

WHEEL WEIGHT

How much do your wheels weigh? You may not think about it, but wheel weight has a pretty big impact on vehicle performance. Lighter wheels require less energy to turn and slow down, which aids in fuel consumption and reduces brake wear. Because it takes less force to control them, lighter wheels also put less strain on the suspension.

While lighter wheels can improve vehicle performance, they also have to be strong enough to support the vehicle and endure the punishment of being driven on.

Manufacturers address these demands in a variety of ways. Different material types can be used depending on the needs of the vehicle. There are also different construction methods that can provide the necessary strength and weight, while maintaining lower manufacturing costs.

WHEEL COMPOSITION AND WEIGHT

The type of material used in your wheels makes a big impact in its weight and performance. When it comes to regular street driving, the two main types of materials used are steel and aluminum.

Steel Wheels

Steel is strong and durable, and is typically easy to repair. Steel tends to be heavier than aluminum, but steel is strong and resistant to damage. Steel wheels are typically made using two-pieces, called the inner and outer, which are welded together.

Aluminum (Alloy) Wheels

One of the main benefits of aluminum wheels is their lighter overall weight. They also offer huge range of styles and designs. There are a lot of construction methods used when making aluminum wheels, but most are made using the casting process.

MANUFACTURING METHODS AND WHEEL WEIGHT

There are several methods used to construct wheels so that they are lighter and stronger. There is typically a tradeoff, however. The more sophisticated the construction process, the higher the cost.

One-Piece Cast Wheels

Casting is the process where molten aluminum is poured into a mold to create a one-piece wheel. As the metal cools and hardens, it takes the shape of the mold.

There are three types of casting methods: low-pressure/gravity casting, counter pressure molding, and high counter pressure molding. Manufacturers will choose between these methods depending on the weight, strength, finish, and total cost that the product demands.

Forged/Billet Wheels

Although the words have become synonymous, they actually have different meanings. Forging is a manufacturing process that uses billet as a building material for the forging process. The billet, a solid cube of dense aluminum, is placed in the forge where thousands of pounds of pressure are used to press or roll the billet into its fundamental form. The forged aluminum is then machined to its final finished form. The forging process allows the wheel to be built with less material, resulting in a lighter, stronger wheel with varying unique designs.

Multi-Piece Wheels

Multi-piece wheels are constructed in two or three separate pieces, using a combination of any of the processes mentioned above, and then attached via welds, rivets, or screws. This construction process allows for an almost limitless variety of wheel options. Wheels are then able to be customized by weight, strength, and size. Some wheels may even have a cast aluminum center welded into a steel barrel. A three-piece wheel may feature a forged center that is riveted or screwed to a cast or steel barrel. This process allows wheels to be customized and made as light and as strong as needed to meet the requirements of any vehicle type.