DETERMINATION OF PARAMETER SETTING OF FOAMING PROCESS OF SPONGE SHEET SLAA PRODUCTION USING TAGUCHI METHOD (A CASE STUDY AT PT X MOJOKERTO)

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ABSTRACT

Sponge Sheet SLAA is one of PT X’s product and it’s two critical to quality characteristics (Critical To Quality/CTQ) are thickness and wide. Specifications of it’s thickness and width each is 2.20 ± 0.5 mm, and 1370 ± 20 mm. Sponge Sheet SLAA produced using foaming oven machine which has three main process variables, i.e., conveyor speed, heating drum roll speed, and embossing roll speed. Presently, there are many Sponge Sheet SLAA produced which do not meet the specifications of it’s thickness and width.

An experiment was conducted to determine the optimum settings of those three process variables of foaming oven machine based on Taguchi method with dual performance characteristics (thickness and width). Since there are three process variables and each having three levels, the experimental design used is the L9 orthogonal matrix. Optimization was conducted by using the Taguchi method that utilizes the principle of total loss functions and weighting factors. The reduction of losses if Sponge Sheet SLAA’s thickness and width do not meet it’s specifications were also calculated.

The results shows that the embossing roll speed is the variable process that has the greatest contribution in reducing the variation of Sponge Sheet SLAA’s thickness and width simultaneously. To produce Sponge Sheet SLAA that has minimum variation at it’s thickness and wide, embossing speed, conveyor speed, heating drum roll speed, each setup at 4.2 m/min, 3.8 m/min, and 3.8 m/min. The reduction of losses for Sponge Sheet SLAA’s thickness and width by using the optimized settings of process variables each is 50.47%, and 34.23%.

Keywords: Sponge Sheet SLAA, foaming process, thickness, width, conveyor speed, heating drum roll speed, embossing roll speed, Taguchi method, loss function.