Subject: "Best Practice" guide for standard mechanical problems?
Posted by hagman on Thu, 22 Nov 2012 18:25:34 GMT
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I wonder if anyone has assembled something like a "Best Practice Guide" for standard mechanical constructs such as suitable dimensions for gears, levers, joints or other movable parts printed in-place.
For example, with a required clearance of 0.5 mm or whatever the material dictates, we have for two gears that each has a backlash of 0.5mm with respect to their axes, hence they might move 1mm apart, hence their teeth must overlap (in base position) by significantly more than 1mm and of course also the teeth must be printed with a clearance of 0.5 mm and so on, constraint adding to constraint. Together already these few remark enforce teeth of at least 2mm. To be safe, probably the minimum gear size would be almost round about 1cm, and of course possibly much more if you want to have some leverage. Maybe someone has already thought deeper about and experimented with this and found ways to improve accuracy beyond what is actually possible and would like to share their thoughts. (For example I found tricks mentioned in the forum with little hills added to some sirfaces to ensure stricter guiding of rotating parts than what clearance seems to allow).
Similar problems may exist (and have been solved?) for other constructs, e.g. for minimum size ball-and-socket joints to allow big enough escape holes while still giving a stable structure.
Thanks in advance for any shared ideas

Subject: Re: "Best Practice" guide for standard mechanical problems?
Posted by Fredd on Thu, 22 Nov 2012 21:54:00 GMT
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There are a couple mini tuts on this subject in the tutorial section at SW. Here is 1 link
http://www.shapeways.com/tutorials/designing_mechanical_part s_for_3d_printing

Subject: Re: "Best Practice" guide for standard mechanical problems?
Posted by hagman on Sun, 25 Nov 2012 22:32:52 GMT
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Thanks for the links. These tutorials more or less repeat "obey the design rules for clearance and wall thickness" over and over. What I was rather looking for: Tipps how to cope with design rules at extremes of mechanical design. For example, below what size should one prefereably use two layers of offset gears to make the mechanic run smoothly? Or below what sizes will the restrictions and possibly inaccuracy make gears just fall apart due to backlash, flexibility, material weakness? Is it wise to add more clearence to the teeth only that happen to touch in the

production situation? Maybe someonehas comeup with design ideas where mechanical parts are printed enclosed (not removale without destruction) but not in their final position and they rather "snap in" on first move ... That kind of information was what I meant.