

Technical report

Mass finishing of stampings

The mass finishing of stamped parts is generally necessary in order to

- debur the workpieces
- round their edges (e.g. threading parts for the textile industry)
- smooth and polish the surfaces

For the mass finishing of these workpieces, the preferred process today is the use of disc finishing machines, since their centrifugal technology makes them especially suitable for processing small, light workpieces quickly and efficiently.

The operating principle of these disc finishing machines is as follows:

- The process container consists of a drum with a turntable in the base.
- This drum is then filled with abrasive media, e.g. triangular granules with a grain size of 4 x 4 mm.
- When the machine is then switched on, a toroidal vortex is created (see Fig. 1).

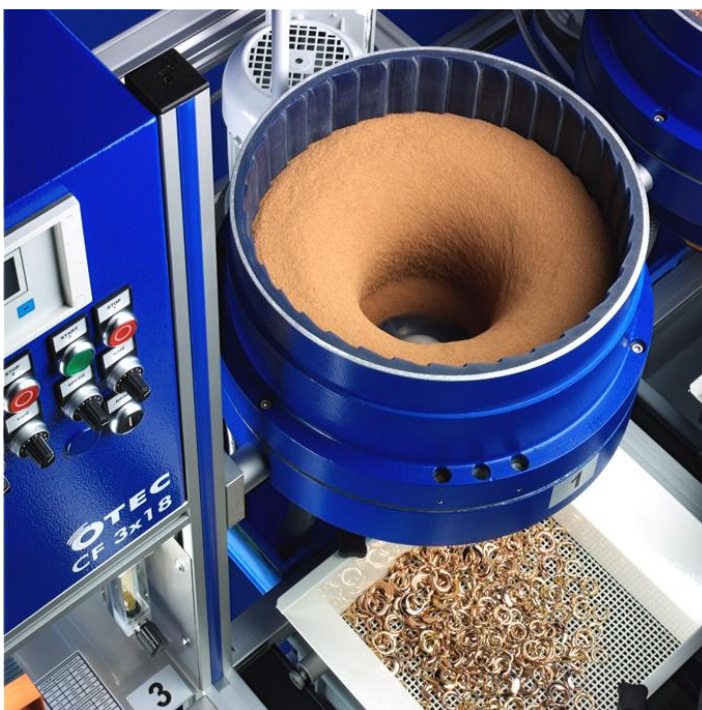


Fig. 1

Now the workpieces are inserted. A compound/water mixture is automatically added in the correct dose. The compound is basically a tensidic detergent which fulfils the following tasks:

- It protects against corrosion
- It keeps the workpieces and the grinding media clean
- It carries away the dirt
- If needed, it can create bright surfaces

During the process the compound/water mixture flows through the process container and carries away the material removed by the grinding process. This means that the workpieces remain relatively clean during the finishing process. Because of the centrifugal force, the abrasive media and the workpieces make contact as they move in the same direction under high pressure and this in turn brings about the grinding or polishing effect.

When the process is complete, the abrasive/workpiece mixture is tipped into a screen-type sieve and the workpieces are separated out.

Attention must be paid to the following special factors when processing stamped parts:

1. Processing very thin stampings

With traditional machines, thin stampings (thinner than 0.5 - 0.7 mm) can get caught in the gap (see Fig. 2) between the rotating disc and the fixed wall of the drum and can cause considerable damage.

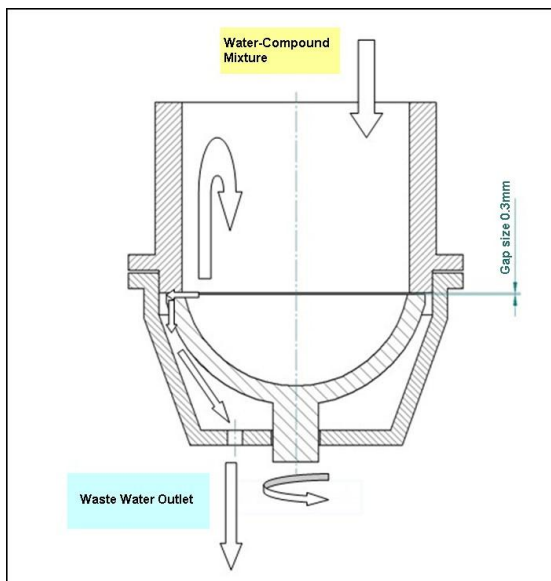


Fig. 2

This makes conventional disc finishing machines unsuitable for thin stampings (with a thickness of < 0.7 mm).

With the CF Series of disc finishing machines from OTEC, the size of the gap can be reduced to zero. This system, called the "zero gap system", is absolutely safe and totally reliable. It completely eliminates any danger of the workpieces becoming lodged in the gap and is therefore suitable for finishing very thin stamped parts.

Method of operation:

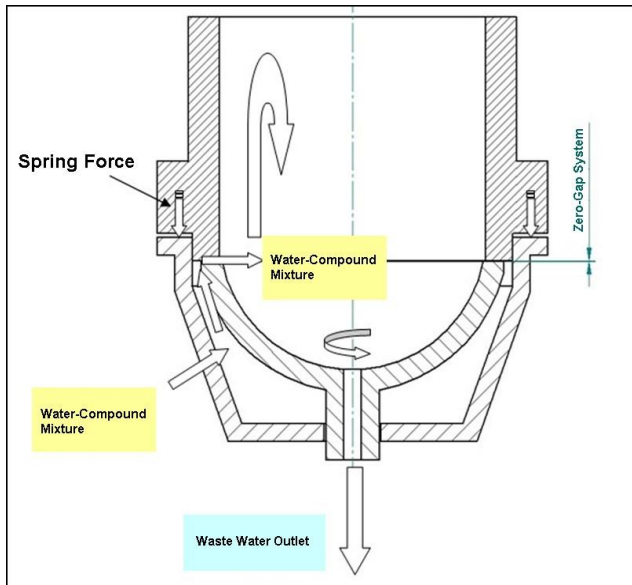


Fig. 3

With this zero gap technology, the compound/water mixture forces the top section of the container upwards, overcoming the spring force. This pressure causes a tiny gap to open so that the compound/water mixture can flow inwards. The result is a kind of “aquaplaning” effect. A thin film of compound and water is formed between the turntable and the upper section of the container, keeping the friction to an absolute minimum and also preventing the workpieces from entering the gap. The waste water drains away through the hollow shaft. (Fig. 3)

This system has proven itself on the market and is totally reliable in operation.

A further advantage of this system is that it is unnecessary to filter out tiny residues of abrasive as it is the case with conventional disc finishing machines. With this system it is also possible to use grinding powders, pastes or even sandblasting abrasives.

2. Use of a spray system

Small, thin stampings tend to cling to wet, vertical surfaces. This means that stamped parts may stick to the inner wall of the container during the process and may therefore not be adequately finished. The OTEC machines overcome this problem by periodically (at user programmable intervals) washing them off by means of a spray system (see Fig. 4), thus returning these workpieces back into the main stream of the finishing process. This guarantees that all workpieces are reliably processed.



Fig. 4

3. Separating of stampings

Small, light stampings can often only be separated from the media by means of a magnetic separator, since the abrasive medium often has a grain size similar to the size of the workpieces, rendering screen separation impossible. Drum magnets are not always 100% effective in separating out the workpieces because design limitations considerably reduce their field of efficiency.

This can be overcome by means of a magnetic discharge belt (see Fig. 5). This gives a much greater field of efficiency than a magnetic drum. And the reliability of the process increases accordingly. The system also incorporates automatic demagnetisation of the workpieces.



Fig. 5

Summary: With the aid of modern disc finishing machines using zero gap technology, small, thin stampings can be finished by mass finishing in a way that is both economical and reliable.



The company:

OTEC is a medium-sized manufacturer of drag-finishing and disc-finishing machines. Founded in 1996 by Helmut Gegenheimer, the company has successively established itself on the market through new machine concepts and numerous patented processes. Initially in the jewelery industry then increasingly in the tool manufacturing, pharmaceutical and automobile industries, as well as in the fields of medicine and CNC processing technology. The key to success has always been new, better solutions which are superior to the surface treatment processes previously used. Today OTEC is a technological leader in many markets and maintains a presence all over the world with branches of its own.

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