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Increased service life of a plastic injection mold by using additive manufacturing.

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Additive Manufacturing (AM) is becoming more common as manufacturing technique and the obvious benefits of freedom of design and production speed can clearly be utilized in the manufacturing of tools and molds. One of the most important criteria in producing molds for plastic injection is service life. This paper evaluates a mold produced using the conventional machining method versus mold optimized using AM. The mold manufactured using AM was optimized for uniform cooling, hence the cooling channels was placed in an optimal position. The surface temperature was evaluated using thermal imaging and the service life was simulated as well as evaluated by measuring surface damages, mainly caused by thermal stresses. Additional, this paper also includes the evaluation of the properties of a new low alloyed tool steel optimized for AM. The tool steel was firstly atomized into AM powder size distribution and the physical properties such as size and shape distributions was evaluated. The printability of the AM powder was further evaluated be evaluating the printed properties.

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