

Case Study

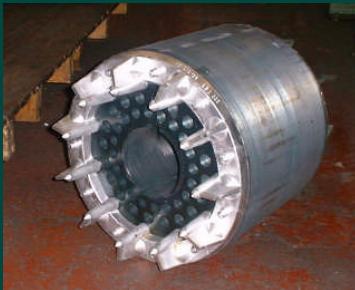
93% reduction in rotor die casting scrap



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Project background

A rotor die casting department produced all the rotor cores used in the assembly of large electric motors. The process had been working well for years until a sharp upturn in defective castings occurred.



Problem

Under normal operating conditions the control measures in place had given a relatively low, even level of defects. Operators used a comprehensive set of fault code references. However a huge increase in defective castings began to occur.

The process experts had suspicions about a change in the process. As a result this problem was selected as a Six Sigma project. Cost of scrapped rotors had risen to €71,000 per annum, with a huge increase in failure rates to 82,000 parts per million.

Additional administrative follow up cost a further €20,000 per annum. Time spent in re-work resulted in the company missing its customer delivery date promises.

Solutions

The team discovered, following detailed process mapping, failure modes and effects analysis and hypothesis testing, that the root cause of the problem was incorrect temperature in the metal well and at the aluminium injection stage on one of the press lines.

A faulty thermocouple was replaced with a new unit. Socket head screws holding down the vent ring had sheared heads, as a result of aluminium pushing through the vent ring along with the process gasses.

The team recalibrated the thermal probes, and clarified the calibration and certification process of the control panel temperature gauges and thermocouples. Measurement of temperature was added to the controls. The optimum temperature specification was redefined and included in standard operating procedures and control plans.

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Business benefits

Direct scrap costs were reduced by 76%. Defective casting scrap material costs were reduced by €55,000 per annum, rework was eliminated and customer delivery performance returned to acceptable levels. The overall failure rate decreased by 93%.