Defective Reduction in Printing Process of Flexible Packaging Using Six Sigma Approach: A Case Study of Thai Manufacturing.

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- **Abstract:** The purpose of this study were 1) to deploy six sigma approach to reduce the defective in off registration and smearing color in printing process of flexible packaging 2) to investigate root cause and determine corrective action plan of off registration and smearing color problems. Six sigma approach consists of 5 steps, i.e. Define Phase, Measure Phase, Analyze Phase, Improve Phase and Control Phase. In this study, off registration and smearing color problems in printing process from a case company were chosen, from various defects and numbers of customer complaint. The first phase aimed to determine the repeatability and reproducibility of attribute Gauge R&R study. Using the process map analyzed the root cause and selected the key factor from Cause and Effect Matrix, Then, the key factor were analyzed their defect characteristic and effect from FMEA (Failure Mode Effect Analysis). After that, the actual root cause was analyzed, corrective action and preventive action plan were established in order to decrease defect and prevent repeatable problems. After applying six sigma approach from July'2020 to February'2021, it was found that defects in printing process could be reduced up to 50% (from 14.3% to 7.2%). When comparing with level, it can be improved from 2.6 to 3.0. The results also revealed that off registration defective can be reduced from 5.1% to 2.6%, and smearing color defective could be reduced from 3.7% to 1.4%. Therefore, if management teams control the process constantly, waste would be reduced continuously.

- **Keywords:** Six sigma, FMEA (Failure Mode Effect Analysis)