

Converting from Sheet Metal to Thermoplastics

Sheet Metal—The Go-To Material

For many years, formed sheet metal has been the material of choice for a wide range of products and applications. Since sheet metal is relatively easy to bend, form, punch, and weld, it has been a popular go-to material.

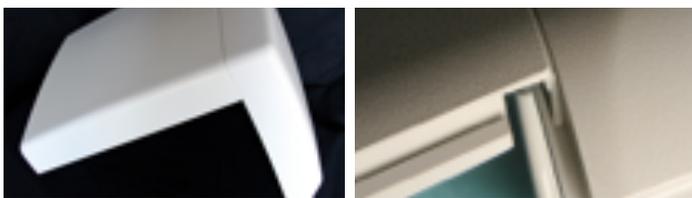
Sheet metal fabrication has inherent limitations when it comes to complex geometries. To develop complex geometries, the individual parts often require multiple forming steps and assembly of several smaller parts using fasteners or welding. These sub-assemblies may require additional machining steps to get the desired finished part. Most sheet metal parts require painting to prevent corrosion and provide the correct aesthetic look.

Thermoplastics—Proven Reliability

Thermoplastics offer manufacturers an alternative to sheet metal fabrication because they are robust, wear-resistant and will not dent or ding. Unlike metal components, which tend to corrode over time, parts made from thermoplastics retain the materials' mechanical properties and durability, which decreases replacement and out-of-service costs.

Compared to similarly sized formed metal parts, thermoplastics are lighter, reducing the weight of finished assemblies. Lighter finished assemblies can reduce fuel and energy consumption in transportation applications. These weight savings have also been shown to increase the lifespan of transportation components such as brake and propulsion systems.

The Evolution of Design



The need for lighter parts with more complex geometries and tighter tolerances has grown as designs have evolved. This improves the fit and finish when mating parts. Manufacturers are looking to suppliers to deliver finished sub-assemblies that easily snap into place or require

minimal assembly time. Suppliers who can deliver these finished sub-assemblies will find receptive customers.

Thermoplastic materials have continued to evolve to meet the needs of designers for improved aesthetics, and provide options to meet regulatory requirements. The increased regulatory requirements have led to the development of thermoplastic materials that meet smoke, fire, and toxicity regulations.

Thermoplastics Provide Enhanced Design Options



Today's thermoplastics come in a wide range of standard colours and finishes, and can be matched to nearly any colour. Since the colour is integral to the part, there is no need for secondary finishing and painting, and scratches are virtually unnoticeable. New processes allow designers to develop integrated patterns and textures to enhance the look and feel of the finished part.

Thermoplastics are recyclable and contain no VOCs, making them an environmentally sound solution that supports end-of-life recyclability and life-cycle design. The thermoforming manufacturing processes do not outgas VOCs or create any hazardous waste to dispose of.

Superior Durability and Advanced Capabilities from Thermoplastics



To produce a finished part, thermoplastics are pressure or vacuum formed over a mold. This process allows the formed part to be produced with complex geometries,

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Thermoplastics vs. Sheet Metal

undercuts, and different surface finishes. Fasteners and hardware can be integrated into the part during forming, or attached after forming using an adhesive depending on the specific design requirements. Integrating hardware in the finished part can eliminate secondary operations, reducing assembly time and benefiting from the lighter weight and design freedom that thermoplastics offer.

Benefits of thermoformed components:

- Superior aesthetics with a greater choice of colours, textures, and finishes
- Ability to form complex geometries
- Integration of functions into one piece
- No finishing or painting
- VOC-free and recyclable

Most thermoformed parts are made on a single tool, providing high-quality parts with tight tolerances. This tolerance control provides an enhanced fit and finish of the final part or assembly.

When to Consider Thermoplastics

Reimagine designs using thermoplastics to replace heavier sheet metal components and improve the overall aesthetics of the finished design. Thermoplastic materials are impact-resistant, provide excellent resistance to graffiti, chemicals and staining, and can be cleaned without worry of discoloration. Thermoplastics exceed many regulatory compliance and safety standards, making them ideal for many applications, including:

- Production runs ranging from 10 to 1,500 units
- Short component part lead time
- Larger parts that generally require assembly
- The need for improved durability and weatherability
- Improved design aesthetic qualities

SEKISUI KYDEX

SEKISUI KYDEX offers a range of thermoplastic materials manufactured in nearly any colour to match your design and application. Our designLab® and FSTLab™ are available to help you enhance your designs, ensuring they meet regulatory compliance and safety standards.

For more information on how to convert your design to thermoplastics using our appLab™, or to learn more about SEKISUI KYDEX and our line of KYDEX® and ALLEN® Thermoplastics, contact your local representative or visit us at www.kydex.com.