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OTEC introduces new two-stage drag finishing machine

The new DF-3 S2 two-stage drag finishing machine from OTEC represents a totally new innovation. For the first time, this machine makes it possible to grind and polish workpieces such as implants and watch cases with only a single clamping operation. The sophisticated technology achieves the quality of manual polishing combined with the reliability of an automated process.



Fig. 1: DF-3 S2 drag finishing unit (photo: OTEC)

Ever since the company was founded in 1996, OTEC has been actively engaged in the development of drag finishing machines. In this process, the workpieces are clamped in a holding device and dragged through a grinding or polishing medium. In order to make the process especially effective, the workpiece simultaneously turns on its own axis and describes a planetary motion (Fig. 2). All key parameters such as independent rotation, drag speed, immersion depth, compound concentration and of course processing time can be pre-selected by means of the Siemens touch panel. This makes the entire process extremely reliable.

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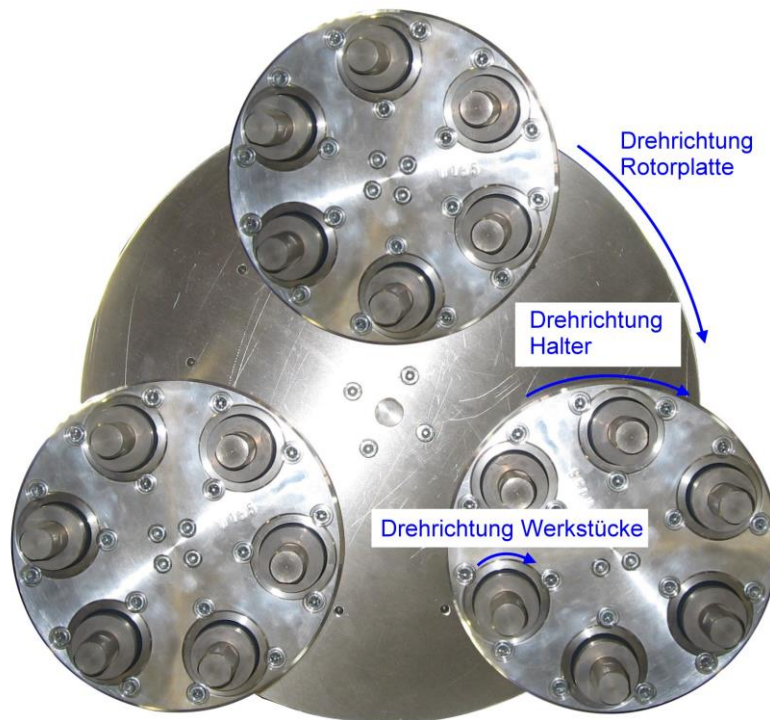


Fig. 2 (OTEC)

In order to process the workpieces efficiently and produce surfaces of the highest quality, a two-stage process is often required. This involves, for example, wet grinding the workpieces in the first stage and dry polishing them in the second. This enables, for example, workpieces in stainless steel to be smoothed from an initial Ra value of 3.25 μm to up to Ra 0.01.

Previously, two machines were needed for this process, e.g. one machine for wet grinding and a second machine for dry polishing, and accordingly a certain amount of manual work was involved in transferring the workpieces.

The new DF-3 S2, solves this problem. The machine has two process containers which can be combined to carry out wet/dry or dry/dry processes. A Siemens touch panel enables the various process parameters such as processing time, speed, etc. to be set. The machine carries out the individual stages of the process and therefore eliminates the time-consuming transfer of the workpieces, giving a considerable reduction in down time.

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Some typical applications for these machines include:

- Implants: e.g. knee and hip joints

After finishing, these particularly demanding workpieces must have absolutely smooth and scratch-free surfaces. For this application, the DF-3 S2 from OTEC is ideal. For example, the initial surface roughness of chromium cobalt or titanium knee joints after milling can be between Ra 1.0 μm and 2.0 μm . In the first stage, the workpieces are smoothed to a Ra value of about 0.06 μm by means of special abrasive media. This process can take from 2 to 4 hours. In the second stage, a new high-quality polishing granulate is used to polish up to 9 knee joints (in the larger machines correspondingly more) to a brilliant finish and a Ra value of approx 0.01 μm in only half an hour. This gives a completely scratch-free surface which satisfies the most stringent requirements.



Fig. 3: Knee joints (OTEC)

- Drive components, spindles

The drag finishing process is especially suitable for high-precision machine components such as worm gear shafts, spindles, and other precision ground drive parts. Since the parts are fixtured and can not touch one another and also given the fact that the parts follow a precisely defined path through the polishing medium, the drag finishing process ensures that the finishing results are extremely reliable and repeatable.

Typical applications for this process are:

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- Deburring fine threads
- Increasing the percentage contact surfaces of bearing seats
- Smoothing friction surfaces and sealing surfaces
- High-luster polishing, whereby the workpieces not only receive a top-quality appearance but also added protection against corrosion, all with Ra values of up to 0.01.



Fig. 4: Worm gear shaft (OTEC)



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OTEC Präzisionsfinish GmbH

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 jewellery 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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