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Reduction of Defects in Casting and Finishing Processes Through DMAIC Phases

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Abstract: Currently organizations apply continuous improvement methodologies to increase productivity and competitiveness in order to satisfy the expectations from their customers. The Six Sigma methodology focuses on the elimination of defects and the reduction of waste and costs to achieve the highest quality in products, processes and services. The basis of Six Sigma methodology is DMAIC procedure, which constitutes a system for solving problems. This paper presents three projects focused on the reduction of defects in polishing and chrome processes, PVD coating and casting process of a company that manufactures faucets for home. Each project was structured in DMAIC phases (Define, Measure, Analyze, Improve and Control) with the purpose of significantly impact the quality of the end product. In the Define phase, identification of the improvement project and team members were carried out based on the voices from the customer, business and environment. During the measurement phase, the Critical To Quality (CTQ) characteristic was selected and the data collection was carried out. The analysis phase revealed the possible causes of the problem through the analysis of the data. In the improvement phase, the solutions to the problem were identified and validated. In the control phase, project closure activities were carried out to ensure that the solutions will last over time. Additionally, other techniques were applied, such as the seven basic quality tools, process mapping, impact matrices, brainstorming, standardization and statistical process control. The results show that for the analyzed models, a reduction of defects in the polishing and chrome processes of 41.92% was obtained. Also a reduction of defects in PVD coating process of 33.31% was obtained.

Keywords: DMAIC, reduction of defects, quality, process