

## **Identifying the critical moulding machine parameters affecting injection moulding process by basic statistical process control tools**

### **Abstract**

In injection moulding the processing condition have critical effect on the quality of the moulded products. Since there are many process parameters involved in an injection moulding process, identification of the critical parameters are very important. Simple techniques like the "Seven Basic Quality Control Tools (7 QC Tools)" can provide a very valuable and cost effective way to meet these objectives. This paper presents a case study for identifying the critical factors and its level affecting a plastic injection moulding process of a plastic cell phone shell call Front Cover by deployed some of the 7 QC Tools. The Pareto diagram help to identify that the highest defects (30%) was contributed due to shrinkage. The shrinkage defect cause the length and width of the Front Cover below the given specification limit. The Cause and Effect diagram help to decide to select the mould temperature, injection pressure and screw rotation speed as the machine input parameters (factors) and the length and width dimensions of the Front Cover as the response of the experiment. A full factorial design of experiments was conducted to study the effect of three injection moulding process parameters versus shrinkage defect. Finally, the critical process parameters and its level influencing the shrinkage were identified and the confirmation run shows that the shrinkage defect eliminated to zero percentage