LUBRICANT PRODUCTION PROCESS QUALITY CONTROL USING COMBINATION CONTROL CHART OF MEWMA

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ABSTRACT

An oil company produces lubricant with Calcium (Ca), Zinc (Zn) and Total Base Number (TBN) as its ingredients. Quality control is applied in production process so that the products appropriate with the standard specification. Statistical quality control call Calcium (Ca), Zinc (Zn) and Total Base Number (TBN) as the quality characteristics. Control chart had developed by Shewhart (1920) to monitor quality characteristic and improves process capability. Hotelling (1947) developed control chart for multivariate case and it’s called Hotelling control chart. Hotelling control chart is Shewhart control chart generalization. Hotelling control chart is effectively used to monitor process mean if large shift occur. Furthermore, Multivariate Exponentially Weighted Moving Average (MEWMA) is developed by Lowry, et all (1992) to monitor process mean with small shift. The control chart is usually used individually but Reynolds & Stoumbos (2008) developed combinations control chart of MEWMA to control process mean and process variability. In this research, combination control diagram is used to control the lubricant production which quality characteristics is consist of Calcium (Ca), Zinc (Zn) dan Total Base Number (TBN). The Simulation results shows that MEWMA diagram control limit gives 11,255 for process mean and 18,799 for process variability. The phase I control chart shows that process variability is not controlled. The phase II Control chart shows that process mean and process variability are not controlled. Process capability index as 0,7275 shows that the process is not capable.

Keywords: Control chart, MEWMA control chart