

The Rice Remedy

Using Rice Husks as an Alternative to Plastic Prescription Bottles

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Problem Statement:

- Bottles not recyclable due to orange color
- 165 million prescription bottles are landfilled each year
- As the average lifespan of people increases, the demand for prescription bottles increases proportionally

Goal:

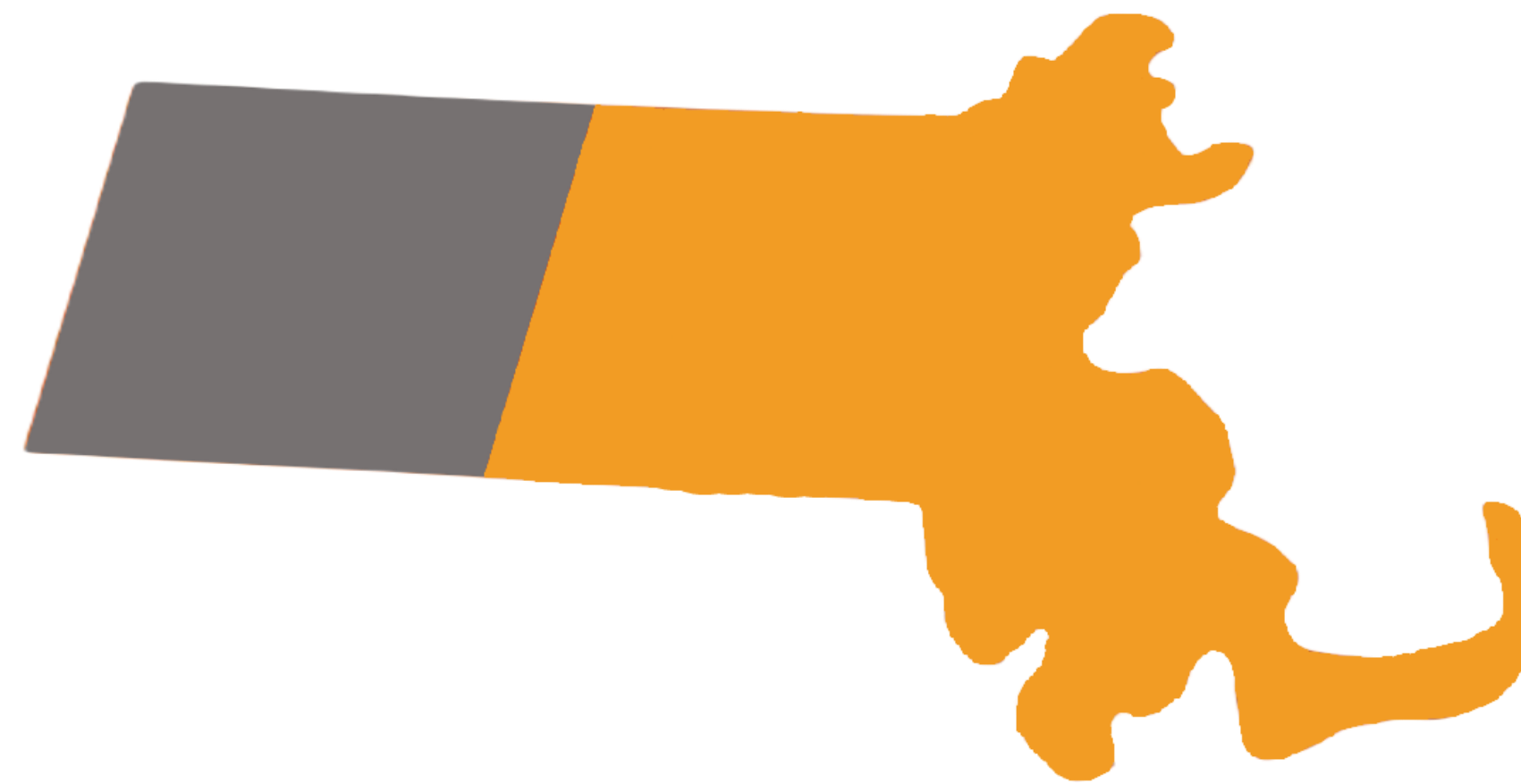
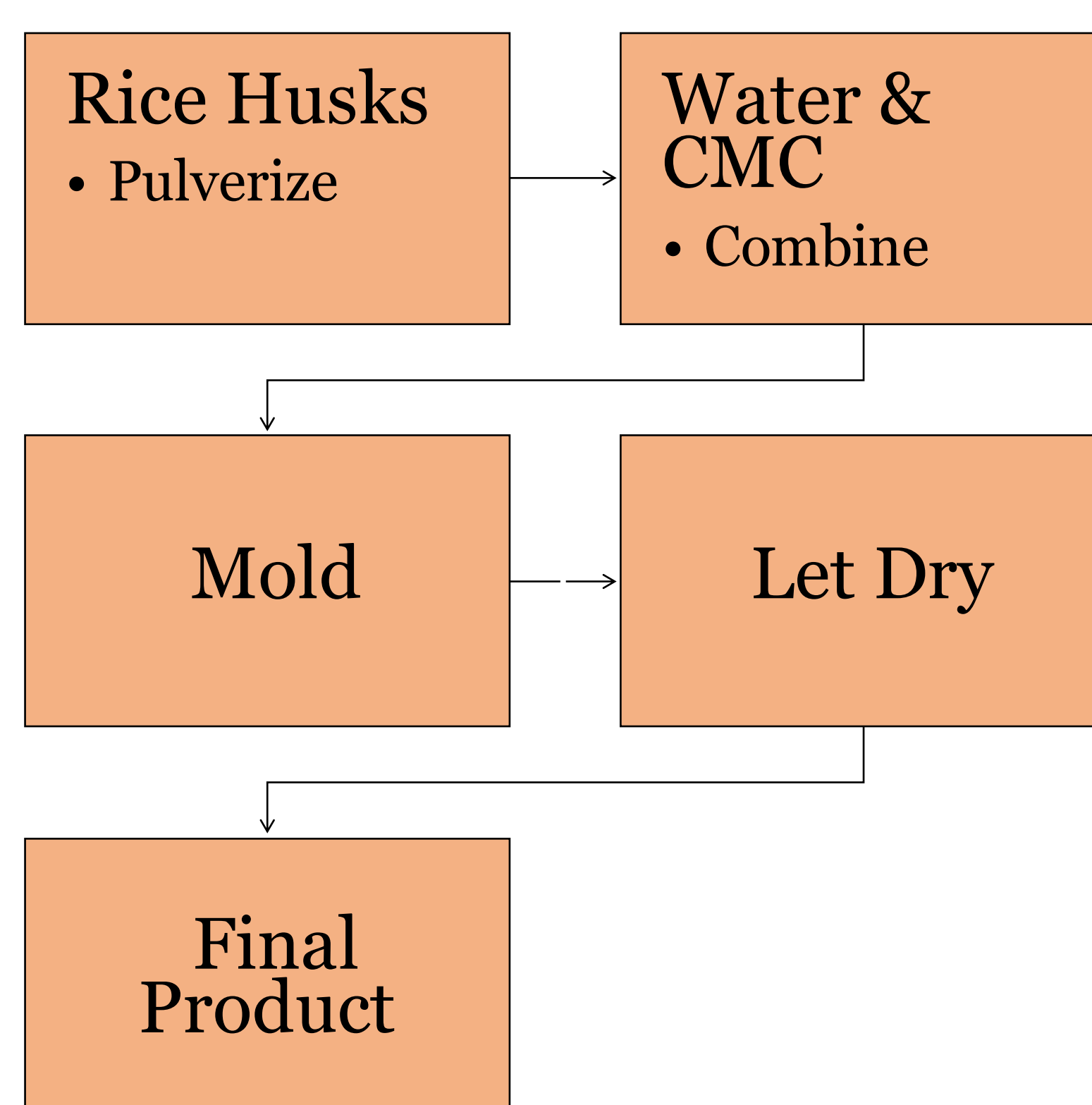
Find a biodegradable material that meets all the requirements of a pill bottle:

- UV resistant
- Non-corrosive
- High durability
- Child safe
- Cheap
- Eco-friendly

Solution: Rice Husks

- Byproduct of the rice industry
- Forms a material with similar properties to plastic
- Biodegradable
- Painted on edible glue ensures low porosity

Manufacturing Process:



Above: The surface area of all landfilled prescription bottles per year.

Below: Life cycle of prescription bottles

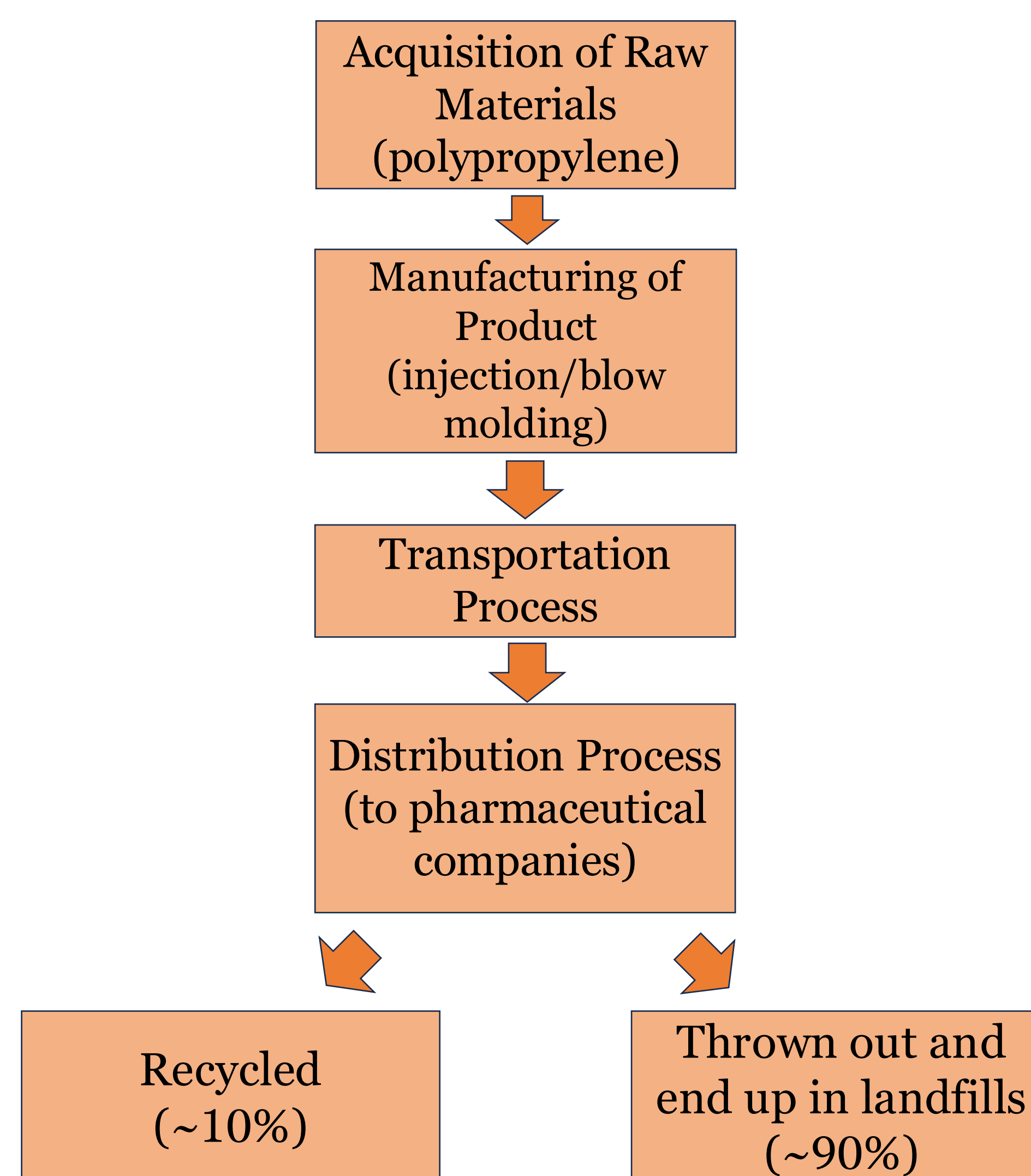


Table 1: Properties of Prescription Bottles and Rice Husk Bottles

	Prescription Bottles	Rice Husk Bottles
Material	Polypropylene	Silica, Lignin, and Cellulose with carboxymethyl cellulose (CMC) and water
UV Protection	Colored Orange	Lignin blocks UV rays
Tensile Strength	27 Megapascals (MPa)	77 Megapascals (MPa)
Burning point	215-270 C	550-700 C
Water absorption after 24 hours	<0.01%	0.1%

Our Product:



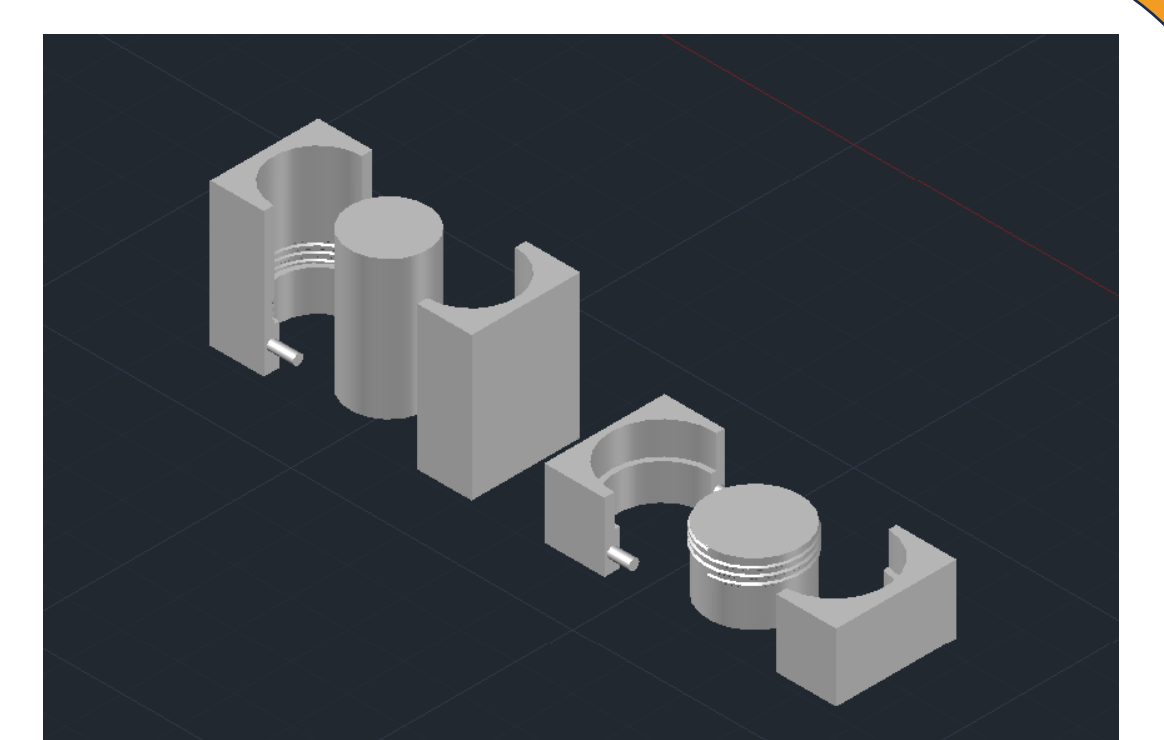
Results:

- Viable substitute for polypropylene bottles
- Other areas of the medical field could utilize this material
- Needs further testing to be put into industrial situations

Social Impacts:

- Immensely reduces plastic waste from medical industry
- Changes consumer perception of prescription bottles
- Individuals will have less plastic waste exiting the household
- Utilized throughout the medical field

CAD model of Prescription Bottle Mold



Drying final rice husk product



Works Cited

