

## **Experimental Investigations to Increase the Plastic Mould Tool Life**

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The tool life is the most important economical factor, it is the period in which the tool is working effectively and efficiently. The tool service life is determined by the material quality and the properties of the tool achieved by heat treatment through materials microstructures.

In this study, we are looking for the tool quality with the optimal service life for plastic extrusion and recycling. Böhler M340 ISOPLAST is a high-performance plastic mould steel due to its chemical composition, electro-slag remelting manufacturing and good properties regarding wear resistance, corrosion resistance and toughness. Due to the increased share of glass-fibre reinforced plastics, this quality is also increasingly suitable for this kind of processing.

Heat treatment plays a major role as it has a significant influence on the tool properties. In our experiments, samples from this steel quality were subjected to two different heat treatment technologies. The first with conventional heat treatment (CHT) after quenching was tempered twice and the second sample was cryogenically quenched (DCT) followed by three times tempering. After the heat treatments, the samples were subjected to hardness and toughness tests as well as microstructure analyzes.

The results showed that the microstructure of the DCT treatment specimen from this steel quality gives the longest service tool life for this application.

*Keywords: plastic mould tool, tool life, deep cryogenic treatment, retained austenite.*

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