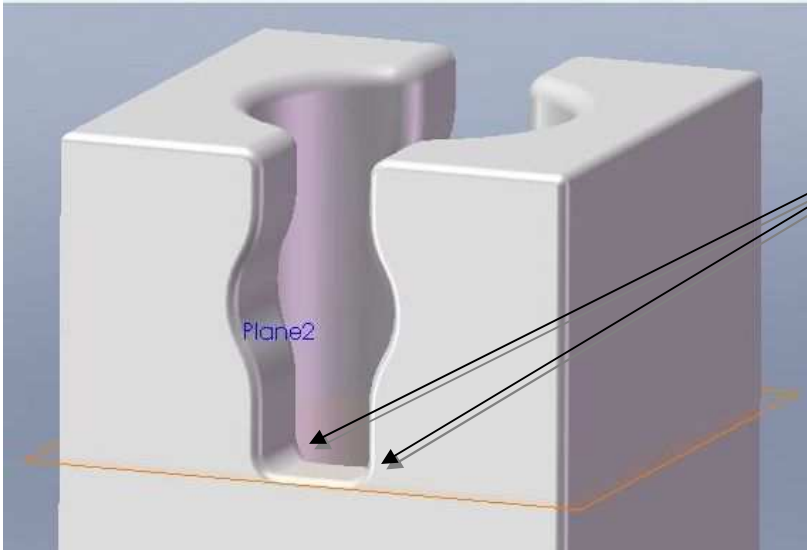


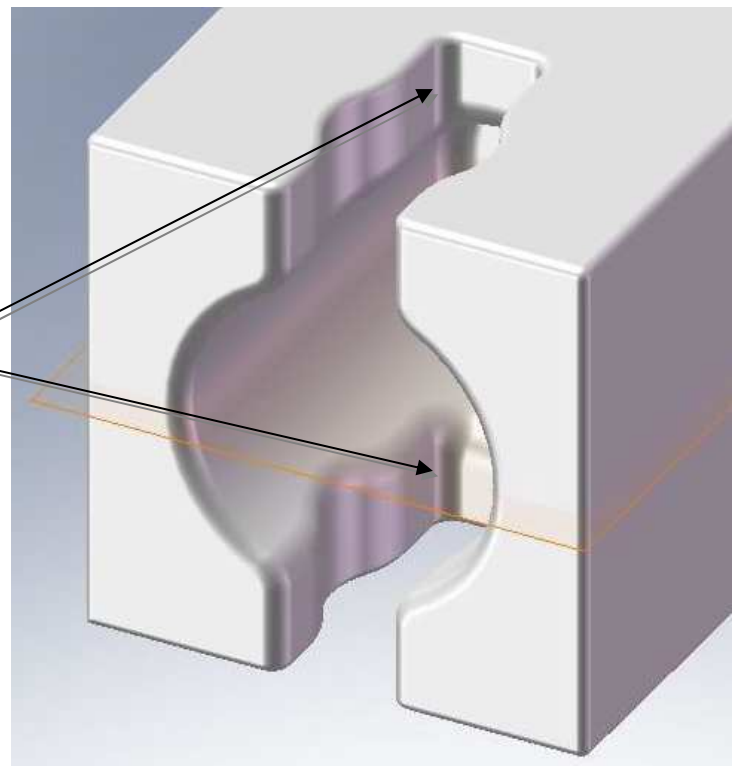
3D Printer Advanced Topics: Part Orientations (Strength Considerations)

The 3D printer lays down material in layers. Within a layer, the strength is comparable to that of ABS plastic. However, the strength between layers is significantly less, since the layers do not bond together as well. A stress concentration that crosses layer transition will likely cause problems.



These stress concentrations cross a layer transition (layer orientation is represented by the plane). The top two flanges will break off at this transition if any forces are applied in the slot.

These stress concentrations do not cross any layer transitions (layer orientation is represented by the plane). The strength of the flanges against forces in the slot will be much greater in this orientation than in the previous example.



If strength is not a concern, consider instead where support material will be placed. Choose an orientation that will put support material around external features instead of internal features such as holes or slots. Not only is the support material much more difficult to remove on internal features, but often the attempt to remove it can cause the part to split apart at a layer transition surrounding the internal feature.