Precision finish demands

OTEC

WHERE WE LIVE, QUALITY HAS A LONG TRADITION

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 processes at all times.

ECO MAXI SERIES

ECO MINI SERIES

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Precision finish demands

OTEC

SIMPLY BRILLIANT
HIGH-TECH JEWELRY POLISHING

PERFECT SURFACES WORLDWIDE

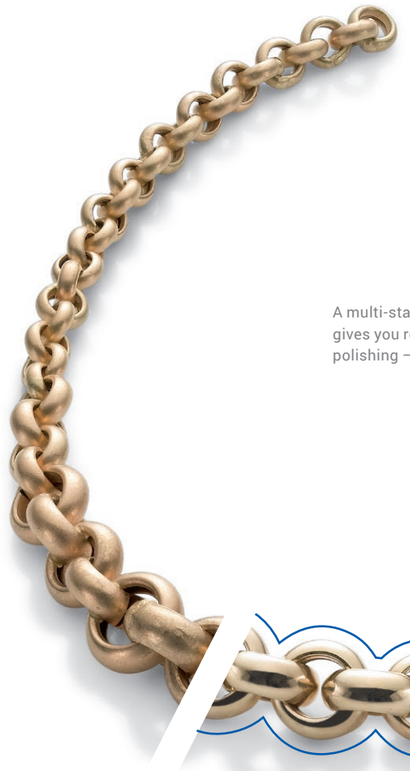
WE MAKE YOUR BUSINESS SHINE

OTEC has been the leading partner for surface finishing in the jewelry industry since 1999. More than 5,000 customers worldwide – from small businesses to global players – put their trust in our know-how.

We supply more than just machines. We supply reliably reproducible results. This is the combination of technology, process media, precisely coordinated parameters and above all – many years of experience.

We work closely together with you to decide which is the most cost-effective and most efficient solution. For classical jewelry finishing, our range includes disc finishing machines for the mass finishing process and electropolishing units.

We provide full after-sales support to ensure that your results are always brilliant.

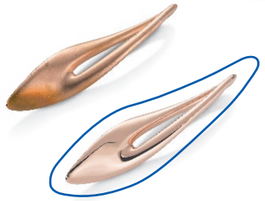


A multi-stage mechanized process gives you results comparable to manual polishing – even with complex geometries.

Wafer-thin material – laser-cut or stamped, is easily brought up to a high shine.

Electropolishing guarantees perfect surfaces even in the smallest gaps.

Extremely gentle processes fully protect valuable gemstones and materials during finishing.



WE SHINE WHEN POLISHING IS DIFFICULT

We love challenges. They motivate us to keep on developing and refining our machines and processes so that we can always offer our customers the solution that is absolutely right in every case.

Gentle

Even in combination with sensitive materials such as pearls, gemstones or enameling, high-luster surfaces can be obtained with no risk to any of the components, and irrespective of the design of the workpiece.

Filigree

The newly developed electropolishing system puts a shine on previously inaccessible areas. This easily gives a much more detailed and brilliant finish to complex workpieces – without using any hazardous chemicals whatsoever.

Immaculate

The multi-stage processes are individually tailored to the particular workpiece so that up to 90 per cent of manual processing can be eliminated, even with complex finishing processes such as polishing hollow chains – but the result remains comparable to hand finishing.

Tolerant

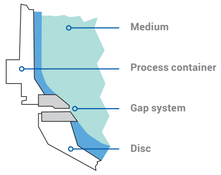
There is virtually no limit on how thin the material can be. The unique OTEC zero-gap system even enables wafer-thin workpieces to be reliably and efficiently finished.

OUR COLLECTION FOR YOUR PRODUCTION

Whether you are looking for a stand-alone solution or want to set up a production line – the OTEC CF series will always have the right machine for demanding jewelry finishing in any batch size.

All machines in the CF series work on the disc finishing principle whereby the workpieces are immersed in a drum-shaped container filled with grinding or polishing granulate and a disc in the base of the drum is made to rotate. The disc is separated from the wall of the container by means of an adjustable gap. The effect of the different centrifugal forces acting between the workpiece and the process medium produces perfect, uniform surfaces. This process is up to 20 times more efficient than conventional vibrators. With wet processing, the material removed by abrasion is constantly rinsed away by means of a water/compound mixture. The machines in the CF Standard series are modular in design and can be expanded to incorporate up to six process containers.

The innovative OTEC gap technology



The process container is available with a number of different gap systems:

Zero gap system:
For the wet finishing of very thin workpieces, the gap between the rotating disc and the stationary wall of the container can be reduced to zero. The advantage of this system is that it enables extremely fine grain abrasive to be used and eliminates any risk of workpieces becoming lodged in the gap.

Ceramic gap system:
Here, the gap is formed by two ceramic rings. This can be adjusted to precisely 0.05 mm. The advantage of this system is that it enables fine polishing granulates to be used in order to give the best results.

Ceramic/polyurethane gap system:
The OTEC standard. All-purpose wet polishing system. The advantages of this system are that the disc can not become jammed or blocked and it is a highly reliable process requiring very little maintenance.

OTEC CF Standard
Modular system expandable to 6 process containers.
With Siemens touch screen control.

OTEC CF Standard

- Suitable for wet/dry finishing
- Process container with hot molded PU lining
- Modular system, can be built with 1 to 6 process containers
- Aluminum profile frame construction for easy expansion
- Speed control via frequency inverter
- Siemens SPS touch screen control
- Digital display of all relevant process parameters
- Memory for up to 75 programs

OTEC CF Element

- Suitable for wet/dry finishing
- Process container with hot molded PU lining
- High-quality steel chassis
- Display: processing time, elapsed time and speed

OTEC CF-T

- Especially suitable for the dry finishing of jewelry
- Benchtop model with aluminum profile chassis
- Ceramic gap system
- Process container with hot molded PU lining
- Display: processing time, elapsed time and speed

OTEC CF Element
Stand-alone machine for both dry and wet processing

OTEC CF-T
Space-saving benchtop unit for dry finishing

TECHNICAL SPECIFICATIONS

Type	Container volume [l]	Container diameter [mm]	Width x Depth x Height [mm]	Weight [kg]	Power requirement [kVA/V]	
CF 1 x 9	1 x 9	257	810 x 1000x 1620	118	1,2 / 230	**CF series**
CF 2 x 9	2 x 9	257	1240 x 1000 x 1620	182	1,8 / 230	
CF 3 x 9	3 x 9	257	1670 x 1000 x 1620	220	3,0 / 230	
CF 4 x 9	4 x 9	257	2200 x 1000 x 1620	254	3,6 / 400	
CF 1 x 18	1 x 18	333	880 x 1000 x 1620	127	0,9 / 230	
CF 2 x 18	2 x 18	333	1380 x 1000 x 1620	200	2,0 / 230	
CF 3 x 18	3 x 18	333	1880 x 1000 x 1620	234	3,0 / 230	
CF 4 x 18	4 x 18	333	2405 x 1110 x 1760	350	4,5 / 400	
CF 1 x 32	1 x 32	410	1130 x 1120 x 1630	285	2,0 / 230	
CF 2 x 32	2 x 32	410	1960 x 1120 x 1630	520	4,5 / 400	
CF 3 x 32	3 x 32	410	2780 x 1120 x 1630	750	7,0 / 400	
CF 4 x 32	4 x 32	410	3610 x 1120 x 1630	900	9,0 / 400	
CF 1 x 50	1 x 50	485	1200 x 1535 x 1680	265	2,5 / 230	
CF 2 x 50	2 x 50	485	2120 x 1535 x 1680	450	5,0 / 400	
CF 3 x 50	3 x 50	485	3040 x 1535 x 1959	635	7,5 / 400	
CF 4 x 50	4 x 50	485	3949 x 1535 x 1950	1050	10,0 / 400	

Type	Container volume [l]	Container diameter [mm]	Width x Depth x Height [mm]	Weight [kg]	Power requirement [kVA/V]	
CF 5 T	5	190	575 x 400 x 680	30	0,4 /230	**SCF-T series**
CF 2 x 5 T	2 x 5	190	990 x 505 x 720	63	0,8 / 230	
CF 9 T	9	257	650 x 530 x 830	65	0,9 / 230	
CF 2 x 9 T	2 x 9	257	1145 x 545 x 865	116	1,8 / 230	
CF 18 T	18	333	725 x 600 x 845	80	0,9 / 230	
CF 2 x 18 T	2 x 18	333	1285 x 575 x 845	140	1,8 / 230	

Type	Container volume [l]	Container diameter [mm]	Width x Depth x Height [mm]	Weight [kg]	Power requirement [kVA/V]	
CF 18	18	330	720 x 910 x 1520	approx. 130	1,2 / 230	**CF Element series**
CF 32	32	430	1040 x 850 x 1650	approx. 170	1,5 / 230	
CF 50	50	485	900 x 1050 x 1610	approx. 180	2,3 / 230	

MACHINE AND PROCESS – THE DUAL SOLUTION

Ideally working on the basis of a sample workpiece, or alternatively by analyzing photographic data, our OTEC research lab will develop a process specially tailored to your workpiece and your application. Then we create a log documenting all the process parameters. This provides key information which enables us to determine the combination of grinding and polishing media that is just right for you. If you order a machine, this service is free of charge.

Example of a process log

Sample number:	1	**Manufacturing process:**	turned and milled part
Research task:	grinding and polishing	**Gap system wet finishing:**	gap system (0.4 mm)
Workpiece name:	rings	**Gap system dry finishing:**	micro-gap system (< 0.05 mm)
Quantity:	7	**Water flow rate:**	10 l/h
Material:	Gold	**Compound/water concentration:**	3 %
Plated:	✓	**Interval:**	

Machine: CF 3x18

Step	Time	Process	Media	Compound	rpm
1	2.0 h	wet grinding	T 10/PT 10 plastic abrasive	SC 5 compound	260
2	1.0 h	wet grinding	KM 10/PM 10 plastic abrasive	SC 5 compound	260
3	2.0 h	dry polishing	H1/100 impregnated walnut shell	P 1 polishing paste	250
4	30 min	dry polishing	H1/500 impregnated walnut shell	P 1 polishing paste	250

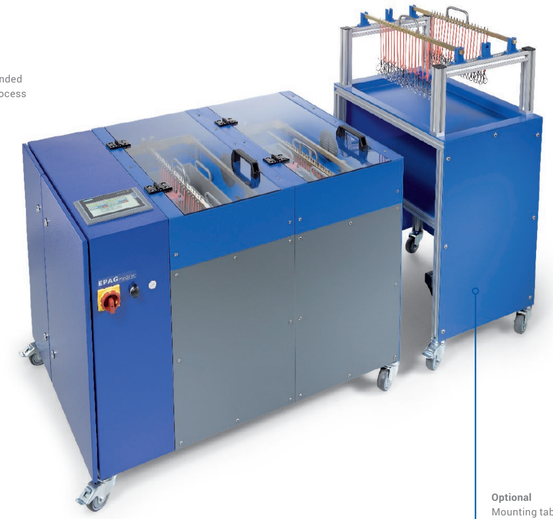
GENTLE FINISHING IN INACCESSIBLE AREAS

When it comes to polishing intricate details or inaccessible internal contours, electropolishing is the method of choice. The new OTEC EPAG Flex$_{modular}$ polishing unit combines top quality with great cost-effectiveness.

The EPAG Flex$_{modular}$ is an electropolishing unit for yellow, red and white gold, as well as for silver. This electropolishing unit enables filigree jewelry rings to be ground and polished in the shortest possible time. Intricate details remain intact and internal contours receive an excellent finish. Manual polishing is reduced to a minimum and the quality of your surfaces is greatly enhanced.

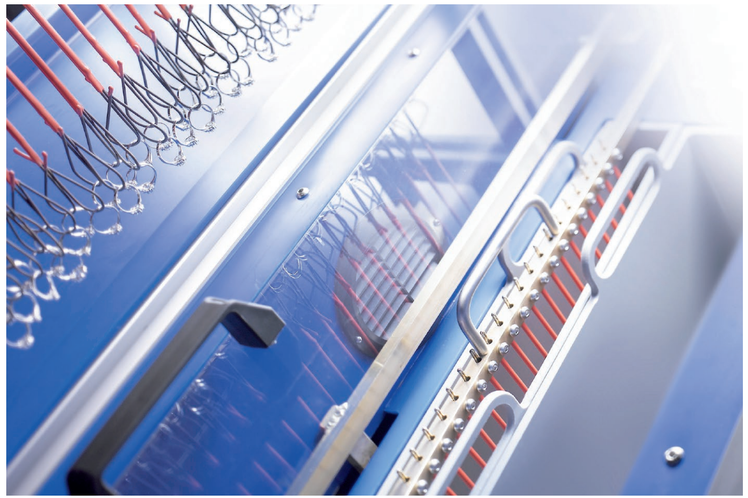
The modular design makes it easy and cost-effective to subsequently expand the system to incorporate up to three individually controllable process tanks. Workpiece-specific process parameters can easily be stored and managed in the parameter database included in the software.

EPAG Flex$_{modular}$
Modular design, can be extended to incorporate up to three process containers



EPAG Flex$_{modular}$

Optional
Mounting table and alternative holders



- Perfect for silver and gold
- Reduces manual polishing to a minimum
- Gold carried over into the bath during the electropolishing process can easily be recovered by filtering and depositing onto the cathode.
- Can easily be expanded to incorporate up to three process tanks
- Can process up to 40 workpieces per tank
- Workpiece parameter management system
- USB port for easy software updates and upgrades
- Filter unit for absorbing particles
- Completely cyanide-free process

Type	Container volume [l]	Width x Depth x Height [mm]	Weight [kg]	Power requirement [kVA/V]
EPAG 1	18	900 x 750 x 800	135	2.6 / 230
EPAG 2	2 x 18	900 x 1200 x 800	220	2.6 / 230
EPAG 3	3 x 18	900 x 1650 x 800	305	2.6 / 230

MANY VARIABLES FOR PERFECT RESULTS

We find the right parameters for each task, and we supply the right ingredients for each process. From grinding pastes and powders, polishing media and granulates to ready-to-use compound solutions.

The finished quality of any surface depends mainly on choosing the right process media for the machine being used. In each individual case, the process media is selected which is right for the specific workpiece in hand. Processes are divided into wet and dry finishing. In the case of wet finishing, a water/compound mixture is generally used to absorb and carry away the material removed from the workpieces by the abrasive action of the media. This keeps the system working efficiently, since the abrasive media cannot clog or accumulate on the parts or in the bowl.

Dry finishing is mainly used for polishing. This process either uses polishing media pre-impregnated with polishing paste or powder, or the polishing agent is added during the process. The mass finishing process brings the moving polishing media into contact with the workpiece, thereby removing material. The result is a highly polished surfaced.

Plastic granulate
For electropolishing

Wood grinding chips

Ceramic abrasives
For steel alloys

Walnut shell granulate
For mirror-finish dry polishing

Stainless steel media
For precious metals

Plastic grinding chips

These high-quality grinding chips offer high stock removal rates and a fine surface finish. Their soft bond prevents any hardening or pitting of the workpiece surface. Plastic bonded grinding media are mainly used for the grinding and fine grinding of precious metals.

Type	Color	Grinding effect	K Conical Size a mm	P Pyramid Size a=b mm
M	mint green	fine grinding to polishing, good stock removal, gives very smooth surfaces	6; 10; 12	10; 12; 15
X*	white	fine grinding to polishing, specially for the jewelry industry	10; 12	10; 12; 15
O	blue	intense grinding, medium rough	10; 12	10; 12

Further sizes and qualities on request. Ordering example: Shape K, Quality X, Size 10 mm = KX10
* Suitable for grinding zirconia jewelry

Walnut shell granulate

This granulate is impregnated with a polishing paste so that no further polishing paste need be added for the first 3-4 batches. Typical applications: mirror-finish polishing of precious metals, jewelry, titanium and steel alloys.

Type	Grain size	Properties / surface
H 1/20	4,0 - 8,0 mm	very smooth surface
H 1/30	4,0 - 6,0 mm	very smooth surface
H 1/50	2,4 - 4,0 mm	very smooth surface
H 1/100	1,7 - 2,4 mm	very smooth surface
H 1/200	1,3 - 1,7 mm	very smooth surface
H 1/300	0,8 - 1,3 mm	very smooth surface
H 1/400	0,4 - 0,8 mm	very smooth surface
H 1/500	0,2 - 0,4 mm	very smooth surface

Compounds

Compounds are added to the disc finishing machines during the grinding process in order to produce clean, bright and non-corroded workpiece surfaces. With impact-sensitive workpieces, the compound creates a foam buffer between the workpieces and the abrasive media.

Type	Application	Description	pH value	Dosage
SC 3	wet polishing	for soft alloys, brightening, suitable as additive for stainless steel and zirconia balls	4,5	1-5 %
SC 4*	universal, for wet grinding and wet polishing	intense foaming, for all non-ferrous metals, suitable for magnetic polishers	3	1-5 %
SC 5*	fine grinding, wet polishing	intense foaming**, brightening, for all precious and non-ferrous metals	6	3-5 %
SC 13	wet grinding, wet polishing	universal compound for all ferrous and non-ferrous metals, with anti-corrosive	8	1-5 %
SC 21	especially suitable for ultrafiltration units	universal compound with very good foaming properties, brightening, for all metals	7,5	1-5 %
SC 25	wet grinding, wet polishing	for non-ferrous metals (especially aluminum), brightening	5	1-5 %

* available in various concentrations

** specially for the jewelry industry

Wood polishing chips

Depending on whether grinding or polishing paste is added, wood polishing chips are suitable both for fine grinding and for polishing plastic, wood and horn.

Type	Grain size	Application	Cube Size a mm	Pins Size a=b mm
Wood Cube	4 x 4 mm	fine grinding and polishing	4	
Wood Cube	6 x 6 mm	fine grinding and polishing	6	
Wood Pins	2 x 10 mm	fine grinding and polishing		6/8

Plastic polishing chips

These media are used for the dry polishing of jewelry. Their consistent geometry prevents any dust from forming, a key factor in this area. Used for: jewelry industry; especially suitable for finishing silver jewelry, highly suitable for hollow items, lobster clasps and curb chains.

Type / quality	Color	Grinding effect	Surface	L a Grain Size a
LFP 3	white	fine polishing	high shine	3,0 mm
DFP	white	fine polishing	high shine	10,4 - 0,8 mm

Ceramic abrasives

Ceramic-bonded abrasives with a high density and hard substrate are used mainly for the wet polishing of heavy silver parts.

Quality	Grinding effect	ZS a b Cylinder** (diagonal cut) Size a/b
P	polished	1/3, 2/2, 2/5, 3/5, 3/10, 4/10, 5/10, 7/15

** also available in straight cut

Stainless steel media

No material is removed during processing. The surface is merely smoothed and compacted.
Used for: polishing, mirror-finish polishing and pressure deburring of precious metals.

Type	Properties	Size
Balls	polishing, compacting	2,4; 3,2; 4,0 mm
Satellites	polishing, compacting	SAT 3/5 mm
Pins	rounded pins, very good polishing effect, Application: magnetic polishers	0,3 x 5,0 mm 0,4 x 7,0 mm

Spherical zirconia

No material is removed during processing. The surface is merely smoothed and compacted.

Type	Diameter
G-Zy	0,8 - 1,0 mm
G-Zy	1,2 - 1,4 mm
G-Zy	2,0 - 2,5 mm

Further sizes on request.

Electropolishing media

GL 20: Polishing compound for gold
PL 1: Polishing compound for silver

Type	Color	Grinding effect	Application	Balls Size a mm	Grain Size a=b mm
MFB 0.5	orange		polishing silver	0,5 mm	
MFB 0.5	brown		polishing gold and brass	0,5 mm	
LFP 3	white	fine polishing	polishing gold and silver		3,0 mm

RELIABLE SEPARATION

The FS flow separation series from OTEC is the ideal solution for the fast and reliable separation of workpieces and media. Previously this work could only be carried out in an expensive and time-consuming manual operation. Because of the different densities of the workpieces and the media, these can be separated by flowing water within a few minutes in a completely automated process.

FS 25

Flow separation
OTEC FS

* Not all process media are suitable for flow separation.

The new UNISEPA screening unit from OTEC is a universal system designed for separating vibratory grinding abrasives and workpieces. A range of settings such as flow regulation, vibration frequency and vibration amplitude make the UNISEPA suitable for virtually any screen separation task.

- Fast and easy screen change
- Controllable rate of separation
- Extremely cost-effective
- Mobile for greater flexibility

UNISEPA

Screen separator unit
UNISEPA