

2 - 3D printing and gearing

February 28, 2021 3:47 PM

Sun. Feb 28, 3:45-8:00, 30 min total in breaks

3D Printing Constraints:

- 300x300x300 mm max print size
- PFT type filament
- min thickness 0.4 mm, realistic min thickness 1 mm

<http://3dprintingfromscratch.com/common/3d-printer-filament-types-overview/>

- ABS & PLA common PFT type filaments
 - PLA is more environmentally friendly
 - biodegradable thermoplastic

<https://www.creativemechanisms.com/blog/learn-about-poly-lactic-acid-pla-prototypes>

- article about PLA
 - biodegradable
 - not great for high-temp applications → shouldn't matter to us
 - easily recyclable ☺
 - disadvantages:
 - could start softening/deforming between 111-145°F (~44-63°C)
 - shouldn't be a problem for use in standard Canadian household

- properties:

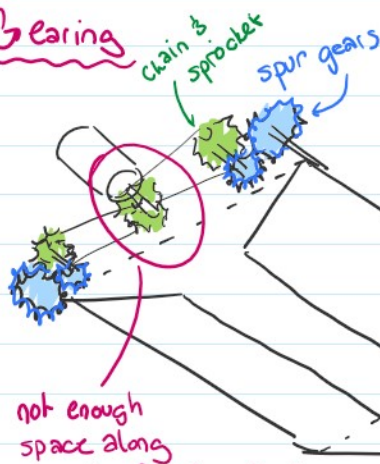
Tensile Strength: 61-66 MPa (8840-9500 PSI)

Flexural Strength: 48-110 MPa (6950-16000 PSI)

→ more properties can be found at: <https://plastics.ulprospector.com/generics/34/c/t/poly-lactic-acid-pla-properties-processing>

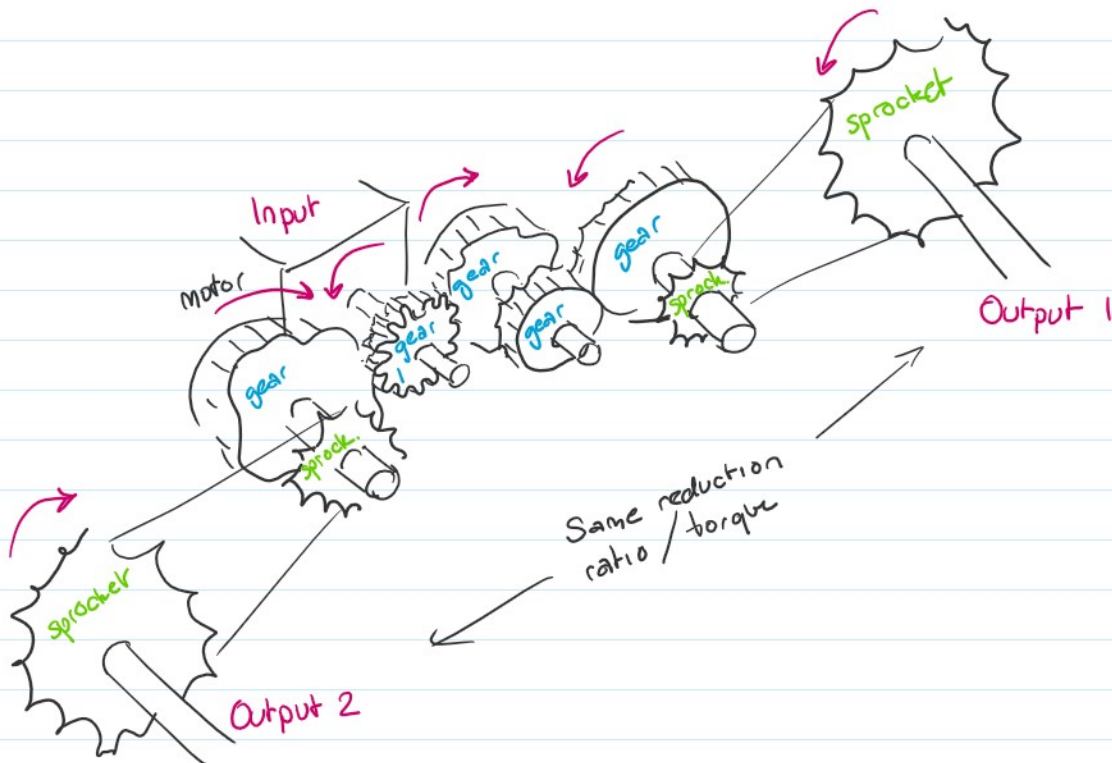
→ eg. density 1.22 - 1.30 g/cm³ (ASTM D792)

Gearing



* 1 side will need 1 more gear to switch rotation direction

not enough
space along
length of motor shaft
for 2 gears or sprockets



Gear 1:

<https://us.misumi-ec.com/vona2/detail/110300428250/?CategorySpec=unitType%3a%3a1%0900000045589%3a%3ab%0900000029845%3a%3a5&CAD=01&curSearch=%7b%22field%22%3a%22%40search%22%2c%22seriesCode%22%3a%22110300428250%22%2c%22innerCode%22%3a%22%22%2c%22sort%22%3a%22%2c%22specSortFlag%22%3a%22%2c%22allSpecFlag%22%3a%22%2c%22page%22%3a%22%2c%22pageSize%22%3a%2260%22%2c%2200000045589%22%3a%22b%22%2c%2200000029845%22%3a%22mig00000001447982%22%2c%22cadType%22%3a%22%22%2c%22fixedInfo%22%3a%22MDM000008670061103004282501240873434-3096684450105902630%7c9380%22%7d&Tab=codeList>

Configured Specifications

Number of Teeth	20	Material	[Steel] 1045 Carbon Steel or Equivalent
Shape	Shape B	Heat Treatment	Not Provided
Surface Treatment	Black Oxide Coating	Ground Tooth	Not Provided
Backlash	Provided	Shaft Bore Dia.(Ø)	5
Bearing	Not Provided	Tooth Width B(mm)	3
Shaft Bore Tolerance	H7	Module/Diametrical Pitch	0.5
Precision((Grade) *New JIS)	JIS B 1702 (Class 2)	Hole Shape	Round Hole + Tap
RoHS	10	-	-

Show Less

Price \$14.77

Total \$14.77

Ship Date Fri. Mar 05, 2021
Valid until 8PM, EST

Qty. 1 Add to Cart

Quantity ?	Price	Ship Date
1-4	\$14.77	Mar 05, 2021
5-9	\$14.04	Mar 05, 2021
10-14	\$9.16	Mar 05, 2021
15-29	\$7.85	Mar 05, 2021
30-300	\$7.39	Mar 18, 2021 to Apr 08, 2021
301-	\$7.39	TBD

NOTE: Ship Dates above are subject to change depending upon availability.

- Look into 3D printing gear
 - o Could look into different filaments for better material properties
 - o Much cheaper!
- GT2 (G2T?) Timing belts

LIST OF CONCERNS :

- gonna blow through mech budget
- mech support? → Colin
- size constraint → officially update somewhere?