

PirateParagon

Plastic Lumber

Plastic lumber is a promising material that has a vast number of applications, ranging from fences and deck floors to even railing. It can be usually considered as an emerging substitute for natural wood.

Composition:

Plastic lumber is mostly made from High-density Polyethylene, Polypropylene polymer, Polystyrene polymer, Polyvinyl Chloride polymer, and many other polymers, which are typically found in wasted plastic bottles, cups, and bags (Postconsumer plastics).

In some cases, Fillers can be added to the mold mixtures that makes the plastic lumber, whether it was to increase its stiffness or improve its resistance against intense heat. Such fillers are sawdust, mineral fibers, and glass fibers.

Processing:

Plastic lumber is usually manufactured via extrusion, where the plastic is mixed and homogenized (meaning that the polymers and compound are reduced in size and equally dispersed throughout the mixture). To make this mixture, The plastic is heated and melted in a machine called the Extruder. After melting, the plastic (now in the form of hot mass) is shaped using different types of molding like injection molding and compression molding. In injection molding, the plastic flows to fill some molds of different shapes and sizes. These molds are attached to a carousel, as in figure (1), which periodically rotates to allow for the molding process to happen continuously. The plastic molds are then put in cold

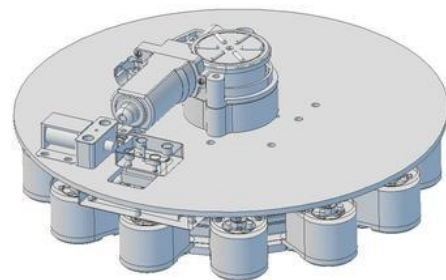


Figure 1 A Horizontally-rotating carousel whose molds are being filled

water to cool and solidify to later be utilized as a structural material.

In compression molding, the plastic flows into a mold cavity and is compressed by a top plug, as in figure (2).

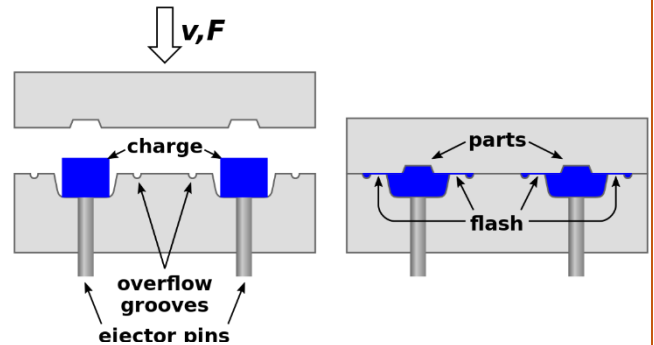


Figure 2 A top plug is compressing the plastic in compression molding.

Advantages of using Plastic Lumber:

- 1- It can effectively stop deforestation and reduce the amount of plastic wastes.
- 2- It doesn't fracture like wood, so it would require far less maintenance.
- 3- It opens the door for many different applications with the aid of fillers, which can manipulate its properties to better suit the surrounding environment.