Design for aesthetics
Design for HP MJF: Design guidelines

Introduction

To print parts with optimal appearance and material properties, there are certain specifications to bear in mind.

Stair-stepping effect

All layer-by-layer manufacturing technologies require a discretization of their Z dimensions according to the layer thickness. The visibility of these layers depends mainly on their thicknesses and printing angles.

HP Multi Jet Fusion (MJF) technology uses layers of only 80 µm (0.080 mm), which are difficult to see with the naked eye in most situations. However, for small angles in the part, layered steps could become visible.

Thus, when designing parts with protruding features, it is recommended to keep angles above 20° between big, flat areas and the XY plane if they will be facing upward. Surfaces that face downward are typically exempt from stepping as long as they are oriented and avoid angles less than 5° to 10°.

These values, however, are general indications and ultimately depend on the application. For optimum results, the best solution is to try several options and choose the one that yields the better look and feel.

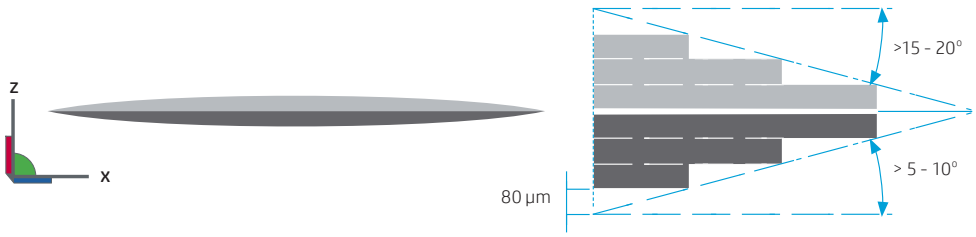

Figure 1: Stair-stepping effect

Designing for aesthetics guidelines

- When possible, place small features with critical dimensions—such as pins, holes, and raised texts—in the same plane, taking into account that areas printed facing downward would have a better look and feel than those that face upward.
- Design parts with a smooth cross-section transition.
- When possible, add internal lattices or hollow the parts to achieve a lighter design.
- Avoid long, thin, flat parts with an aspect ratio—length vs. width—higher than 10:1.
- Avoid designing parts with a predominantly long and thin curved segment.
- Avoid ridges and ribs on large, flat areas.

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