Application
Note

Overview

A living hinge is a thin flexible hinge (flexure bearing) made from plastic, as opposed to cloth, leather, or some other substance, that joins two rigid plastic parts. The hinge allows the plastic parts to bend along the line of the hinge. It is typically manufactured in an injection molding process that creates all three parts at one time as a single entity. A thinned section of the plastic part bends to allow movement. The hinge's minimal friction and little wear make it useful in the design of micro electromechanical systems. If correctly designed and constructed, living hinges remain functional throughout a product's lifetime as these hinges can flex more than a million cycles without failure. Polyethylene and polypropylene are considered to be the best resins for living hinges due to their excellent fatigue resistance. The low cost and ease of manufacturing makes them quite common in disposable packaging.

Why Connex?

Connex printing systems can print parts with living hinges easily and quickly. This is possible thanks to the excellent elongation-to-break properties and very good tear resistance of Digital Materials™. These two traits allow for the generation of living hinges that withstand repeated bending and flexing.

Living hinges with Connex-driven parts can be used for:

- o   Caps and packaging
- o   Clips
- o   Left and right clamp shells

Pictured are common examples of living hinges

Tips and Tricks

When working on you CAD design, assign a specified shell to each element in your design. When converting that file to an STL (see "CAD to STL" on the Objet website for further information) convert the file while defining each STL as a part of your assembly. This will allow you to then clearly define the area related to the

living hinge. This also enables the selection of elastomeric-like materials for other areas. All this is done as part of the preparation of your printed model using the Objet Studio™ software.

You can also use the Objet Coating function for texturing features. This feature allows you to define areas on the model surface where a coating layer is applied. The coating can vary from 0.3mm – 3mm and extracts the existing material so there is no effect on the tolerance.

Pictured below are examples of living hinges printed using Connex PolyJet Matrix™ technology. The part was split into shells as explained above. The hinge was printed in TangoBlackPlus™ and the lid was printed in VeroWhite™. It is important to note that the products' design was not affected by the splitting; the sole difference was the definition of additional shells.

Reference

- Case study: Can be found on the Objet website under Case Studies → Over Molding
- "CAD to STL" – Can be found on the Objet website
- Case Study: Tescoma – Can be found on the Objet website under Case Studies → Consumer Goods
- Objet Studio Software – Can be found on the Objet website

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