

PERFECT SURFACES WORLDWIDE



A WELCOME FROM THE TECHNOLOGY LEADER in mass finishing



Proverbial ingenuity, coupled with German efficiency and a love of perfection, are the best qualifications for developing successful ways of creating immaculate surfaces. Driven by these attributes of German engineering, OTEC, with its innovative technologies, has grown into the industry trendsetter in just a few years.

MARKETS



AUTOMOTIVE INDUSTRY



TOOLMAKING INDUSTRY



STAMPED, TURNED AND MILLED PARTS



AEROSPACE INDUSTRY



MEDICAL AND PHARMACEUTICAL
INDUSTRY



CERAMIC AND PLASTIC PARTS



JEWELLERY AND WATCHMAKING
INDUSTRY

CERAMIC AND PLASTIC PARTS



CERAMIC AND PLASTIC PARTS

Ready-for-sale surfaces for demanding materials

- Technical workpieces made of ceramic or plastic:
 - High hardness of ceramic materials
 - Wear resistance
 - Various demanding types of plastic
- Special feature of the OTEC process
 - Particularly extensive experience and know-how in mass finishing
 - E. g. special process for grinding and high-gloss polishing of zirconium oxide ceramics
 - For this application R_a -values up to $0.01 \mu\text{m}$
 - Surface polish ready for sale

MASS FINISHING MACHINES

for ceramic and plastic parts

DISC FINISHING MACHINES
DRAG FINISHING MACHINES
STREAM FINISHING MACHINES



CERAMIC AND PLASTIC PARTS

Processing of ceramic parts

- Surface processing of ceramic workpieces is one of the biggest technical challenges

- Due to their high hardness and wear resistance, they are the ideal material for demanding workpieces like e. g.
 - Scratch-resistant mobile phone keys
 - Medical implants
 - Jewellery and watches
 - Automotive trim parts
 - Yarn guides in the textile industry



CERAMIC AND PLASTIC PARTS

Technique

- Disc finishing machines (CF-process) for bulk work pieces
 - Medicine and dentistry (implants)
 - Decorative parts (e. g. jewellery and watches)
 - Thread guides (e. g. looms)
 - Technical ceramics
- Drag finishing plants (DF process) for the machining of sensitive parts
 - e. g. hip and knee joints
 - Tools made of ceramic but also carbide
- Stream finishing machines (SF-procedure) for processing of clamped workpieces



CERAMIC AND PLASTIC PARTS

Disc finishing machines

- Process description:
 - For grinding and polishing of ceramic workpieces
 - Abrasives with a high density and a slightly abrasive effect
 - Sufficient pressure during processing
- Disc finishing machine: grinding and polishing in one operation
 - Workpieces (plastic), are deburred smoothed or even highly polished (depending on the media) in a very short time.



CERAMIC AND PLASTIC PARTS

Rapid Prototyping – 3D printed work pieces

- Workpieces are built up layer by layer from materials which are available as fine powder (metal, plastic and composite material)
- Laser-sintering is often used in the following applications
 - Here, a powerful laser beam melts the powder exactly at the locations specified by the computer-generated component design data.
- The resulting workpieces have a rough surface due to the process (R_a 3-6 μm , R_z 15-45 μm)
- Due to technical and often also optical requirements, the surface should be smoothed or be polished after laser sintering.
- Due to the manufacturing process, a maximum surface quality of R_z 0.5 μm can be achieved.



CERAMIC AND PLASTIC PARTS

Rapid Prototyping – 3D printed work pieces

- Typical applications:
 - Implants
 - Dental prosthesis
 - Bridges
 - Watches
 - Ear implants for hearing aids

- Processing in OTEC mass finishing machines:
 - Due to the high initial roughness, pre-processing with ceramic abrasives is necessary → DBS grinding media with very strong abrasive effect.
 - Afterwards mostly reworking with KM plastic grinding media
 - Depending on the requirements, followed by a polishing process



THANK YOU FOR YOUR ATTENTION.