

High-quality refurbishing of high pressure die casting tools with Laser Metal Deposition of the hot-work tool steel Dievar

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Die casting tools are subject to extreme thermal and mechanical stresses which manifest themselves in a variety of wear mechanisms and often premature failure. The necessary repair and maintenance of the tools result in enormous costs for the foundries and place a heavy burden on the economic efficiency of the die casting process. This is exacerbated by the fact that the manual repair welding usually used is heavily dependent on the skills of the person carrying out the work and can only be reproduced to a limited extent. As a result, the service life of the new tool cannot usually be achieved after a repair. In addition, the labor-intensive manual welding process will become increasingly difficult to implement in the future simply due to the lack of personnel availability. One promising approach to tackling this problem is automated and digitalized tool refurbishment using Laser Metal Deposition (LMD). Based on the detection and evaluation of the underlying failure mechanisms and the subsequent digitization of the tool, the combination of CNC machining and LMD enables a repair that would be impossible to carry out manually. This is done with the aim of generating economic benefits for the foundry through a reproducible and automated process by significantly extending the service life of the repaired tool.

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