ABSTRACT

PT Perkebunan Nusantara is a company that produce black tea. One of the step to make black tea is the process of drying tea leaves to have a water content of 2.5% - 3%. The company use Endless Chain Pressure (ECP) type machine. Inside the ECP machine there is a tray where the tea will be dried. On the other Hand tray that use today is often broken in certain location. This study goals to look for factors that affect the tray broken using Taguchi Method. The factors use in this study are adjusted to the company's standard operational procedure in order to maintain the product stay in good quality. The factors use are drying time, inlet temperature, and inlet velocity. Base on orthogonal array L_{16} (4^3) so that the experiment was obtained 16 times. Every data collection is simulated twice with Computational Fluid Dynamic (CFD) and Static Structural. The experiment result will be analyze using S/N Ratio smaller the better and ANOVA. It is known that the optimum factor for tea drying machine tray is time level 1 at 1200s; inlet temperature level 1 at 369.25K, and inlet velocity at 16m/s and 24m/s with stress's score 485.32 MPa. The ANOVA test results showed the significant factor to the stress's in this study is inlet temperature with P-value 0,000.

Keyword: Taguchi Method, Computational Fluid Dynamic, Static Structural, Tray, Stress's score.