

ABSTRACT

Paper is used by humans for various needs, such as food packaging. One of the requirements that paper can be used as a food packaging paper is stronger in dealing with the burden of ordinary paper. To make it stronger, the paper is coated by a variety of blends derived from petroleum or fossils. In fact, the available petroleum or fossil reserves are getting smaller due to the exploitation of petroleum sources. Besides, the use of fossil fuels can damage the environment. For this reason, the use of bio-based materials is a good alternative. Starch is a bio-based material that is very cheap, easy to find, and commonly used in papermaking. Knowing those facts, researcher is interested in finding better material to replace fossils in the making of paper-based food packages. Samples, in the form of 140 sheets of cut newspaper. Each was given different treatment then tested for strength through a dynamic load test. The results of the dynamic load test were analyzed using the Response Surface Method (RSM) using the Minitab 17 software. The software predicted which combination of variable has the best response. According to the software, the best combinations were 5 grams of cornstarch with five times rubbed (480,2451kPa), 3.5 grams of tapioca with five times rubbed (563,4029 kPa), and 5 grams of rice starch with five times sprayed (515,8051 kPa). Then the samples were compared with the strength samples that get maximum results from dynamic load tests using the PN-BSM600 Bursting Strength Tester machine. From this comparison, it can be concluded that the RSM method is quite good at predicting a combination of factors that are expected to get the maximum response. Researcher also found that the addition of starch solution makes the paper stronger in holding the load given. Another thing that can be obtained is that different coating methods can affect the results of sample strength tests.