Product Development Solutions

Why Choose Cast Urethane Molding?

Cast Urethane Process

The process of cast urethane molding has been around for years. It serves many purposes such as: rapid prototyping, a bridge for injection molding or actual low volume molding options where injection molding tooling is cost prohibitive.

Cast urethane parts are strong and have similar properties to that of thermo plastics and have the look and feel of an injection molded part. Urethane material options include both rigid and flexible durometers. Cast urethane parts capture remarkable detail due to flexibility of silicone tooling.

Cast urethane tooling has a limited life but generally yields from 1 to 25 parts. Tools can then be refurbished at a cost less than the original tool. Multiple molds can be utilized where volumes and speed are needed.

Typical lead-time from the time of order to finished part is 1 – 3 weeks depending on requirements.

Options To Consider

With Cast urethane options such as materials, color, texture, inserts and over-molding are many.

Materials

There are over 40 urethane resins to choose from when designing your part. Most meet the demands of defense, aerospace, medical and consumer customers. Resin selections range from 10 shore A to 85 shore D. Other available properties are FDA, UL-94VO and fire rated.

Color

Parts can be painted to your exact specifications and matched to a pantone number or chip. Molded in color is also option.

Texture

Part will pick up the texture of the mold. However, different textures can be added to greatly enhance the appearance. Light Matte and Matte are two very popular textures.

Inserts

Inserts can be molded directly into cast urethane parts. Pins, wires or electronics can also be molded directly into parts.

3 StepProcess

1. Create master pattern – This step involves making a master pattern for your CAD file. The part is generally made from an SLA or CNC machining center. The pattern if then finished to customer specifications such as inserts or surface finish.
2. Make the mold – The master pattern is then suspended in a frame and silicone is poured around it. Once set, the pattern is removed and mold is ready for making parts.
3. Urethane casting parts – Once the urethane material is chosen will then be injected into mold. After the urethane is hardened part is removed.
4. Final finishing – After part is molded then it's time for final clean-up and painting. It's then ready for shipment.

Basic Design Tips

Wall thickness – minimum wall thickness for parts should be no less than .050" with maximum being .187' thick. Of course, these are not hard rules and variations are acceptable. Uniform wall thickness is preferred but variations can be processed without impacting part results.

Drafts – This where the process becomes very flexible and engineering friendly. Unlike injection molded parts, the cast urethane process does not require draft and therefore saving valuable design time.

Undercuts – This is not a concern and can be accommodated for within the cast urethane tooling.

Ribs – general rule of thumb is ribs should not exceed 60% of the nominal thickness. This will help prevent sink effects in the part.

Bosses – These can easily be molded in to accommodate molding in fasteners or inserts.

Other Considerations

EMI/RFI shielding – Enclosures designed to house electrical components may require EMI or RFI shielding. PDS offers both processes utilizing copper shielding methods.

Cast Urethane Benefits

1. Low tooling investment
2. Design Freedom
3. Ease of design change
4. Lower Risk
5. Fast to market

Conclusion

The cast urethane process is an inexpensive and accurate way to make parts. The process accommodates short lead times and is a fast way to make prototypes to low volume production parts. In addition, it's an excellent alternative to steel tooling when time or money does not allow and can be practical bridge tooling while production tools are in process.