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Statistical techniques to improve the quality of rubber hot water bottles

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This study is mainly concerned about the production of hot water bottles by a bottle manufacturer in Galle. The main problem encountered by the manufacturer was the increase of number of defects in the product. This problem could have been arisen due to variation in the quality of rubber material used. Viscosity, hardness, TS2 and TC90 are four main factors of the rubber compound that needed to be considered. At present, some specific ranges of above factors are used as quality standard limits, but it appears that the values are incorrect. Therefore, this study was conducted to identify appropriate control limits of above factors to get high quality products. The main objective of the research was to reduce number of defects by controlling the limits of four main factors. Descriptive statistical analysis has been used to obtain the appropriate limits for the above factors, and multiple regression analysis technique is used to obtain the regression model which describes the relationship between the defect proportion percentage and the above factors. Simulation techniques were used to compare the number of defects that may be obtained using current range and the proposed range. The improved ranges were used to check whether defects of the production process has reduced.

Key words: Defects, hot water bottle, TS2, TC90

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