

SF 3/105 stream finishing machine for series production

OTEC has developed the new SF 3/105 immersion finishing unit with pulse drive system specially to enable the system to be fully integrated into production lines for large-scale production runs. This unit type enables complex turned parts such as worm drives, cog wheels and camshafts to be deburred, rounded, burnished or polished in a matter of seconds. It is a very easy matter to adjust the unit to the production cycle time, which is often only a few seconds.



Fig. 1: Automatic loading of the SF machine

How the machine works:

The workpieces are clamped by means of a mandrel or similar device. Loading can be carried out manually, by the use of a handling system or by a robot (especially for series production). Processing is carried out by immersing the workpiece in a flowing stream of grinding or polishing medium. The media stream is generated by means of a rotating drum with a diameter of up to 1.05 m. The laminar flow velocity of up to 15 m/s ensures very short processing times.

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The pulse drive

The pulse drive system developed by OTEC delivers perfect results by constantly alternating the direction of rotation. During this process, the clamped workpiece is immersed in a media stream of grinding or polishing medium where it is alternately processed in each direction of rotation in a stream of grinding or polishing media. Decelerating and accelerating again to 2,000 rpm takes only half a second. This creates relative velocities of up to 30m/s and accelerations of up to 40 g. The main advantage of this is extremely short finishing times.

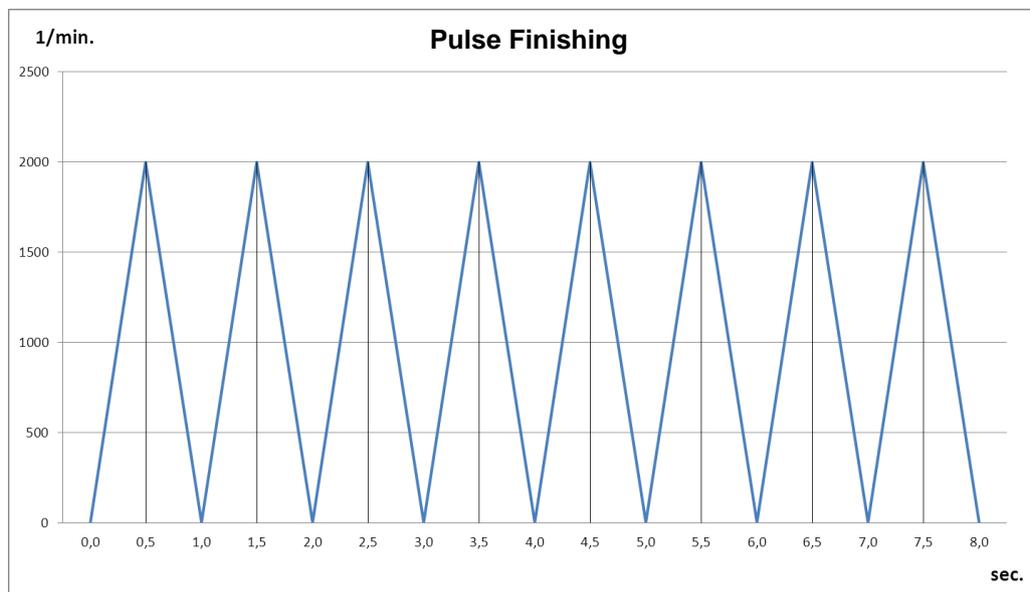


Fig. 2: Alternating direction of rotation

Additional features:

The angle of incidence can be adjusted by means of a servo motor and is therefore variable. It can be changed automatically during the finishing process. Predefined positions can be travelled to and stored in the program. This enables the flow to be adjusted to the precise requirements of the workpiece.

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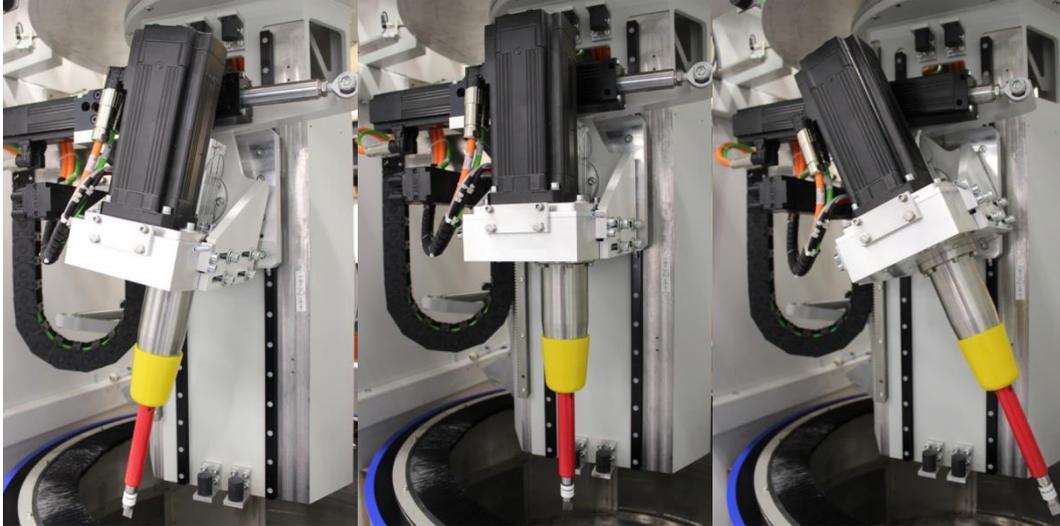


Fig. 3: The angle of incidence can be adjusted by means of a servo motor

A suction nozzle is fitted to continuously pump out the waste water and the sludge from the wet finishing process. The benefits of this system are obvious:

- » Constantly high rates of material removal
- » No sludge in the process drum
- » Grinding and polishing media are always kept clean
- » Clean workpieces



Fig. 4: Suction nozzle for extracting the waste water

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Example: finishing of forcer

Task description:

Debur and round the edges to approx. 70 μm whilst at the same time smoothing the surface from Ra 0.4 to below 0.2 μm .

Result:

The processing time required was approx. 30 seconds. This means that with an SF 3 with 3 pulse drives, one workpiece would be finished every 15 seconds.



Fig. 5: Before finishing

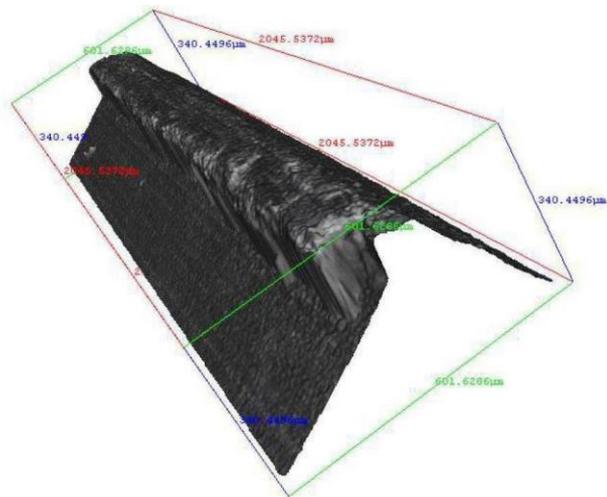


Fig. 6: Before finishing

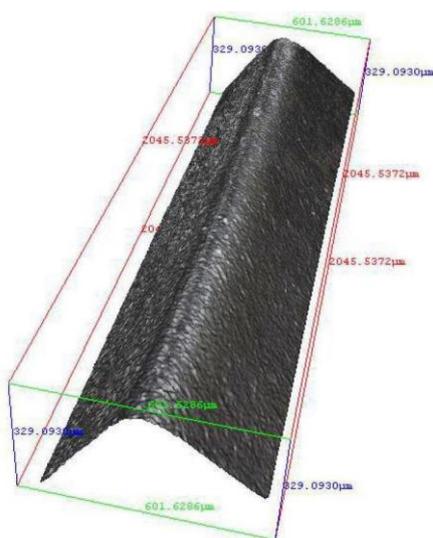


Fig. 7: After finishing

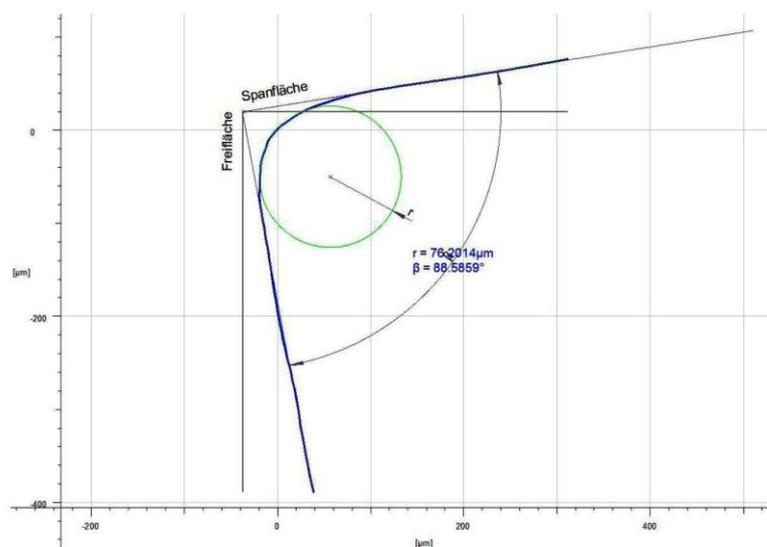


Fig. 8: After finishing



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The company:

OTEC is a medium-sized manufacturer of drag finishing, disc finishing and stream finishing machines. Founded by Helmut Gegenheimer in 1996, the company has steadily established itself on the market by developing innovative new machine concepts and numerous patented processes.

Initially this was in the jewellery industry, then increasingly in the tool making, pharmaceutical and automobile industries as well as in the area of medical devices and CNC machining. The key to success has always been the development of new, better solutions which have proven to be superior to previous surface finishing processes. Today, OTEC is the technological leader in many markets and maintains a network of branches worldwide.

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