

MATERIAL OVERVIEW

Urethane Casting is most commonly used during the prototyping process, and can generally be expected to hold +/- .010" tolerances with +/-0.0015 in/in (parts larger than 20" may result in tolerances even beyond those stated). For parts with tight tolerance requirements, FATHOM generally recommends CNC machining or injection molding. Regarding soft parts, there is a Shore A tolerance of +/-10. Every application is different, though, so please speak directly with a FATHOM expert.

CONSIDERATIONS	
Soft Tool Casting	Requires a master pattern and a silicone tool be made.
Master Patterns	Usually CNC machined master patterns that last up to one year for most geometries, though masters can break during the making of the silicone tool. 3D printed (e.g. PolyJet or SLA) masters have a shorter shelf life. Masters are destroyed after their useful life.
3D Printed Tools	Tools are good for up to 20 parts for most geometries and can deliver quality parts up to 90 days from being made—tools are destroyed after their useful life.
Overmold	Complex parts such as overmolds can be achieved, however casting process does not result in a very strong chemical bond between shots, regardless of material selection. Parts should be designed to maximize mechanical bonding between shots.
Color	Parts can be casted in color and will approximately match specified Pantone color, however, paint is recommended for show models (greater cosmetic result) and parts that require exact Pantone color matching.

STANDARD MATERIALS	SHORE VALUE	COLOR OPTIONS	NOTES	RECOMMENDED PRODUCTION METHOD AFTER PROTOTYPING
RIGID MATERIALS				
ABS-Like	85 D	Can Be Colored For Near Match To Pantone	Common Material Choice	Injection Molding
UL94V0 Rated	74 D		UL94V0 Rated Material Meets Specified Flammability Standard	
Polypropylene-Like	80 D		—	
High Temp	80 D	Light Tints Are Very Difficult As Resin Is Naturally An Off White	Glass Transition (Tg) At Over 120°C	
Clear High Temp	87 D	Clear Only	Requires A High Polish To Achieve Water Clear Finish, Glass Transition (Tg) At 110°C	
SOFT MATERIALS				
Silicone	20A-50A	Can Be Colored For Near Match To Pantone	Cannot Paint, Food Grade	Compression Molding Or Liquid Silicone Injection Molding
Rubber-Like	20-90 A		Cannot Paint	Injection Molding, Compression Molding, Or Liquid Silicone Injection Molding
Clear Rubber-Like	30-80 A	Clear, Can Be Tinted To Achieve Transparency	Clear, Cannot Be Painted	

Need A Material Not Listed?

Please Speak With A FATHOM Expert Directly About Additional Material Options.

Additional Notes // If color matching needs to be exact, FATHOM often recommends doing a first article (which will extend the timeline). If a color or assembly match needs to be made for other parts, a sample part is recommended to confirm color match. Parts can be molded in glossy, or matte finish—please always specify. If Shore A needs to be exact, FATHOM recommends a first article, as well as casting in a .25” thick test slug for durometer measurement. This may add to the timeline. Discuss with your FATHOM expert.