

Cast Polyurethane

For many applications, there's a viable alternative to plastic, metal and rubber—one that many OEMs aren't even aware of. It's called cast polyurethane, and it's among the most versatile, durable materials available in manufacturing.

Originally developed by Otto Bayer early in World War II, polyurethane gained traction with numerous applications in the 1950s. Today, with its comparatively low tooling costs, castable polyurethane elastomers are a perfect alternative to more common materials in a variety of applications.

But many product designers may be surprised to learn of polyurethane's physical versatility. Capable of being as flexible as a rubber band or as rigid as some metals, cast polyurethane is especially appropriate for parts that require toughness and durability, including:

- Gears
- Cogs
- Sprockets
- Solid wheels of all types

Here are some of the advantages cast polyurethane has over other materials in low-volume applications.

Vs. Plastic

Polyurethane can be formulated for superior load-bearing capability, abrasion resistance and impact absorption.

In addition, unlike plastic, cast polyurethane doesn't require high-pressure tooling, which allows for quicker turnarounds and lower-cost molds.

- Tooling costs 1/5 that of plastic
- Faster, more accurate prototypes
- More durable and wear resistant

Vs. Metal

One of the most overlooked characteristics of polyurethane is its ability to be formulated for high rigidity, making it often a viable alternative to metal for hardware such as valves and gears.

Cast polyurethane's advanced manufacturability also eliminates the need for secondary operations such as stamping, punching and painting, which saves time and costs in production.

- Lighter weight
- Faster turnarounds and lower total costs
- Higher corrosion resistance

Vs. Rubber

Featuring the elastic capability of rubber, while measuring higher on the hardness scale, polyurethane can be a good choice for certain parts because of its:

- Better wear resistance
- Higher load-bearing capacity
- Low-pressure tooling

About the Polyurethane Manufacturers Association:

PMA is a trusted resource for the latest technology, practices and expertise about cast polyurethane—one of the most versatile, durable manufacturing materials in the world. Bringing together the best companies and the most comprehensive knowledge in the industry, PMA provides networking, research and advocacy that accelerate the success of individual members while advancing the industry as a whole. Visit www.pmahome.org for more information.