

ABSTRACT

Plastic is a commercial material that is often found in daily life by the public. The lightweight, strong, and cheap character of plastic makes plastic growth increase every year, making it a very serious problem for the environment. Separation of plastic waste needs to be done, and separated by type for recycle purposes. Polypropylene is a material that can be recycled. Recycle material has a slightly different character from virgin material. Processed recycle material has a different character, therefore the product has a defect. The research is to achieve product optimization to minimize defects, namely sink mark and shrinkage defects.

The parameter determination process is carried out to improve the quality of products that do not have defects so that the goods can be used. The parameters used are the temperature of 180 °C, 190 °C, 200 °C, cooling time of 13 s, 23 s, 33 s, injection hydraulic pressure 125 bar, 130 bar, 135 bar. The method used in this research is the Taguchi method. This method will obtain the optimum parameters and levels for achieving minimum shrinkage and sink marks.

The results obtained are the optimum parameters and levels, the defects in longitudinal shrinkage with a temperature parameter of 180 °C, cooling time of 33 s, 130 bar at injection hydraulic pressure produced 0.9424%. In the transversal shrinkage defect the optimum factor is 200 °C, cooling time 23 s, 125 bar at the injection hydraulic pressure produced 3.5%. In the longitudinal sink mark defects the optimum factor is 200 °C, cooling time 23 s, 135 bar at the injection hydraulic pressure produced 0.620 mm. In the longitudinal sink mark defect below the optimum factor is 190 °C, the cooling time is 33 s, 125 bar at the injection hydraulic pressure produced 0.6 mm. The transversal sink mark defect of the optimum factor is 200 °C, cooling time 23 s, 130 bar at the injection hydraulic pressure produced 0.0887 mm. In transversal sink mark defects under the optimum factor is 200 °C, cooling time 33 s, 130 bar at injection hydraulic pressure produced 0.109 mm.

Keywords: injection molding, parameters process, Taguchi method, polypropylene