

ANALISIS PERBAIKAN KUALITAS MENGGUNAKAN METODE *SIX SIGMA* DMAIC PADA PROSES *INJECTION MOLDING*

(STUDI KASUS: PT ANUGERAH BERSAMA SEJAHTERA)

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ABSTRAK

Tingginya tingkat produk cacat pada proses injection molding di PT Anugerah Bersama Sejahtera, dengan rata-rata 402 unit cacat per bulan dari total rata-rata produksi 24.869 unit, mendorong dilakukannya penelitian ini guna menganalisis dan memperbaiki kualitas produksi *Fan Cover*. Penelitian menggunakan metode *Six Sigma* dengan siklus DMAIC (*Define, Measure, Analyze, Improve, Control*). Pada tahap *Define*, diidentifikasi jenis defect dominan melalui *diagram SIPOC* dan *Diagram Pareto*, yaitu *Short Mold* dan *Banding*. Pada tahap *Measure*, diperoleh nilai DPMO sebesar 2.763,1 dengan Level Sigma 4,3204. Pada tahap *Analyze*, akar penyebab *defect* diidentifikasi menggunakan *Fault Tree Analysis* dan *Failure Mode and Effect Analysis*, mencakup faktor manusia, metode, mesin, material, dan lingkungan. Pada tahap *Improve*, disusun delapan usulan perbaikan menggunakan metode 5W+1H. Pada tahap *Control*, lima usulan perbaikan berhasil diimplementasikan, menghasilkan penurunan DPMO dari 2.763,1 menjadi 434,7 dan peningkatan Level Sigma dari 4,3204 menjadi 4,8330. Seluruh proporsi defect pasca-implementasi berada dalam batas kendali normal, mengindikasikan proses produksi berlangsung stabil dan terkendali. Hasil penelitian ini dapat dimanfaatkan sebagai acuan pengendalian kualitas berkelanjutan pada industri manufaktur plastik.

Kata Kunci: *Six Sigma*, DMAIC, *Injection Molding*, DPMO, Pengendalian Kualitas.

ANALYSIS OF QUALITY IMPROVEMENT USING THE SIX SIGMA DMAIC METHOD IN THE INJECTION MOLDING PROCESS

(CASE STUDY: PT ANUGERAH BERSAMA SEJAHTERA)

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ABSTRACT

The high defect rate in the injection molding process at PT Anugerah Bersama Sejahtera, averaging 402 defective units per month out of an average total production of 24,869 units, motivated this study to analyze and improve the quality of Fan Cover production. This research applied the Six Sigma method using the DMAIC cycle (Define, Measure, Analyze, Improve, Control). In the Define phase, the dominant defect types, Short Mold and Banding, were identified through SIPOC diagrams and Pareto Analysis. In the Measure phase, a DPMO value of 2,763.1 and a Sigma Level of 4.3204 were obtained. In the Analyze phase, root causes were identified using Fault Tree Analysis and Failure Mode and Effect Analysis, covering human, method, machine, material, and environmental factors. In the Improve phase, eight corrective actions were proposed using the 5W+1H method. In the Control phase, five improvements were successfully implemented, resulting in a DPMO reduction from 2,763.1 to 434.7 and a Sigma Level increase from 4.3204 to 4.8330. All post-implementation defect proportions remained within control limits, indicating a stable and controlled production process. These findings can serve as a reference for continuous quality control in the plastic manufacturing industry.

Keywords : Six Sigma, DMAIC, Injection Molding, DPMO, Quality Control.