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New mass finishing process for the processing of workpieces made from zinc diecasting and brass

OTEC Präzisionsfinish GmbH from Straubenhardt, Germany is known for its innovative machine and process technology, which finds particular use in the clock and jewelry industry. Whether gold, platinum, silver or even ceramic - for every alloy, OTEC has a process to create the highest quality surfaces.

Now OTEC has developed a technology for the processing of zinc diecast parts. These parts for example are used for belt buckles, closures on hand bags, fashion jewelry etc.

Machine technology



Figure 1: Disc finishing machine CF 18 with Unisepa for separation

For this process, predominantly disc finishing machines of the CF series are used. The function of the machine is as follows:

The work container consists of a container open at the top, for which the bottom a bottom rotating disc. If we load 10x10 mm cone-shaped abrasives into the container and the turn the machine on, a toroidal, turbulent motion results. The workpieces are also placed in the container, while a compound/water mixture is automatically metered in. The compound is a tenside cleaning agent, which has the following tasks:

- Corrosion protection

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- Keeping the workpieces and abrasives clean
- Removal of dirt
- If required, the creation of bright surfaces

The compound/water mixture flows through the work container during the process and picks up the resulting grinding swarf. In this way, the workpieces remain relatively clean during processing.

Due to the centrifugal force principle, the abrasives and workpieces rub against each other under high pressure while moving in the same direction. This results in a high grinding or polishing effect.

After the end of the machining process the abrasive/workpiece mixture is dumped into a sieve and the workpieces are separated from the media.

The outstanding capability of the OTEC machines is characterized by the following features:

1. Optimal flow-oriented container design, i.e. the abrasives flow in the same direction as the work pieces. This results in a minimized impact effect. The result is smoother surfaces and even edge rounding.
2. Gap design: The area between the lower rotating unit (called disc) and the fixed container wall is the critical region in the disc finishing technology. Here it can lead to jamming of thin workpieces or chips and increased abrasion. Here, OTEC has many years of experience and can offer several variants, coordinated with the respective process; e.g. the so-called slide gap technology, which allows the gap to be set to "0".
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4. High flexibility: The CF machine from OTEC is suited for:
 - Deburring
 - Edge rounding
 - Polishing
 - Smoothing

of workpieces made of metal, ceramic, plastic etc.

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Procedure

The workpieces are normally processed directly after casting, i.e. processed in the OTEC CF machine without any kind of preliminary work.

As a rule, the work in this process is performed in 2 levels:

1st level - wet grinding

In the first level grinding is performed with a certain plastic abrasive (quality R). This particularly distinguishes itself with a good abrasion capability and at the same time creates a very smooth polishable surface. As a rule, the grinding process lasts for approx. 2 hours. Afterwards the casting skin is completely removed and the surfaces are nearly nonporous. Thanks to the very smooth surface (Ra approx. 0.08 µm) the subsequent polishing process is very short.

2nd level - wet polishing

In the second level processing is done with special polishing chips which have the task of further smoothing the surface without creating "orange skin" in the process.

This polishing chips of quality P have as a rule a cylindrical form and are extremely abrasion resistant.

The utilized compound, which was specially designed for this application, creates very bright, smooth, shiny surfaces. The polishing process only takes around 30 minutes.

The result is surfaces of the highest quality. Thanks to the short processing time, high machine efficiency results. Thus a CF 18, for example, can produce 2-3 kg of workpieces in around 2.5 hours; this corresponds to a production output of around 8-12 kg per day.

The CF disc finishing machines are available with container volumes of 9, 18, 32 or 50 litres. At one time, up to 6 work containers can be linked in an installation with one central control system.

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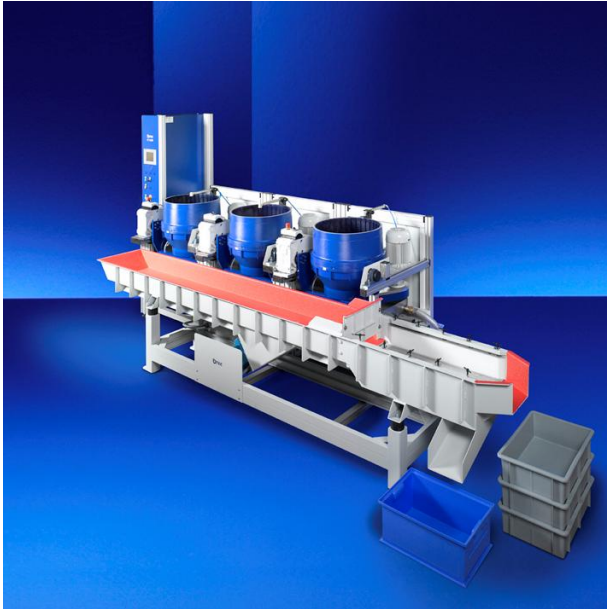


Figure 2: Disc finishing machine CF 3x50 with separation groove

Processing examples



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OTEC Präzisionsfinish GmbH

OTEC is a mid-sized manufacturer of drag finishing and disc finishing machines. Established in 1996 by Helmut Gegenheimer, the company has gradually found a place in the market thanks to new machine concepts and numerous patented processes. First in the jewelry industry, then increasingly in the tool, pharmaceutical, and automobile industries as well as in medical and CNC processing technology. The key to this was always new and better solutions which were superior to formerly used surface processing procedures. Today OTEC is a technological leader in many markets and globally present with its own international locations.

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