

DESIGN GUIDELINES FOR MOUSER'S ISS DESIGN CHALLENGE

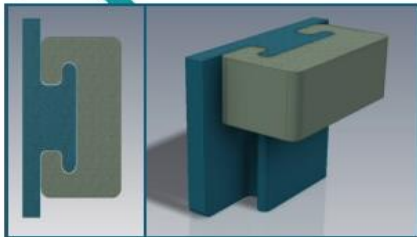
The goal of Mouser's ISS Design Challenge is to create an item that can be 3D printed in space that will be useful to the astronauts on the International Space Station. This design will combine both mechanical design and electrical design disciplines within a single item. The design can be useful tool, a research item, even an item for entertainment... whatever you can think up for the astronauts! However, since the entry will need to be a part of the ISS environment, many design guidelines will apply.

The 3D printed portion

The ISS is now equipped with an additive manufacturing facility or, in other words, a gravity independent 3D plastic printer created by Made In Space, Inc. As with all 3D printers there are limits to size and material that can be used. The Design cannot exceed a build volume of 14cm x 10cm x 10cm with a nominal XY direction resolution of 0.15mm and nominal Z direction resolution of 75 micron layer height. The usable materials include ABS, HDPE, and PEI+PC polymers. All models should have a minimum of 1mm wall thickness. There should also be a minimum of 1mm spacing between individual parts to be printed. Additionally, the model cannot have any support structures. Snap-fit (non-moving) guidelines are 0.2mm on each side and slip-fit (moving) guidelines are 0.5mm on each side. These are illustrated as such:

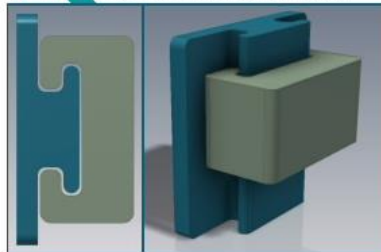
SNAP-FIT

A part that is designed to fit into another part and does not move. Snap fit guidelines are: 0.2mm on every side. (0.4mm diameter difference if an axle)



SLIP-FIT

A part that is designed to rotate or slide within another part. Slip fit guidelines are: 0.5mm on every side. (1 mm diameter difference if an axle)



The Design entry can be made via graphic file of a hand drawn image (.jpg) or a mechanical CAD file.

Electrical Design

The Design should not require external power from the ISS and can be powered from either alkaline batteries or a coin cell battery (CR2032). Use of switching regulators is discouraged due to potential RF interference.

The Design should not need require external wireless communication. There should be no need to access the WiFi network aboard the ISS in order to operate the device. In fact, it is recommended that the Design not contain any intentional radiators at all that could potentially interfere with ISS operations.

Safety

Safety is of the upmost concern with any item aboard the ISS. This includes the safety of the vessel and it's operation as well as the well-being of the astronauts. All items delivered to and printed aboard the ISS will be under heavy scrutiny from a safety perspective.

Under no circumstances should there be an open flame or spark as part of the design nor should there be excessive heating of wires or circuits due to high current conditions.

Items aboard the ISS should not have sharp corners or points that can possibly puncture a suit or station wall. All objects must have round edges and blunted tips.

Submit entries online at <http://www.mouser.com/contests/iss-project-contest>