

ABSTRACT

Among the applications in the medical field, orthoses or devices designed to stabilize and retard the motion of human limbs is one application of AM which is very useful because it can provide better performance when made in accordance with the patient's body shape. A study that discusses the application of AM in the medical field, especially orthosis is the study of customized short arm cast product. The product has not done the testing and repair phase. To ensure the product is feasible, it is necessary to test the product. The test will be performed on the short arm cast product design that has been produced that is simulation to ensure the product feasible in terms of strength when exposed to the force or impact from outside so that the product is not damaged, and simulated to know whether the product has good air circulation to prevent the occurrence irritation on the skin of cast users. Simulation of product strength is done by using finite element method (FEM) with structural simulation and simulation of air circulation using fluid flow. After the simulation, the results of the product still need improvement due to the deformation of 6.2940 and 6,0054 and the FOS of 1.1514, 1,2308, and 1.9577 which exceeds the allowed gap of 5mm and FOS minimum 2. From the results of the improvements are then carried out the test, obtained a design with a thickness of 2.5 mm and 10mm air circulation holes that have been tested in terms of strength and air circulation.

Keywords: *testing, short arm cast, simulation, product feasibility, improvement*