

Project: 3D Printing and Testing

Date: Fall '21 - Spring '22

Names:
 Kathryn Nelson
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Stiffness/ E (kPa)
 Thickness (mm)
 Compressive Modules (kPa)
 Frequency (rad/s)
 Poisson's ratio (unitless)
 Compliance (cm^3/mmHg)
 Angular Acceleration (rad/s)
 Radial Force (N/mm)
 Layering (um)
 Pressure (mmHg)

+												
-	+											
+	+	+										
-	-	+	-	-	-	-	-	-	-	-	-	-
+	+	-	-	-	-	-	-	-	-	-	-	-
-	+	-	-	-	+	+	-	-	+	-	-	-
-	+	+	+	+	+	+	+	+	+	+	+	+
+	+	+	+	+	+	+	+	+	+	+	+	+
-	+	-	-	-	-	-	+	-	-	-	+	+

Direction of Improvement	
Maximize	▲
Target	□
Minimize	▼

Relationships	Weight
Strong	● 9
Medium	○ 3
Weak	▽ 1

Correlations	
Positive	+
Negative	-
No Correlation	

Customer Competitive Assessment	
1	Poor
3	Acceptable
5	Excellent

Engineering Requirements													Benchmark Assessment				
Direction of Improvement																	
Relative Weight	Customer Importance	Customer Requirements	Stiffness/ E (kPa)	Thickness (mm)	Compressive Modules (kPa)	Frequency (rad/s)	Poisson's ratio (unitless)	Compliance (cm^3/mmHg)	Angular Acceleration (rad/s)	Radial Force (N/mm)	Layering (um)	Pressure (mmHg)	BDL	Biomotics	Stratasys	Axial3D	
3%	1	Size	●	●	▽	○	○	●	▽	▽	○	▽	5	3	5	3	
8%	3	Easy to connect	▽	●	▽	▽	▽	▽	▽	▽	○	▽	5	3	3	5	
25%	9	Soft Exterior, Hard Interior (layered)	●	▽	●	▽	▽	○	○	○	●	●	3	5	1	1	
3%	1	Lightweight	●	○	○	▽	○	▽	▽	▽	○	○	3	3	3	3	
25%	9	Material selection	●	▽	●	●	○	●	●	●	●	●	5	3	5	3	
8%	3	Retains shape	○	○	▽	●	●	○	○	▽	●	○	3	3	3	5	
25%	9	Similar properties to organic tissue	●	○	●	●	●	●	○	○	●	●	5	1	3	1	
3%	1	Cost Within Budget	●	●	○	▽	○	○	▽	○	▽	○	5	3	1	5	
Importance Rating Sum (Importance x Relationship)			785.3333333	285.3333333	711.7777778	572.4444444	434	595.1111111	416.8888889	406.22222	794.667	728.44					
Relative Weight			14%	5%	12%	10%	8%	10%	7%	7%	14%	13%					
Technical Requirement Units			kPa	mm	kPa	rads/s		cm^3/mmHg	rads/s	N/mm	um	mmHg					