

SEPTEMBER 2021

BAMBERGER POLYMERS TECH TIPS

Living Hinge

Living hinges provide 1) ability to connect two sides and 2) allow rotational movement. Perhaps the biggest benefit is, when compared to a traditional hinge, the reduction in cost by reducing number of parts required and eliminating assembly.

While injection molding is most often considered for living hinges, other processes such as blow molding, extrusion, and stamping can also be used.

In general, PP is the most popular resin for a living hinge. PE can be used in some situations. If you need to use an engineering grade plastic such as PC or ABS then a traditional hinge may be a better fit. Molded parts with living hinges frequently require higher flows to ensure a rapid mold fill and good hinge quality. However, too high a melt flow reduces the flex life of the hinge.

Living Hinge Types

Common types of living hinges are:

- Bi-stable Hinge
- Butterfly hinge ('flipping' action)
- Double Hinge (when 360° rotation needed) Flat hinge (most common)

To properly design a living hinge, it is important to determine how the physical properties relate to the hinge design calculations. The expected end use is of utmost importance. A living hinge may be required to withstand:

- Several thousand cycles (fully elastic)
- A few cycles (fully plastic)
- Flexing hundreds of times (elastic/plastic combination)

Hinge thickness can adversely affect the strength and performance. Gate location should ensure the melt flows perpendicularly to the hinge.

As is typically the case, end-use testing/performance are critical components of the design process.

