



Facts

Challenge

Cost-optimised production of mould inserts for injection-moulded tools in serial production.

Solution

Replacement of hybrids with mould inserts produced by a fully additive and considerably more time-and-cost-efficient process, using an EOSINT M 280.

Results

- High-precision: Entire production of inserts using laser sintering technology
- Time-saving: Production time reduced by four weeks
- Economic: Component realisation now 25% more efficient
- Fast: Final mechanical processing stage now consists solely of smoothing



Tool insert and injection-moulding component: Thanks to conformal cooling the cycle time was reduced and the quality of the housing part improved (Source: LBC, FWB)

Plastic Manufacturer FWB Achieves Major Savings in Production Time and Cost Using Additive Manufacturing



e-Manufacturing Solutions

Powerful EOSINT M 280 supersedes hybrid solution of the tool insert

Short profile

FWB Kunststofftechnik GmbH stands for innovative developments and technical expertise in plastic injection-moulding technology. The company's fields of activity include injection-moulding tools, automation, and plastic components.

LBC LaserBearbeitungsCenter GmbH supplies tool inserts made using Additive manufacturing for tool and mould construction. The company possesses specialised know-how in the fields of contour-near tempering and thermal dimensioning of injection-moulded and die-cast tools.

Further information

FWB Kunststofftechnik GmbH
www.fwb-gmbh.com

LBC LaserBearbeitungsCenter GmbH
www.lasergenerieren.de

To ensure that Germany remains an attractive location for the production of injection-moulded tools and plastic components, toolmakers and component producers rely on innovative technologies and procedures that save time and minimise expense. For years, Eastern European producers have been able to supply tools and injection components at lower prices than the so-called high-wage countries, and now they are being joined by more and more suppliers from the Far East. That is why German plastics processors need to make as much use of innovative and economic processes as they can, to be able to meet this cost pressure effectively. FWB Kunststofftechnik GmbH has been working closely with LBC LaserBearbeitungsCenter GmbH, a producer of metal parts using Additive manufacturing. This cooperation has resulted in the present method for realising tool inserts for injection-moulding components.

Challenge

The project at hand was to manufacture mould cores for a 16-core production tool intended for the serial production of injection-moulded plastic components. The requirements placed on such components derive from the situation in Eastern European injection moulding production facilities described above. Product life cycles are becoming increasingly short, resulting in the need for greater flexibility in tool construction. It is of

great importance that a fast and inexpensive method of developing and realising moulds be employed and that it be suitable for use in highly automated, independently operating production cells. In other words, not only is it necessary to provide tools quickly and cost-efficiently, but they must continue to work with high precision over long periods of time.

Solution

In September of last year, LBC incorporated a new EOSINT M 280 laser sintering system into its manufacturing process. As a result, the company is now able to produce laser sintered components not only faster but also more cheaply, with a laser output that has doubled from 200 to 400 watts. The company is now able to weld tool steel 1.2709 in a variety of layer thicknesses more homogeneously than ever before. This increase in productivity offers interesting new

3D view of the inner cooling channels of the tool insert, which could not be manufactured using conventional machining (Source: LBC)



perspectives for LBC customers' tool and mould construction activities. As a manufacturer of tools and plastic components, FWB is one company taking advantage of this.

At the time of FWB's initial request, LBC proposed a cost-optimised hybrid solution. FWB needed to produce a hybrid blank for a mould insert with the maximum possible volume. First, LBC calculated the structure of the cavity to fit the capacity of their EOSINT M 270. After integrating and configuring the EOSINT M 280 unit, the project was recalculated and two of the 16 tool cores to be made for the new production tool were constructed on the new system.

Results

Inserts produced using the laser sintering technology have distinct advantages over conventional mould inserts. There is no other process that allows such flexible placement of the cooling channels in the tool inserts, so close to the component contour. The benefit of this is a more precise and uniform cooling pattern. Ralph Mayer, Managing Partner at LBC GmbH, explains: *"The cycle time and the quality of the parts are also better than if tools with conventional cooling were used."*

Another advantage is the greatly reduced post-processing. In the case of FWB, the inserts only had to undergo a single final processing stage of smoothing, to bring them fully in line with the company's quality requirements.

It was primarily the fact that these fully laser sintered components required only minimal post processing that made the decision-makers at FWB take a closer look at their overall costs. This revealed the following additional benefits: The fully Additive manufacturing method for tool inserts turned out to be 25% more economic for FWB than the original hybrid solution. The new laser sintering system saved them four weeks in production time. Moreover, the component structures displayed considerable stability compared with hybrid components, which would have been made up of two parts. It was no longer necessary to create a permanent joint between the pre-produced metal and the joined-on laser sintered section.

As a result of these findings, the production tool was finally manufactured in an additive process using the EOSINT M 280. Using the more powerful system for

production clearly demonstrates the financial benefits of the new manufacturing method, both for FWB as a customer and LBC as producer. Ralph Mayer also notes: *"What we have here is a classic win-win situation. Thanks to the new machine technology, we are able to supply our customers even more flexibly, and our customers also profit in terms of time, cost and quality. In this way, we are ensuring that our customers feel well looked after, benefit all around from our expert know-how, and maintain their faith in us for many years to come."*

"Another reason for the success of the cooperation with LBC is that both the management and the employees always think flexibly when it comes to finding alternatives to existing production processes. The specialists at LBC showed us a new production alternative with the EOSINT M 280, which has given us optimum results coupled with reduced time and production expenditure."

Michael Gerich, Head of Tool Management Department at FWB Kunststofftechnik GmbH

"By integrating the new EOSINT M 280 into our production, we were immediately able to offer customers a time- and cost-efficient alternative to hybrid component production. By directly transferring our construction data to the machines and performing the complete manufacture, even of components with large dimensions using laser sintering technology, our customers are able to benefit from valuable time and cost advantages in contour-near tool tempering."

Ralph Mayer, Managing Partner of LBC LaserBearbeitungsCenter GmbH

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