Subject: gear question
Posted by LatexSpikes on Tue, 11 May 2010 13:46:41 GMT
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Ok, new guy here. I've been playing with ray tracing programs for years, but I'm new to CAD. I know it's not a major step up, but it's big enough that I'm stumbling. I'm familiar with POV-Ray (www.povray.org) and recently downloaded a demo version of Rhino, so I'm limited to 25 saves and no copying. So far I'm up to one model. I like POV, but it's designed to give image outputs, not meshes.
Anyway, my question is this: how much gap should there be between objects (like teeth on meshing gears) for a model to print properly? I'm trying to make something along the lines of this:

Fisnished it should be about 1 inch in height. The image only shows the gears themselves; the shafts and end caps aren't shown. Any help or suggestions with the gear question, Rhino, or a better CAD program would be appreciated.

Subject: Re: gear question
Posted by jsp7707 on Tue, 11 May 2010 14:06:13 GMT
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Nice Design.

I would round off the edges of the teeth some. Here is a photo of a design I'm working on with gears. Same principal you are looking at.

I am using Solidworks 2001. I have access to this at college. Too expensive otherwise.

Anyway, my space between gears is about .03". Total size to be 4".

I'm still ironing out some problems exporting out of this program in a format suitable for this site.

File Attachments

1) 4577042921_eafc3e923f.jpg, downloaded 381 times

Subject: Re: gear question
Posted by Youknowwho4eva on Tue, 11 May 2010 14:53:49 GMT
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The spacing depends on the material. Go to support/materials, and read through, it should give you an idea. Also look through the "It Arrived" section to see how others tests have come out. As for the Solid works issue, I can import SW files if you want to send me the file, I can export it to STL for you.

Subject: Re: gear question
Posted by artur83 on Tue, 11 May 2010 16:31:32 GMT
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Solidworks should have no problems exporting in STL.
In fact it's one of the easiest export options.
Just make sure you're under the 500K triangles count. (which may be tricky with all that detail.
Don't hesitate to ask for help if you encounter problems.

Subject: Re: gear question
Posted by jsp7707 on Tue, 11 May 2010 18:48:49 GMT
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Actually a single part exported from solidworks is fine.

I have an assembly I'm trying to export as 1 part/stl file but the surfaces that are mated and points of overlap are giving me a problems.

See my post and attachments...

link

Subject: Re: gear question
Posted by virtox on Tue, 11 May 2010 20:02:29 GMT
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Haha, another popular concept, I'm working on something similar

As to the clearances (<- term mostly in the forum)
This also depends on whether it is to be printed as a working piece in one go, or separate pieces clicked together.

My experiences/current working guidelines :

Assuming the Strong & Flexible material, clearances for "moving parts" models (<- see tutorials on this) should be around 0.6 mm, but trial and error is part of the process

If it is to be clicked together after printing you can go at least as low as 0.2 mm. (crudely said : pegs can turn out 0.1 mm larger, holes 0.1mm smaller) But.. trial and error is also the answer here..

Luckily, the Strong an Flexible materials have a tendency to "wear in", usually resulting in smoother movement after a while.

Also keep in mind that larger surface areas need larger gaps.

Good luck !

Oh and POV-Ray rules ! But indeed, it is not suited for meshes.
(It can render them nicely though !)

Stijn

Subject: Re: gear question
Posted by LatexSpikes on Fri, 14 May 2010 13:02:24 GMT
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POV does, in fact, rule. I've been using it since the days of MS-DOS.
The final model will only be about 2.5 -3 cm tall, so snap together is definitely the way to go.
Think I finally got the gear design working, although I'm sure there was an easier way than what I did.I lofted one tooth, deleted the surface mesh of the gear face then used the loft created surfaces to make one tooth. copy-paste-rotate a few times and I had solids of all the teeth then booleaned them all to the truncated cone.

I really need to find an online tutorial for Rhino.

edit: Odd thing happened when booleaning: one tooth won't union with the rest of the gear. I undid (undo'ed?) the union of one of the other teeth and used it to replace the 'broken" tooth, but still won't work. Any ideas?