

PENERAPAN *STATISTICAL QUALITY CONTROL* DAN METODE *TAGUCHI* PADA PART G4-28 DI PT XYZ

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ABSTRAK

PT XYZ merupakan perusahaan pengecoran logam yang memproduksi part G4-28, yaitu komponen pada turbocharger mesin kereta api Wabtec. Penelitian ini bertujuan untuk mengidentifikasi jenis defect dominan, menganalisis kestabilan proses, serta menentukan usulan parameter proses optimum menggunakan metode Statistical Quality Control dan Taguchi. Data yang digunakan adalah data produksi dan defect part G4-28 selama Juni–Agustus 2025. Hasil pengolahan data menunjukkan bahwa dari 1.440 pcs produk yang diinspeksi terdapat 428 pcs defect dengan defect rate sebesar 29,72%. Berdasarkan diagram Pareto, defect shrinkage menjadi jenis defect dominan dengan jumlah 268 pcs atau 63% dari total defect. Hasil *checksheet* dan *histogram* menunjukkan bahwa proses produksi belum sepenuhnya stabil. Metode Taguchi menggunakan rancangan L9 dengan faktor suhu peleburan, waktu holding, dan jumlah lapisan shell. Kombinasi parameter optimum yang diperoleh adalah suhu peleburan 1430°C, waktu holding 15 menit, dan 7 lapisan shell. Hasil ANOVA menunjukkan faktor belum signifikan secara statistik, namun waktu holding dan jumlah lapisan shell memiliki kontribusi terbesar jika dilihat dari *S/N ratio*.

Kata kunci: Statistical Quality Control, Taguchi, shrinkage, investment casting

APPLICATION OF STATISTICAL QUALITY CONTROL AND TAGUCHI METHOD ON PART G4-28 AT PT XYZ

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ABSTRACT

PT XYZ is a metal casting company that produces the G4-28 part, a component used in the turbocharger of a Wabtec railway engine. This study aims to identify the dominant defect type, analyze process stability, and determine the optimum process parameter recommendation using Statistical Quality Control and the Taguchi method. The data used in this research consist of production and defect data of the G4-28 part from June to August 2025. The results show that out of 1,440 inspected products, 428 defects were found, resulting in a defect rate of 29.72%. Based on the Pareto diagram, shrinkage was the dominant defect, with 268 pcs or 63% of the total defects. The checksheet and histogram analysis indicated that the production process was not fully stable. The Taguchi method was applied using an L9 orthogonal array with three factors: melting temperature, holding time, and number of shell layers. The optimum parameter combination was 1430°C melting temperature, 15 minutes holding time, and 7 shell layers. ANOVA results showed no statistically significant factors, but holding time and shell layers had the highest contribution if seen on S/N ratio.

Keywords: *Statistical Quality Control, Taguchi, shrinkage, investment casting*