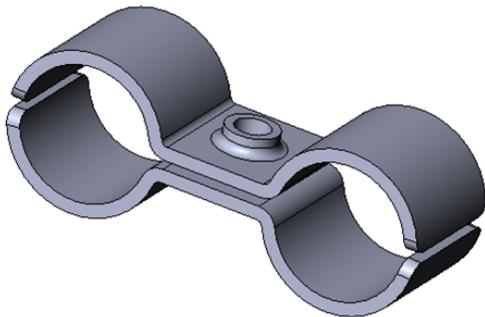


Stamped Rotor Sensor

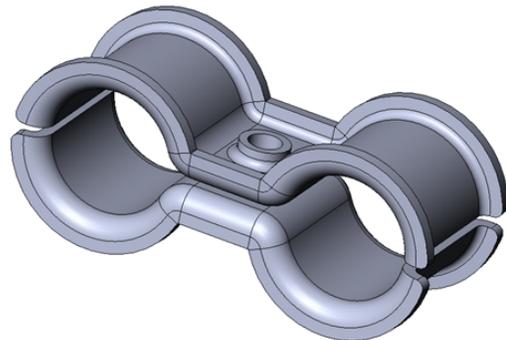


From Steel to Aluminum – Electric and hybrid vehicle manufacturers understand the value of using aluminum in place of steel for certain applications. While aluminum doesn't cost less than steel, it represents an excellent alternative when minimizing weight is a premium. The lighter the vehicle, the longer the battery life. When the strength of steel isn't required for an application, the functional purpose of the part can still be achieved.

Steel 2 Piece Clamp



Aluminum 2 Piece Clamp



Design Collaboration

Redesigning a part to reduce weight requires a comprehensive understanding of the application combined with specifications for quality and price. KMC's Collaborative Design service provides engineering input to OEMs when a part is still in the concept phase. We can review designs, answer questions, offer recommendations, and validate concepts through prototype. The end result is a reliable solution that is designed for manufacturability.

A collaborative metal forming partner can provide the expertise OEM design engineers need as they innovate for a leaner, more efficient future.