

Precision finish
demands



PERFECT SURFACES THROUGH MASS FINISHING

OVERVIEW



THE DIFFERENT PROCESSES

Disc finishing

Mass finishing process, in which a rotating base plate sets workpieces and granulate in motion in a toroidal stream. The very intense finishing effect is up to 20 times more efficient than conventional vibrators.

Especially suitable for: small parts, large quantities of bulk goods

Drag finishing

In the drag finishing process, the workpieces are clamped in holders and dragged at high speed in a circular motion through a process drum containing grinding or polishing granulate. This generates contact pressure between the workpiece and the media, which in a very short time produces perfect results of a quality equivalent to that obtained by manual polishing.

Especially suitable for: large, heavy workpieces, single items

Stream finishing

In the stream finishing process, both the workpiece holder and the process drum rotate. This creates extremely powerful processing forces and gives very short finishing times.

Especially suitable for: deburring, polishing to a mirror finish and edge rounding of cutting tools, cog wheels, single items

Pulse finishing

In this variation of the stream finishing process, the clamped workpieces are repeatedly accelerated to a speed of over 2,000 rpm and then decelerated immediately. The considerable difference in velocity between workpiece and media create an extremely intense and precisely controllable abrasive effect.

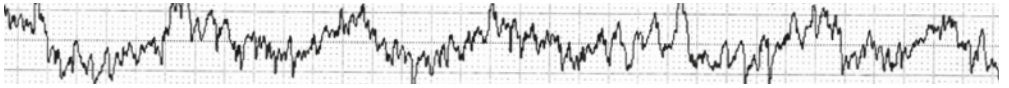
Especially suitable for: large series production, integration into in-line production, single items

PERFECT RESULTS

For a perfect finish, the right choice of mass finishing machine, abrasive media and finishing process are absolutely critical. The resulting perfect surface depends on many different parameters.

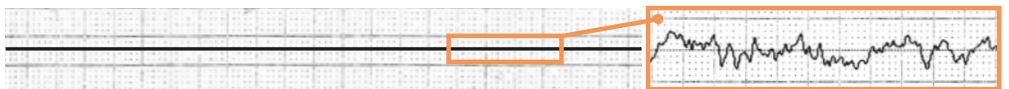
Surface finished on a CNC grinding machine

Ra: 1.23 μm , Rz: 7.9 μm

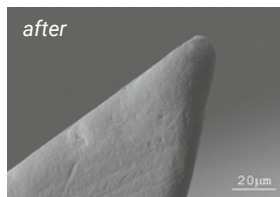
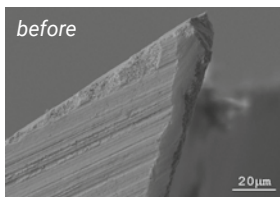


Surface after finishing in a DF machine

Ra: 0.01 μm , Rz: 0.1 μm



PROCESSING EXAMPLES



Edge rounding of a cutting tool

Material: tungsten carbide

Finishing time: 6 minutes

► Three-fold increase in tool life

DF Series



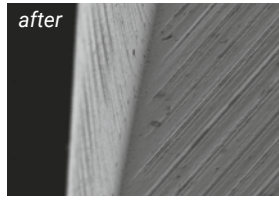
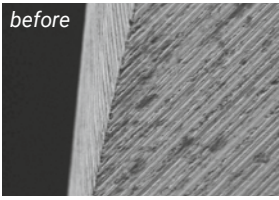
Deburring cog wheels, rounding and smoothing tooth faces

Finishing time: 2 minutes

► Up to 5 workpieces at the same time

► Rz value 1.5 μm reduced to 0.4 μm

SF Series

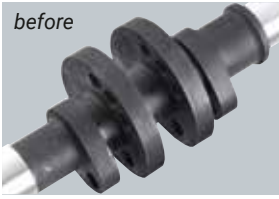


Rounding the cutting edges of cutting and stamping tools

Material: tungsten carbide

- ▶ Very smooth surfaces at the cutting edge, e.g. Ra 0.05 μm
- ▶ Considerable increase in tool life

SF Series



Deburring, rounding and smoothing of a camshaft

Process: PULSFINISH®

- ▶ Deburring, rounding and smoothing in approx. 60 seconds
- ▶ Ra before 0.4 μm , after 0.09 μm



Mirror-finish polishing of a knee joint

- ▶ Before: line ground
- ▶ After: absolutely scratch-free
Ra values up to 0.01 μm

DF Series



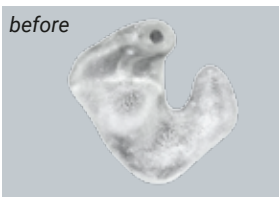
Polishing of workpieces made from ceramic and plastic materials

Material: ceramic

Very smooth, polished surfaces with low roughness depth (less than 0.2 μm)

- ▶ No deformation of the products

CF Series



Polishing of ear molds

For high-precision grinding of the contours of extremely rough surfaces and for creating very fine surfaces on plastic materials

Machine: ECO-Maxi

THE COMPANY

Founded in 1996, OTEC has quickly established itself as the market's technology leader by developing new machine concepts, inventions and improvements. OTEC supplies machines which are carefully tailored to the needs of specific industries and which are truly impressive in terms of cost-effectiveness, handling and precision and which are far superior to conventional systems. Around 100 members of staff are employed at the company's headquarters in Southern Germany. A global sales network ensures excellent worldwide support, and world beating finishing are always guaranteed.

EXPERT ADVICE AND SAMPLE FINISHING SERVICE

We will be happy to prove just how efficient our grinding and polishing machines really are. We provide detailed and comprehensive advice and will also develop for you a customized processing concept tailor-made to your specific application, including the right combination of grinding and polishing media. In addition, we will process a sample of the parts concerned and document all relevant process parameters. And the best thing is: this service is provided free of charge, without obligation and in absolute confidence.

**Put us to the test! You will be truly impressed by the result.
Simply send your workpieces marked "test samples" to:**

OTEC Präzisionsfinish GmbH

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From 01.11.2015: Heinrich-Hertz-Str. 24 | 75334 Straubenhardt | Germany

Phone +49 7082 4911-20 | Fax +49 7082 4911-29 | E-mail: info@otec.de | www.otec.de/en

MACHINE TYPES AT A GLANCE

► SF Series



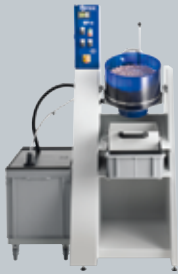
► DF Series



► CF Series



► ECO 18/EF Series



► HV 20/ECO-Maxi Series



► Separating Units



SF

PULSFINISH®

DF

CF

ECO 18/EF

HV 20/ECO-Maxi

SEPARATING UNIT

MEDIA

THE SF SERIES

The SF machines were developed for applications for which no satisfactory process previously existed, and which call for the highest possible surface qualities in the smallest of geometries. Very fine surface qualities with roughness values of only $Ra < 0.05 \mu\text{m}$ can be obtained even in the tiniest of flutes or grooves. SF machines are based on the principle of the stream finishing process.



Highlights

- ▶ Very short finishing times for deburring, edge rounding and polishing
- ▶ Path controlled sequence of movements, easy to automate
- ▶ When more than one tool holders are used, workpieces can be changed within process time

Machine dimensions

- ▶ Weight: 600 kg – 4 metric tons, drum diameter 780 – 2000 mm
- ▶ L x B x H: von 1620 x 1210 x 2100 mm to 3087 x 2410 x 2600 mm

Typical applications

Fully automatic edge rounding and mirror-finish polishing of tungsten carbide tools, cutters, drills, forming tools, reamers and gear wheels can be achieved by simply linking to a robot cell.

Core markets

- ▶ Tool manufacturers
- ▶ Gearbox manufacturers
- ▶ Automobile manufacturers
- ▶ Turbine manufacturers

PULSFINISH®

PULSFINISH® was specially designed for the requirements of in-line production in the automotive industry and the modern tool making industry. The machine features the innovative new pulse drive system. This enables the extremely stringent requirements of large in-line production in terms of reliability, production speed and processing quality to be consistently fulfilled.



Highlights

- ▶ Deburring, rounding and smoothing from e.g. Rpk 0,2 μm to Rpk 0,1 μm in less than a minute and in a single processing stage
- ▶ The contours of the workpiece remain highly intact
- ▶ Modular design



Special features

- ▶ Extremely cost-effective
The SF 3/105, for example, has three workpiece holders. This enables three workpieces to be processed at the same time and changed within process time independently of one another, since they can be controlled individually. This means that workpieces can be deburred, rounded, smoothed or polished in a matter of seconds.
- ▶ Modular design
The SF 3/105 can easily be integrated into a production line and operated fully automatically.

Core markets

Wherever extremely high demands are made in terms of precision in the deburring and smoothing of components, e.g.

- ▶ Automotive industry (camshafts, etc.)
- ▶ Toolmaking industry (thread cutting taps, etc.)

THE DF SERIES

The DF machines enable the very best results to be obtained in an extremely short time – in the form of precision edge rounding, smoothing or mirror-finish polishing in a quality equivalent to that obtained by manual polishing. These very compact and economical machines are used mainly in the toolmaking and medical industries. DF machines are based on the principle of the drag finishing process.



Highlights

- ▶ Edge rounding of cutting tools (much longer tool life)
- ▶ Smoothing and polishing
(better flow properties, lower cutting forces)
- ▶ Removing droplets (better chip flow)
- ▶ Deburring HSS tools (e.g. thread-cutting taps)

Versions

In addition to the classical wet and dry versions, there are also machines especially adapted to the requirements of specific markets:

- ▶ DF Tools for the toolmaking industry
- ▶ DF Pharma for the medical/pharmaceutical industry

Machine dimensions

- ▶ Weight: 310 kg – 850 kg
- ▶ L x B x H: from 1155 X 970 x 2010 mm to 1650 x 1300 x 2450 mm
- ▶ Process drum volume: from 80 liters to 170 liters

Core markets

- ▶ Toolmaking industry
- ▶ Medical devices
- ▶ Pharmaceutical industry
- ▶ Jewelry industry

THE CF SERIES

Machines in the CF series are suitable for small workpieces. These are finished loose in large quantities in a process drum and include items such as jewelry and precision cut, turned, milled and stamped parts. CF machines are based on the principle of the disc finishing process and are designed for dry, wet or oil finishing, depending on the type.



Highlights

- ▶ Fast, absolutely reliable and reproducible process
- ▶ Wide range of applications from deburring to mirror-finish polishing
- ▶ 20 times more efficient than, for example, conventional vibrators

Specialized OTEC know-how

- ▶ Ceramic/polyurethane gap system: the standard system
- ▶ Ceramic gap system: the gap can be adjusted to 0.05 mm for very thin workpieces
- ▶ Zero gap system: for wet finishing. The gap can be reduced to zero

Machine dimensions

- ▶ Weight: 118 kg – 1050 kg
- ▶ L x B x H: from 810 x 1000 x 1620 mm to 3940 x 1535 x 1950 mm
- ▶ Process drum volume: from 1 x 9 liters to 4 x 50 liters

The CF machines are available as free-standing, benchtop and semi-automatic machines.

Core markets

- ▶ Industry (stamped, milled or turned parts)
- ▶ Medical devices (implants, plastics, dental applications)
- ▶ Jewelry industry (all common materials, with or without gemstones)
- ▶ Non-ferrous materials (hard rubber, plastics, ceramics, etc.)



THE ECO 18/EASY FINISH SERIES

ECO 18/EF series is specially designed for wet finishing. These machines are inexpensive to buy and maintain and are ideally suited to deburring turned and milled parts. They are available as benchtop units ECO 9/18 or as free-standing machines Easy Finish 9/18/32. ECO 18/EF machines are based on the principle of the disc finishing process.



Technical features

The ECO 18/EF series uses a patented gap adjustment system. This enables even very thin workpieces with a thickness of 3 mm and over to be finished without becoming lodged in the gap. The patented quick adjustment system enables the gap to be adjusted quickly and easily. From 0.5 mm to 3 mm, depending on the customer's requirements.



Machine dimensions

- ▶ Weight: Weight: 45 kg to 145 kg
- ▶ Free-standing EF machines:
 - B x T x H from 611 x 755 x 1515 mm to 770 x 950 x 1620 mm
 - Process drum volume : from 9 to 32 liters
- ▶ ECO 9/18 benchtop units:
 - B x T x H from 565 x 565 x 720 mm to 640 x 740 x 820 mm
 - Process drum volume ECO: from 9 to 18 liters

Core markets

- ▶ Industrial applications, e.g. turned and milled parts



THE HV 20/ECO-MAXI SERIES



THE HV 20

The HV 20 is a high-performance vibrator which is especially gentle in operation and yet provides very intensive finishing. The result is much shorter processing times than with conventional tub vibrators.

Areas of application

- ▶ The HV 20 is especially suitable for long, thin workpieces

Core markets

- ▶ Mechanical engineering (e.g. broaches)
- ▶ Medical devices (e.g. bone plates)



THE ECO-MAXI (MAGNETIC, WET, DRY)

Either everything in just one machine, as a modular base unit for all three process types or as dedicated models for just one process each (ECO-Maxi "magnetic", ECO-Maxi "wet" and ECO-Maxi "dry"). The modular concept of the ECO-Maxi therefore makes it ideal for small-scale series production.

Areas of application

- ▶ Removing grinding marks
- ▶ Improving the surface to a hand-finish quality

Core markets

- ▶ Medical industry (e.g. ear molds, dental applications)
- ▶ Jewelry industry



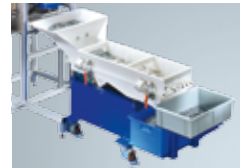
SEPARATING UNITS

Separating workpieces from the grinding and polishing media after finishing is a key component of the overall process. OTEC machine technology offers a variety of economical solutions which can make all the difference to the reliability of the process. Here, too, our specialized expertise ensures that the system is fine-tuned to your requirements and to the machines available.



Unisepa universal separating unit

- ▶ Universal, mobile and flexible
- ▶ Dosing slider, vibration frequency and amplitude are all adjustable
- ▶ Faster, easier screen change, controllable separating speed



Flow separation with the FS series

- ▶ The alternative to manual separation
- ▶ Adjustable flow rate of the separation medium
- ▶ Efficient, fully automatic separation, short processing times, extremely economical



Highly efficient separation with the MSR magnetic separating belt

- ▶ For ferromagnetic workpieces
- ▶ Precision control: distance between magnet and media/workpiece mixture, belt speed, magnetic separating belt and demagnetization
- ▶ Large operating range and downstream demagnetization



The special solution for absolutely reliable separation: SSR screen separator

- ▶ Integrated rinsing und blasting
- ▶ Up to three cascading stages for reliably turning the workpieces
- ▶ PU coating to reduce wear and noise emission
- ▶ With additional device for aligning the workpiece



PERFECT SURFACES

For each process, wet or dry, there is the corresponding media, the key to perfect results.



For wet finishing:

- ▶ Plastic
- ▶ Ceramic
- ▶ Stainless steel media
- ▶ Spherical zirconia
- ▶ Microfinishing media
- ▶ Wet grinding pastes and special compounds

For dry finishing:

- ▶ Walnut shell and corn granulates
- ▶ HSC granulates
- ▶ Dry grinding granulates
- ▶ Plastic polishing chips

For more detailed information, please visit:
info@otec.de

