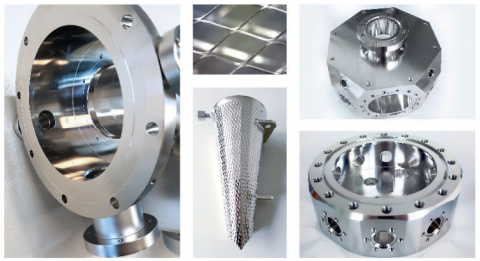
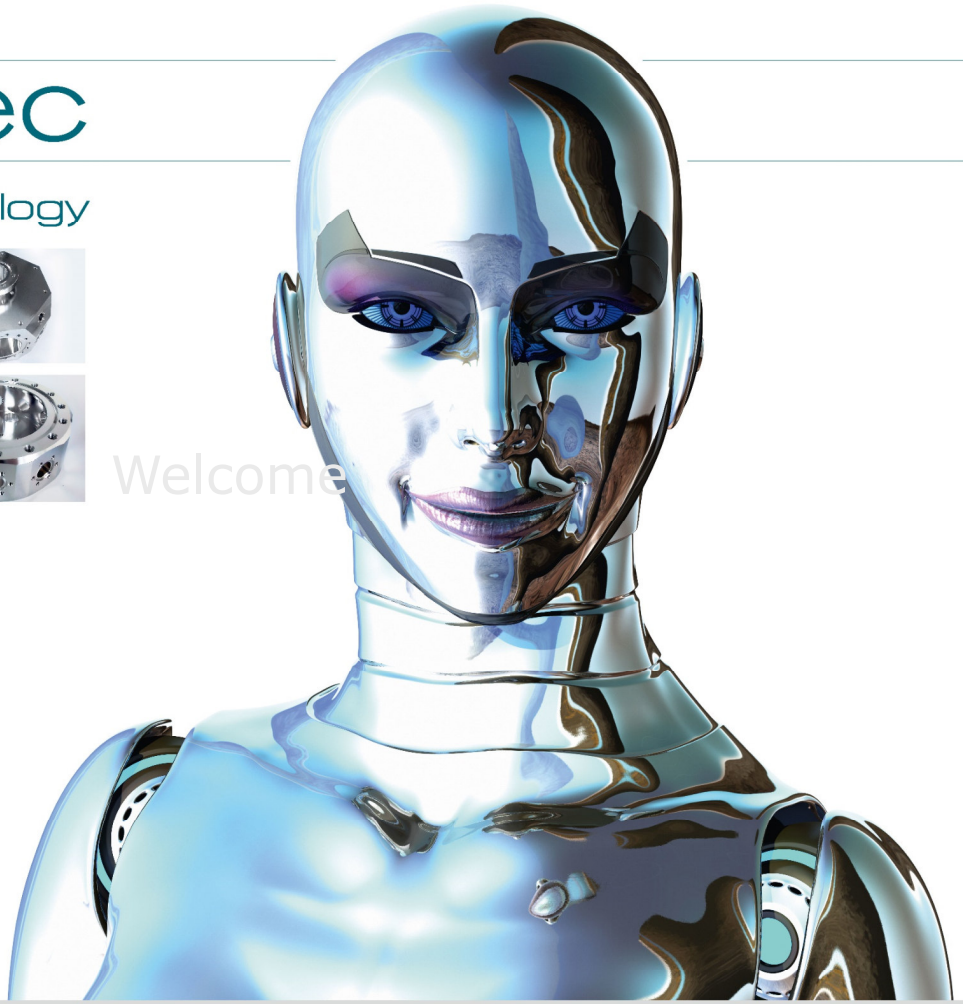
Welcome

plasotec

surface technology





polishing ▪ deburring ▪ cleaning ▪ polishing ▪ deburring ▪ cleaning ▪ polishing ▪ deburring ▪ cleaning ▪ polishing ▪ deburring ▪ cleaning

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Our range of services includes the

deburring

cleaning

polishing

with plasma polishing process

The main features of the plasma polishing process

electrolytic machining process for electrically conductive materials

- Stainless steels
- CoCr, CoCrMo
- Nickel- Nickel alloys
- Titan, Titan alloys
- Copper, Brass, Bronze
- Aluminium is currently under development
-

The main features of the plasma polishing process

- anodic polarised metallic workpiece is moved into an electrolytic bath
- bath voltage approx. 320 V DC
- Current input approx. 0.15 A / cm²

The main features of the plasma polishing process

- repetitive gas discharges lead to process-related plasma development on the entire workpiece

The main features of the plasma polishing process

<u>during plasma polishing:</u>

- minimal material removal
- reduction of roughness (by up to a factor of 10-15)
- removal of all organic and inorganic impurities

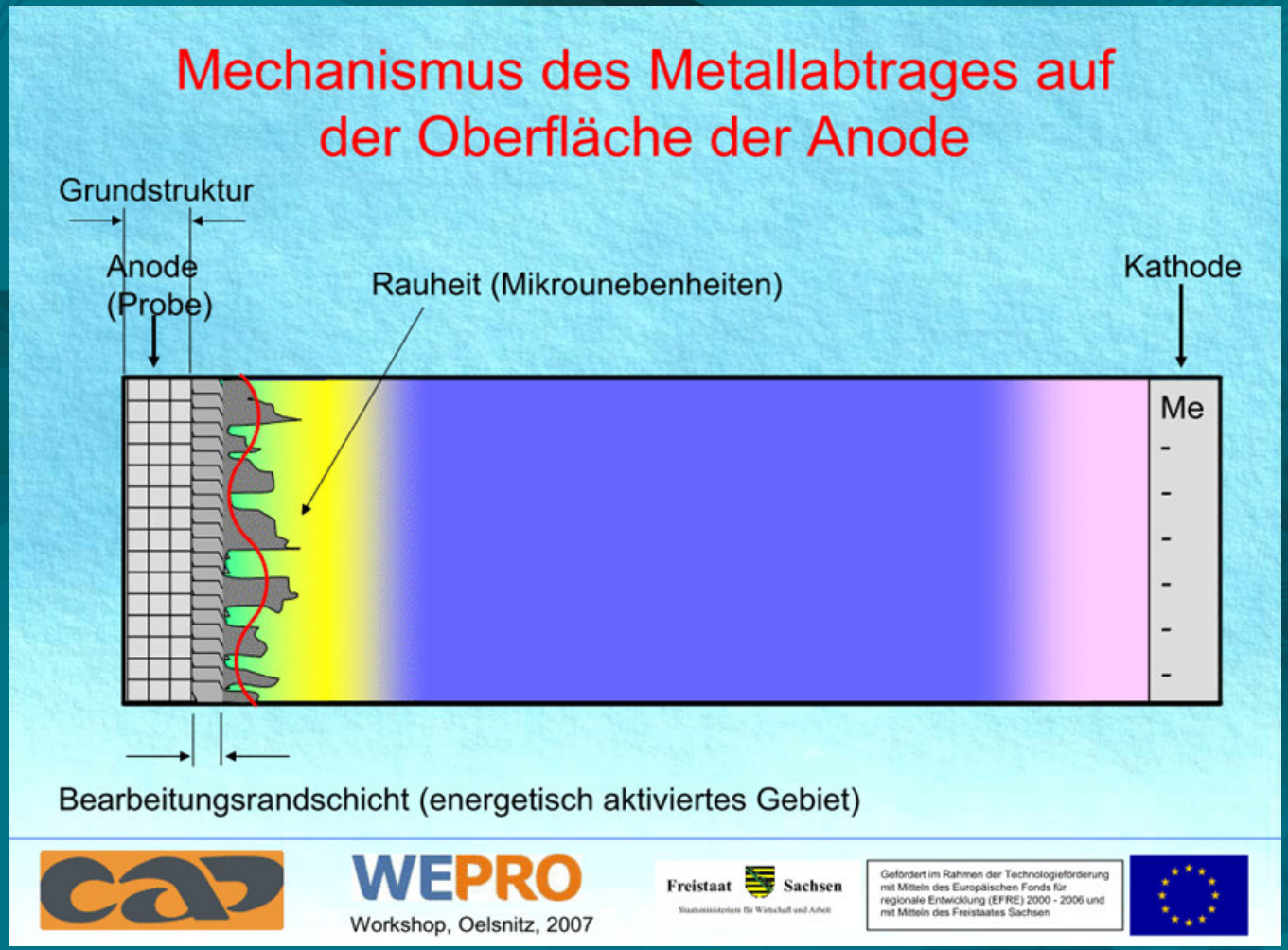
The main features of the plasma polishing process

no use of highly concentrated acids as electrolytes

electrolyte consists of approx. 95% water and 5% salt

→ environmentally friendly machining process to improve surface quality

The mechanism of metal removal during plasma polishing

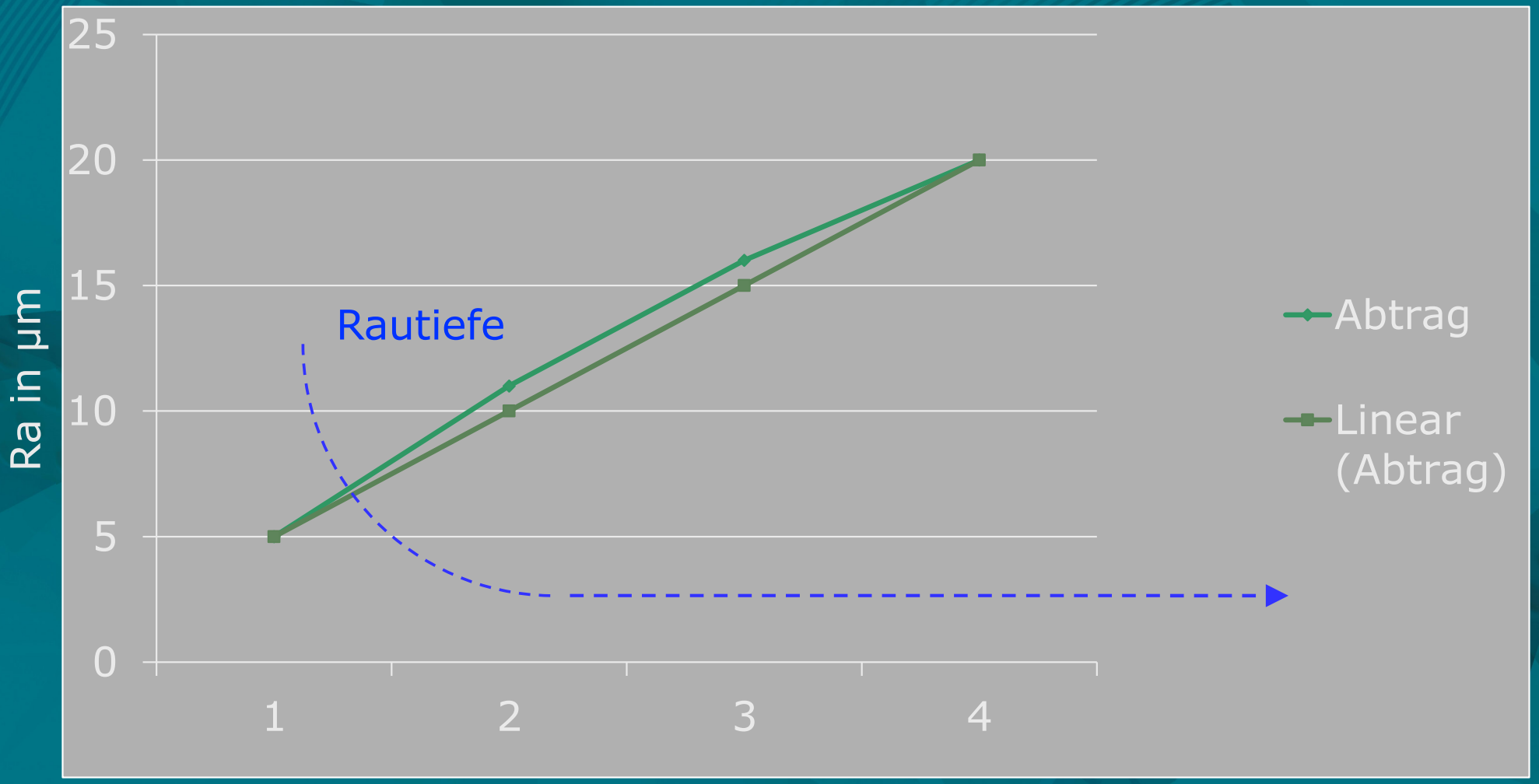


Quelle: Beckmann Institut

The microstructures are processed, and the macro-structures are largely preserved

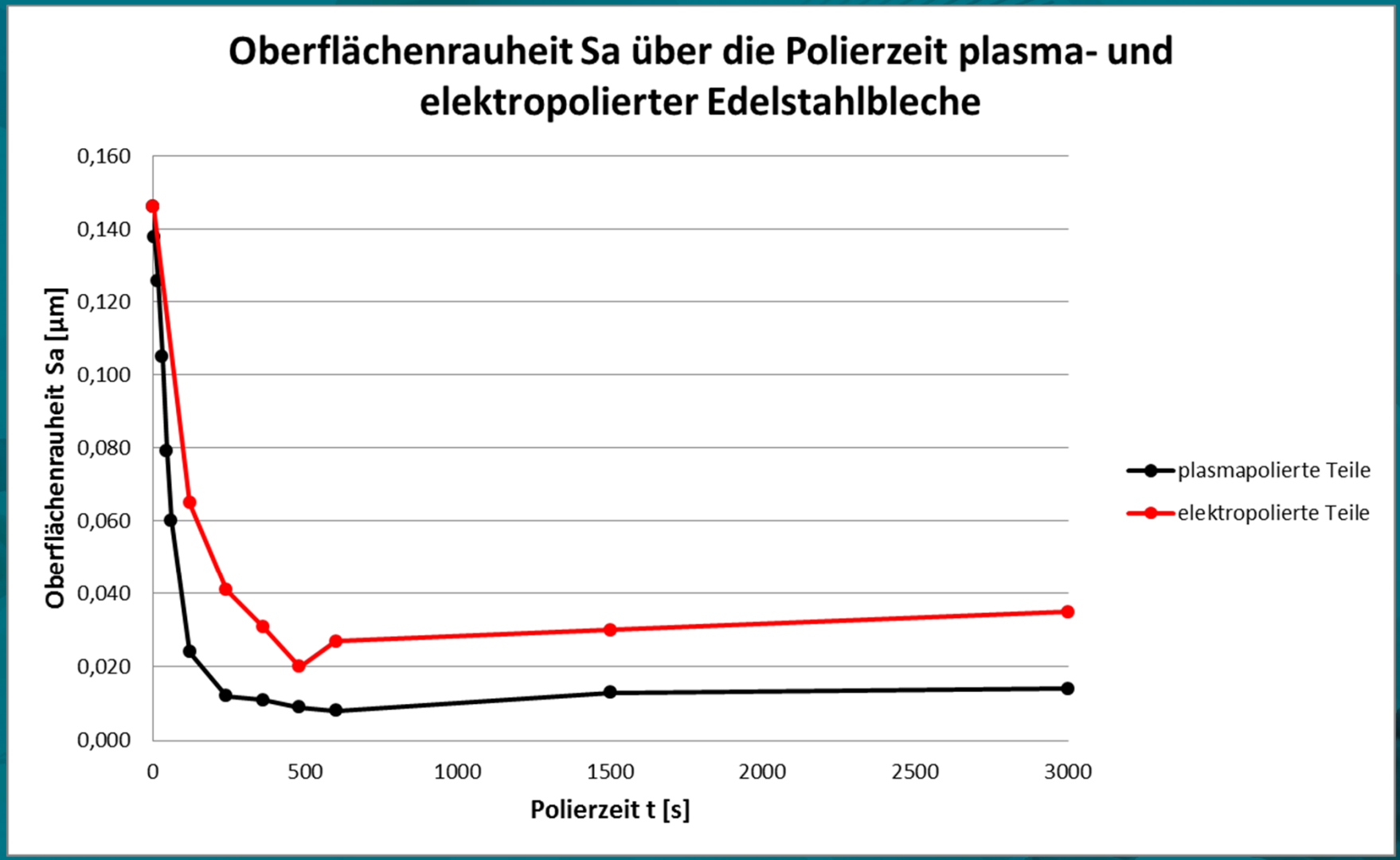
Roughness roughness vs. material removal

Diagramm: Abtrag / Zeit bzw. Rautiefe / Zeit



Quelle: plasotec GmbH / Rautiefe vs. Abtrag /1.4301

Roughness vs. Time



Quelle: Uni Rostock Rautiefe EP vs. EPP / 1.4301

Contact angle measurement

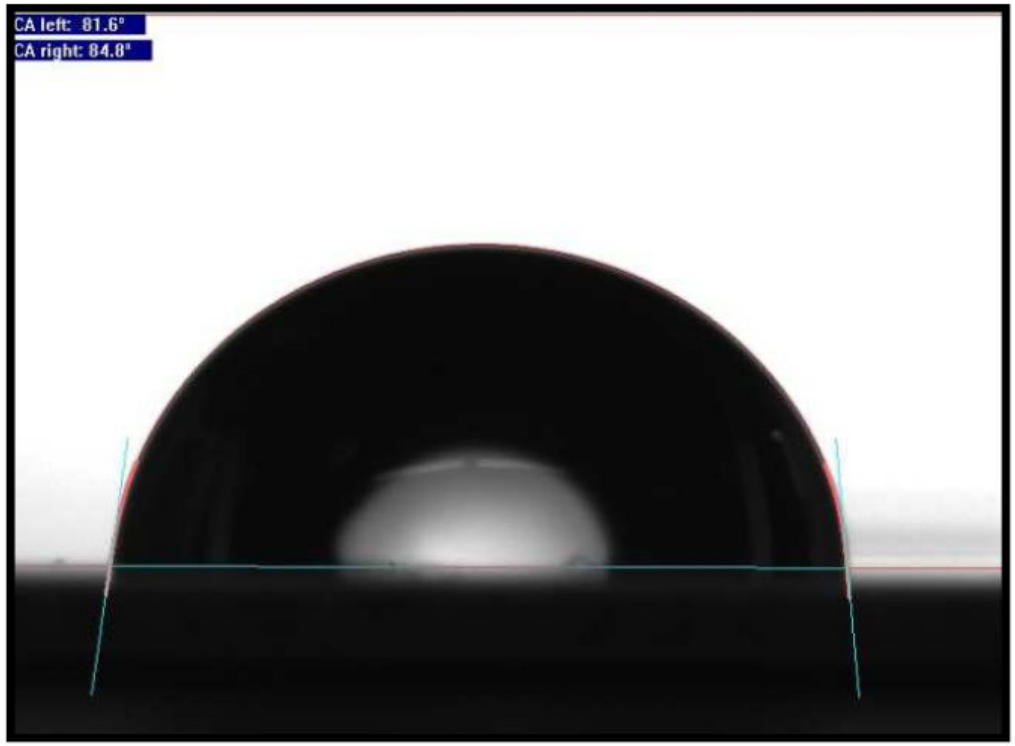


Abbildung 1 Kontaktwinkelmessung einer polierten Oberfläche (Tropfenbreite ca. 3mm)

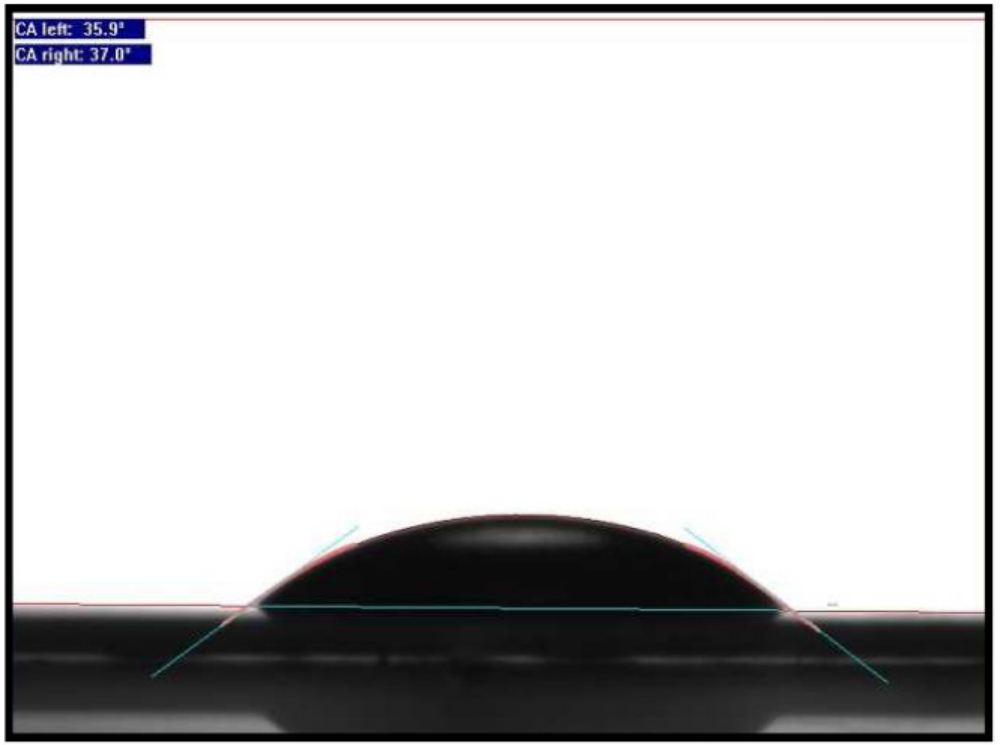


Abbildung 2 Kontaktwinkelmessung einer unpolierten Oberfläche (Tropfenbreite ca. 6mm)

Abb.: Kontaktwinkel: Quelle Universität Rostock

Corrosion behaviour

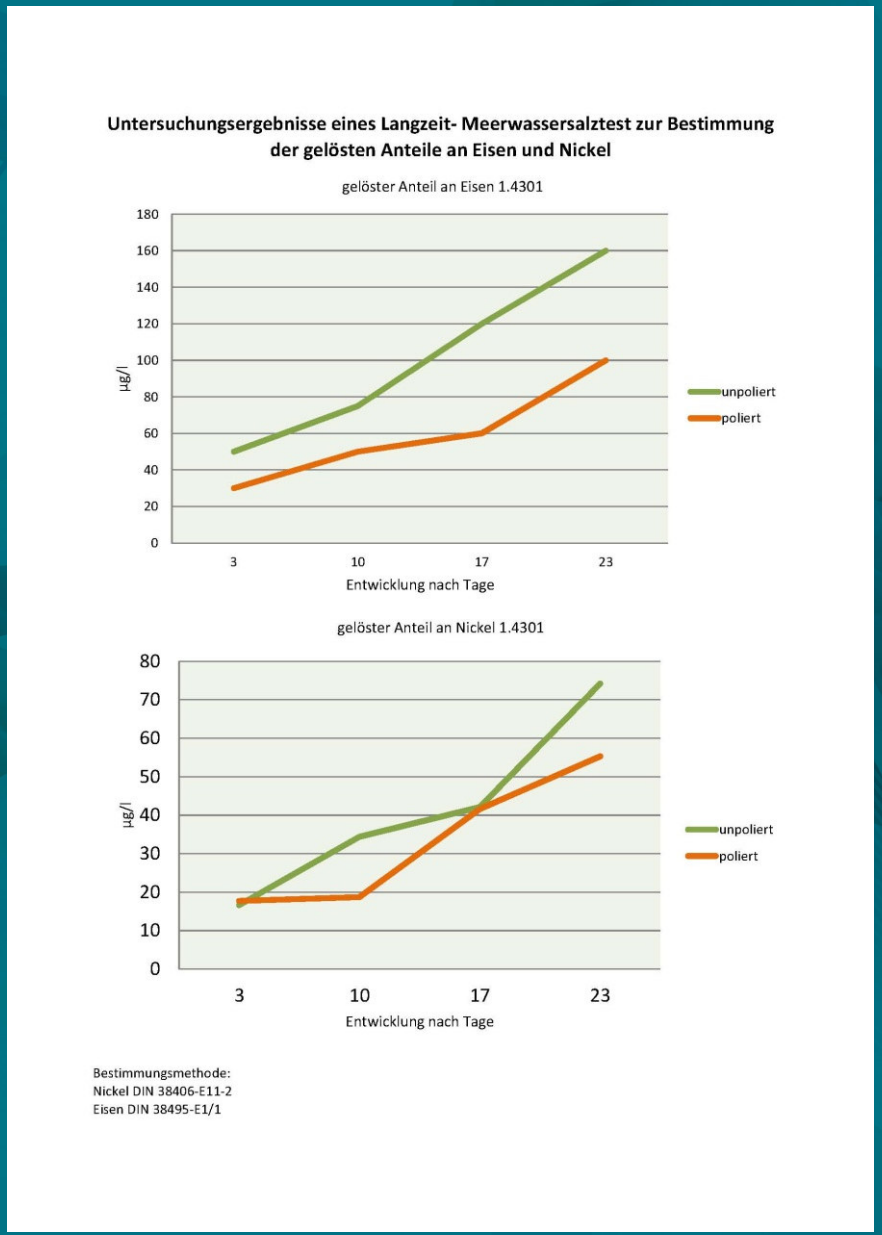


Abb.: Korrosionstest 1.4301

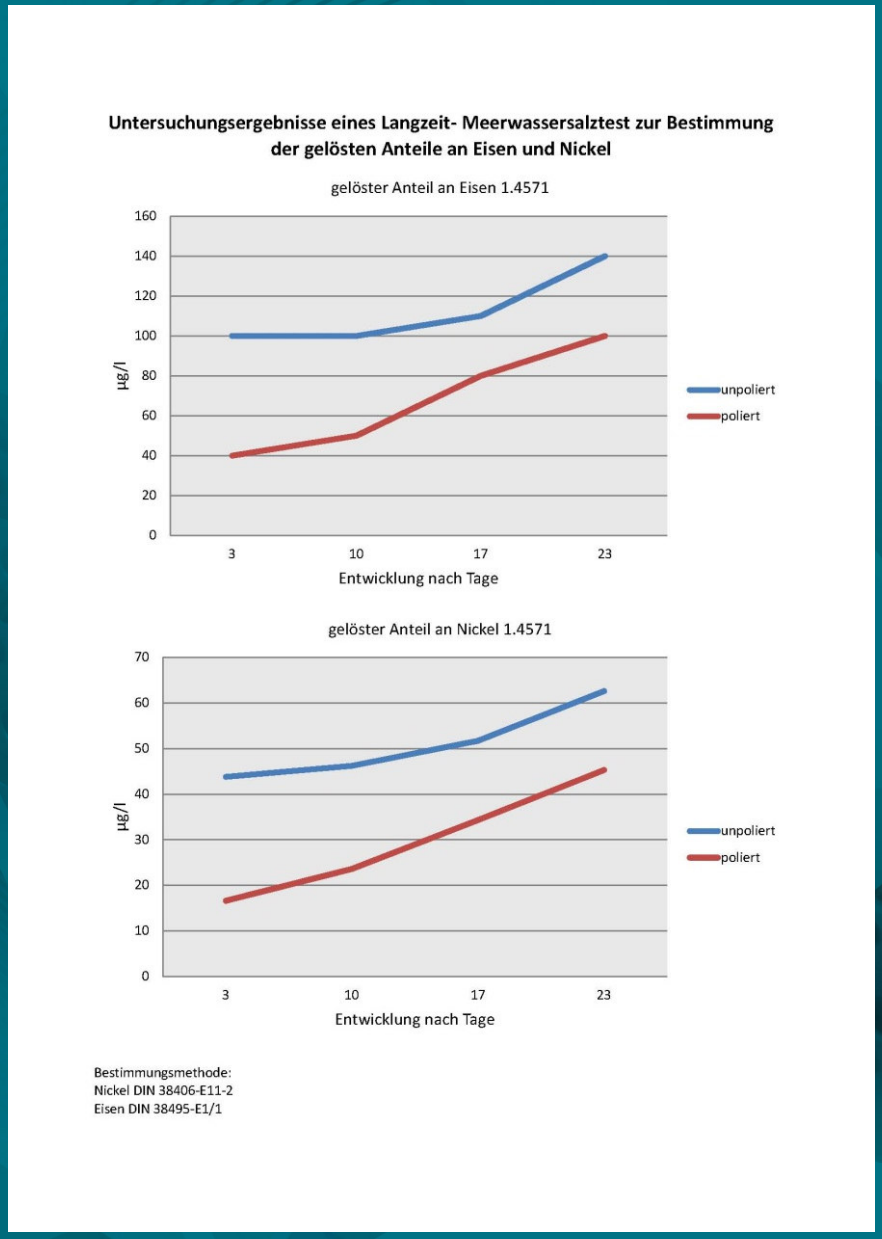


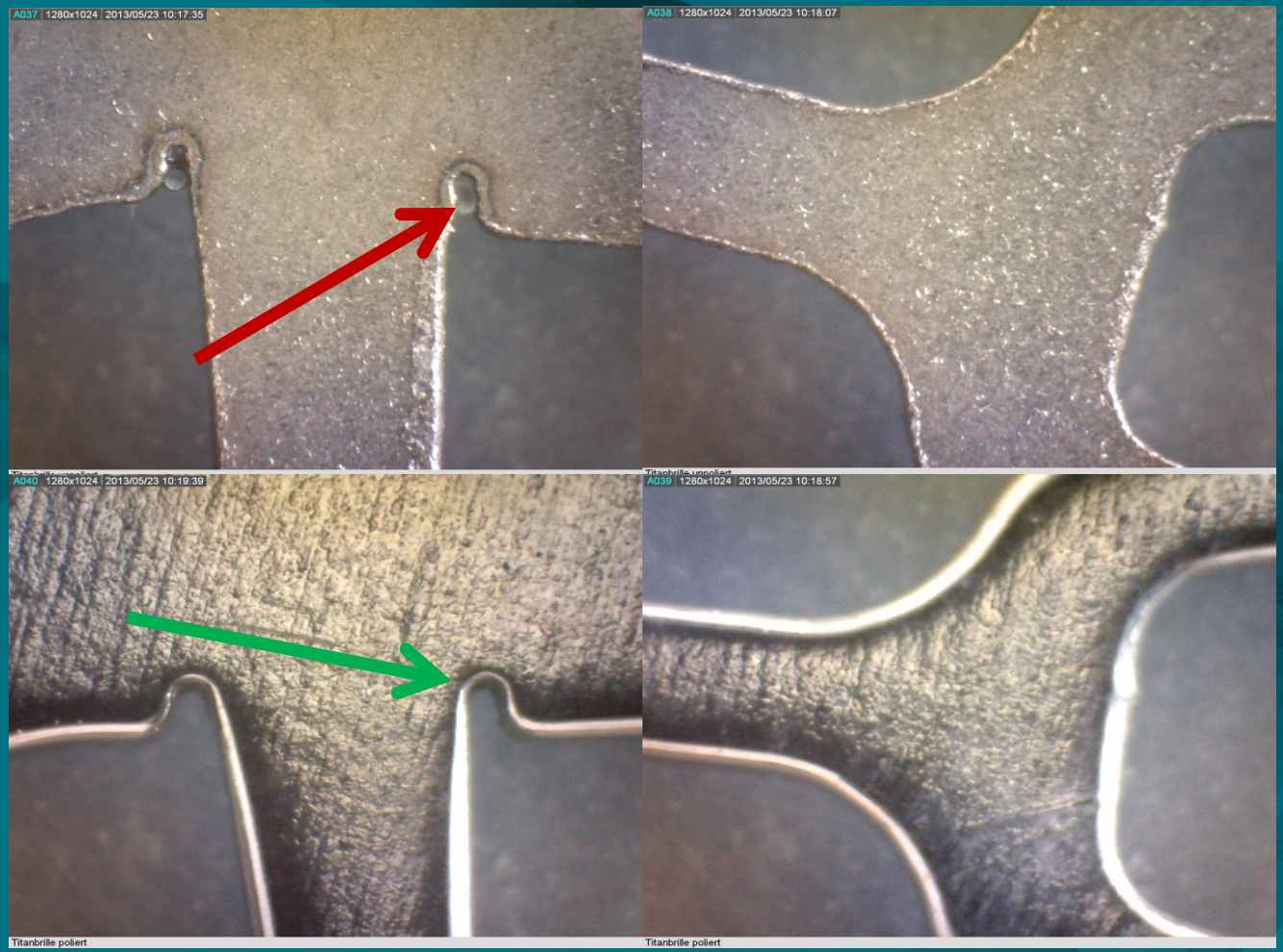
Abb.: Korrosionstest 1.4571

Plasma polishing plant

Quelle: plasotec GmbH / Plasmapolieranlage

Application examples machining program

Titanium glasses:
Processing target: Deburr, cleaning



Quelle: plasotec GmbH / Titanbrille

Surface before plasma polishing process

-> sharp cut edges
-> tarnish colours
-> no shine

Surface after plasma polishing process

-> deburred cut edges
-> tarnish paints eliminated
-> higher gloss burr

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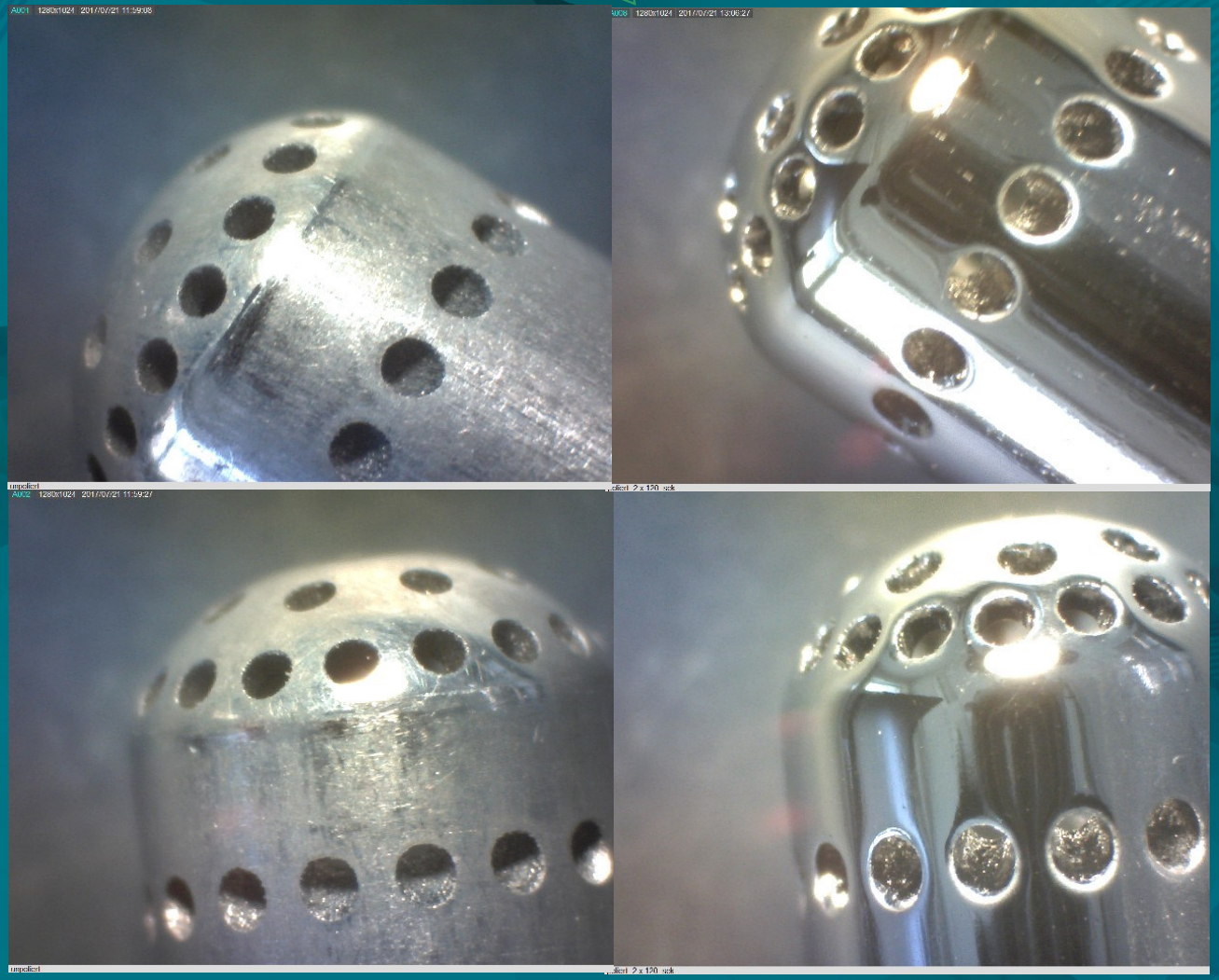
Application examples from machining program

Filling nozzles Ø 3 mm -1.4404:
Processing target: Deburring with high contour fidelity



Surface before plasma polishing process

-> strong ridge on hole edges
-> coarse base material
-> no shine

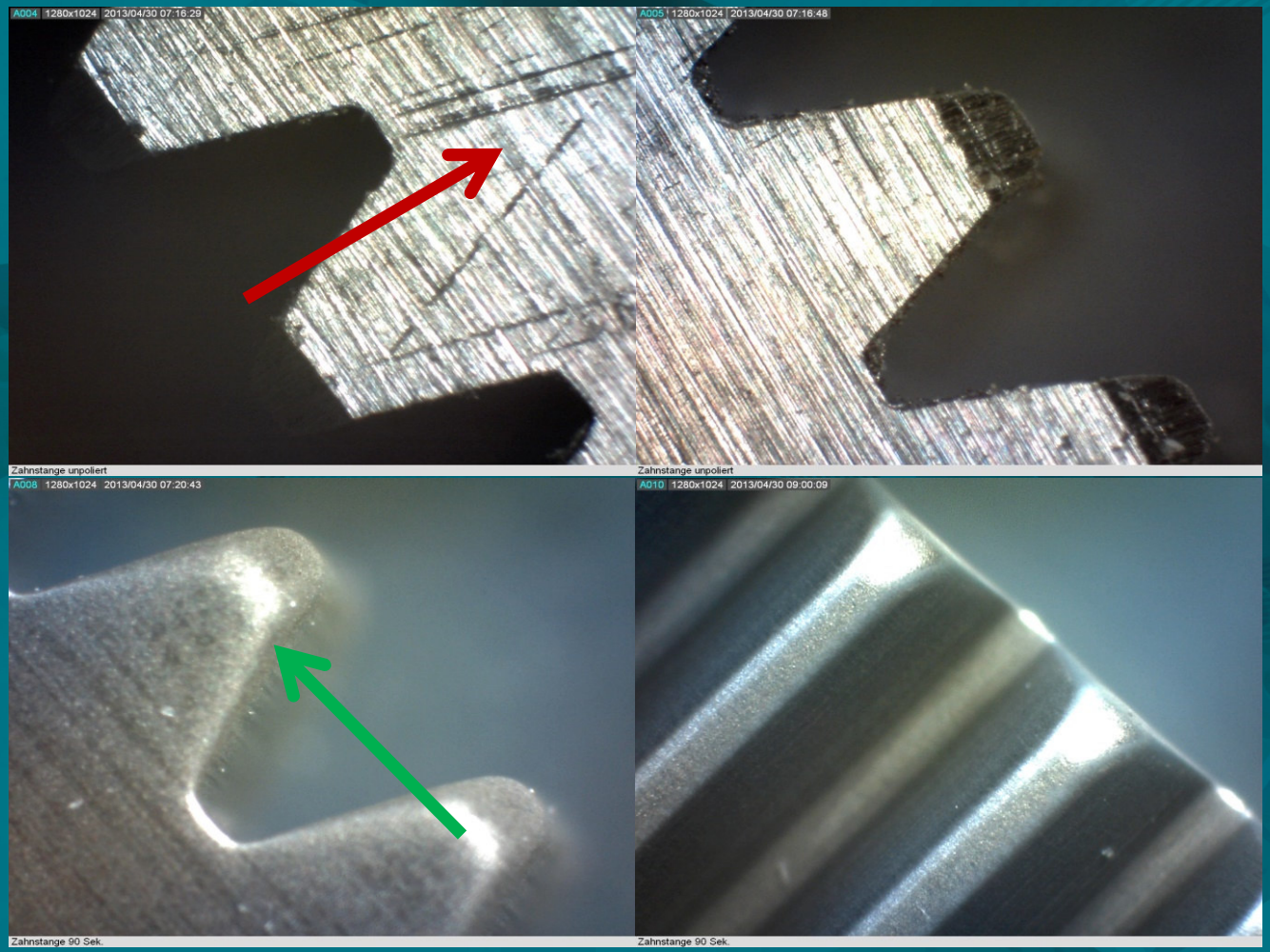
Surface after plasma polishing process

-> ridge away
-> basic material ok
-> smooth homogeneous surface

Quelle: plasotec GmbH Düse

Application examples machining program

Rack and gear wheels
Processing target: Deburring, preparation for coating processes



Surface before plasma polishing process

-> sharp cut edges
-> coarse milling marks
-> metal particles

Surface after plasma polishing process

-> deburred cut edges
-> milling traces eliminated
-> no metal particles
-> ideal for further coating processes

Quelle: plasotec GmbH / Zahnstange

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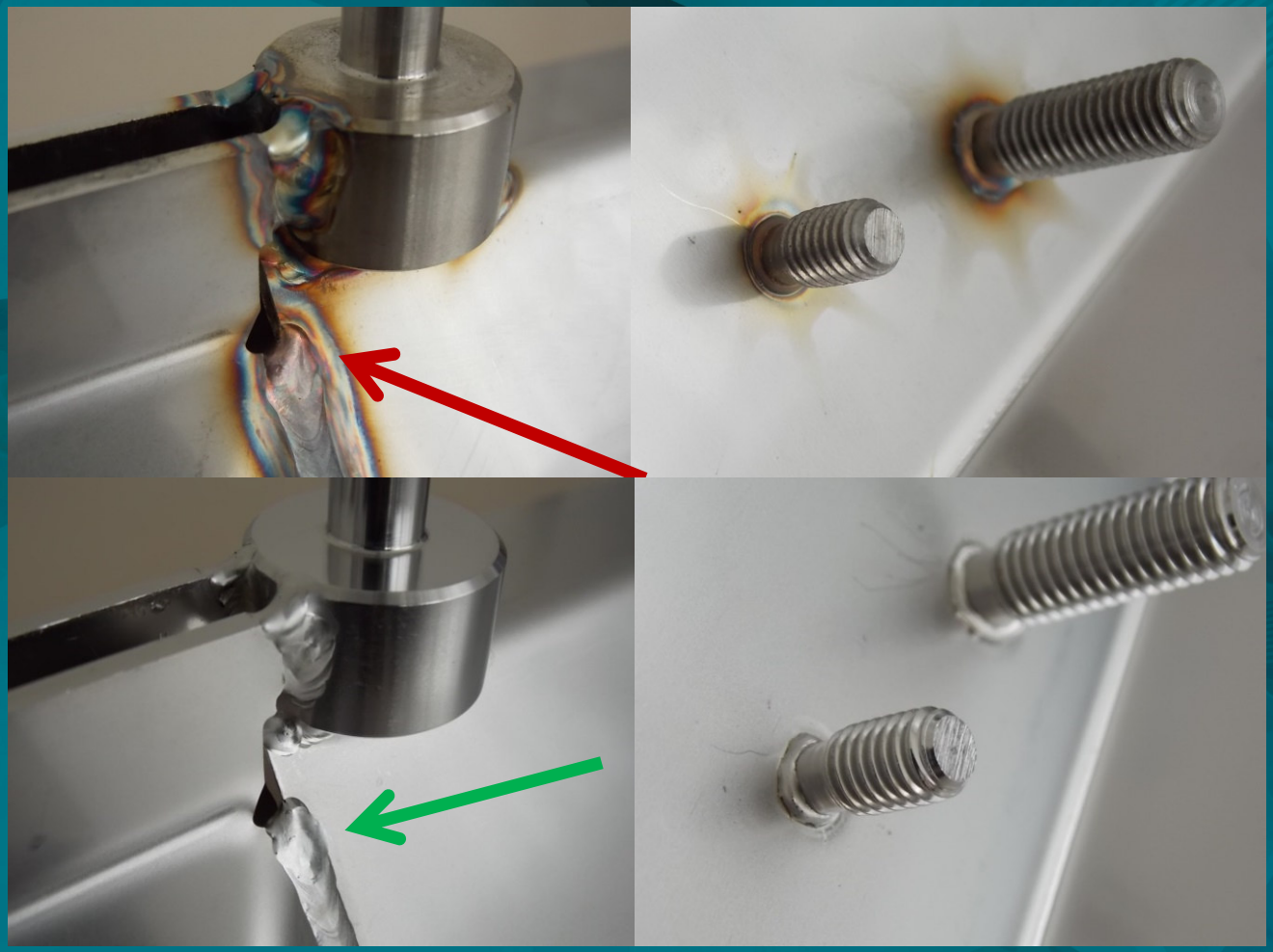
Application examples machining program

Welded assembly:
Processing target: Welding cleaning, surface polishing



Surface before plasma polishing process

-> strong tarnish colors
-> impurities of Pre-litigation

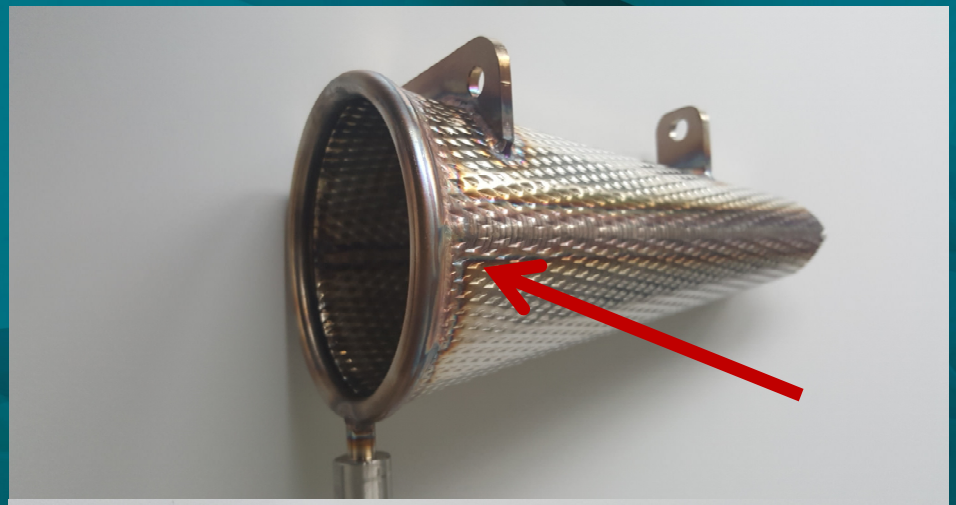
Surface after plasma polishing process

-> welds cleaned
-> removed tarnish colors
-> surface polished

Quelle: plasotec GmbH / Schweißbaugruppe

Application examples machining program

Welded assembly:
Processing target: Welding cleaning, surface polishing



Surface before plasma polishing process

-> strong tarnish colors
-> impurities of Pre-litigation

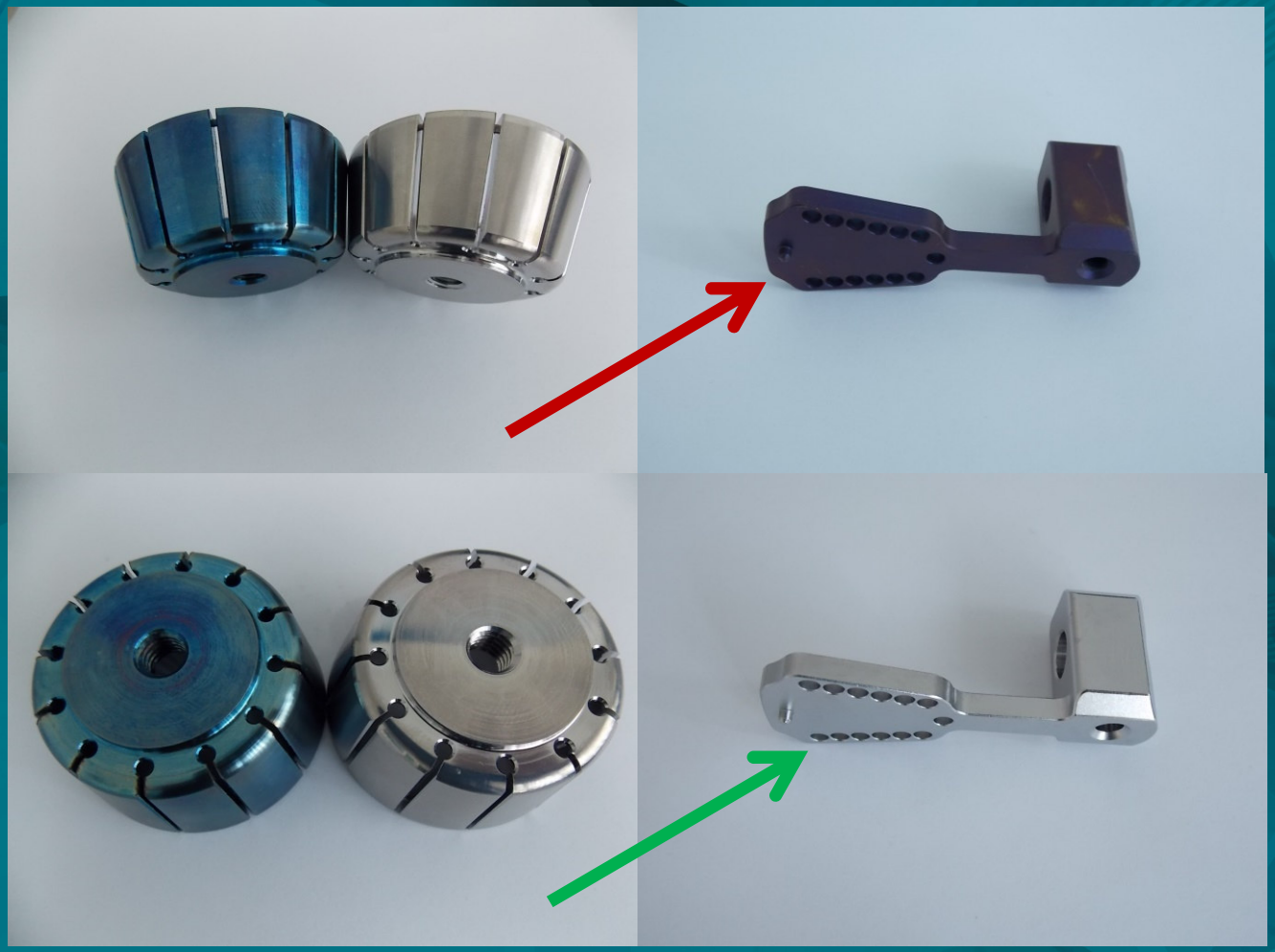
Surface after plasma polishing process

-> welds cleaned
-> removed tarnish colors
-> surface poleiert

Quelle: plasotec GmbH / Schweißbaugruppe

Application examples machining program

Hardened turned and milled parts:
Processing objective: Cleaning, surface polishing



Surface before plasma polishing process

-> strong tarnish colors
-> impurities of Pre-litigation

Surface after plasma polishing process

-> welds cleaned
-> removed tarnish colors
-> surface polished

Quelle: plasotec GmbH / Mechanik- Baugruppen

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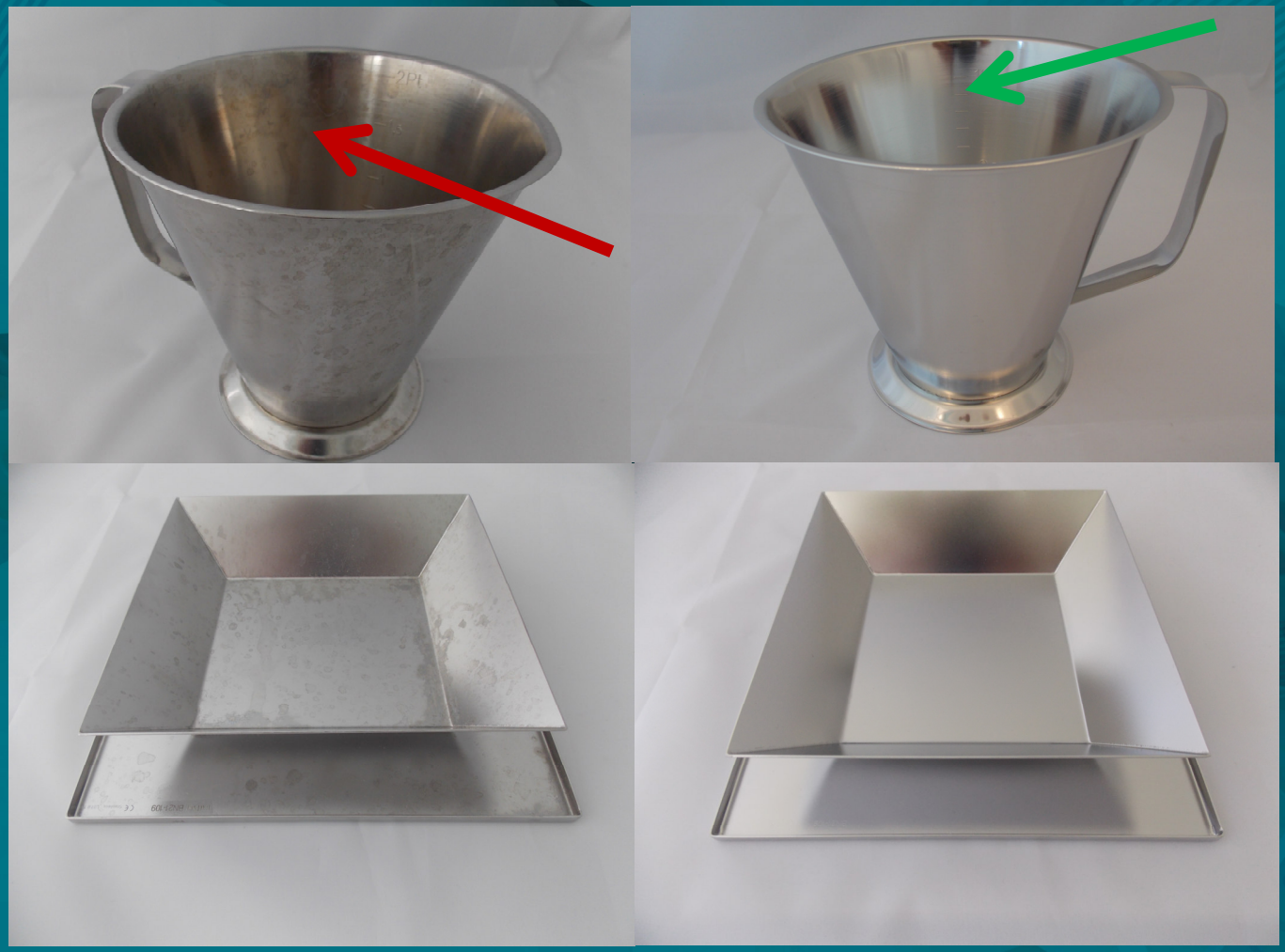
Application examples machining program

Cleaning of surgical accessories / processing target: Residue-free cleaning of contamination by multiple sterilization



Quelle: plasotec GmbH Gehirnwatteschale / Blutkanne

Surface before plasma polishing process

-> discoloration of the surface due to long exposure time of strongly alkaline cleaners
-> water stains
-> no glossy ridge

Surface after plasma polishing process

-> no brown discoloration
-> no water stains
-> clean beautiful surface
-> length of resistance to new contamination

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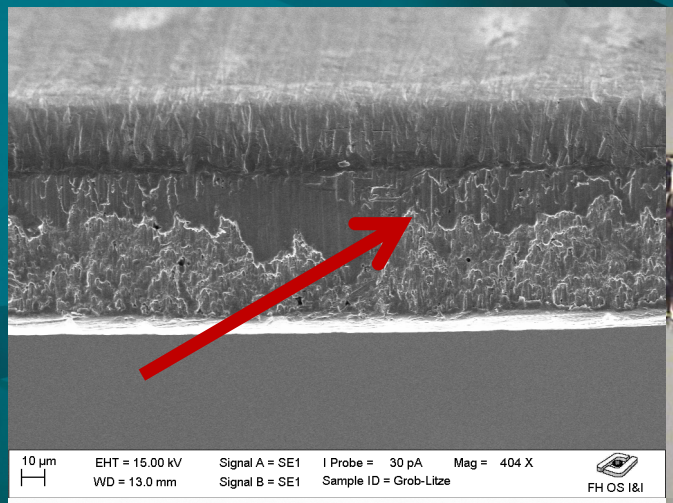
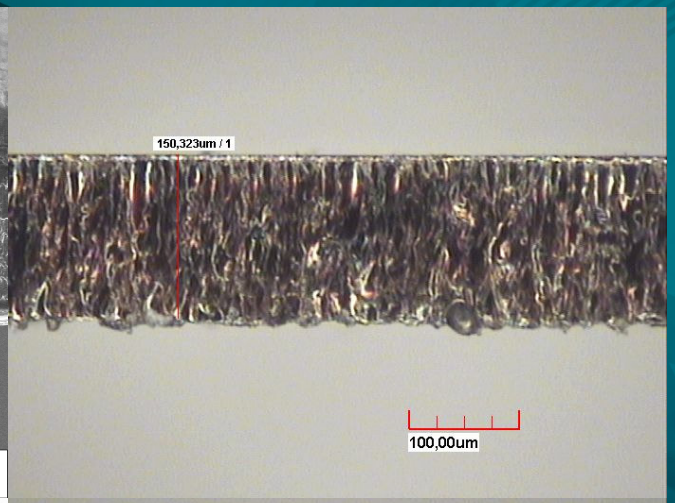
Application examples machining program

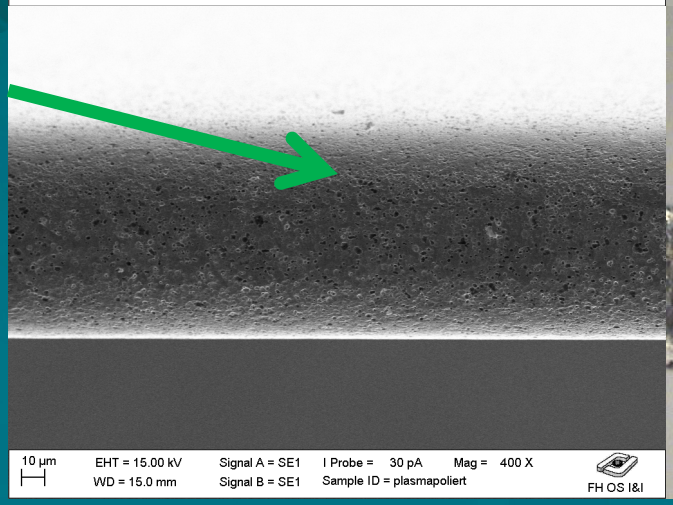
SMD screen printing film:
Processing target: Laser pads deburr at min. edge rounding

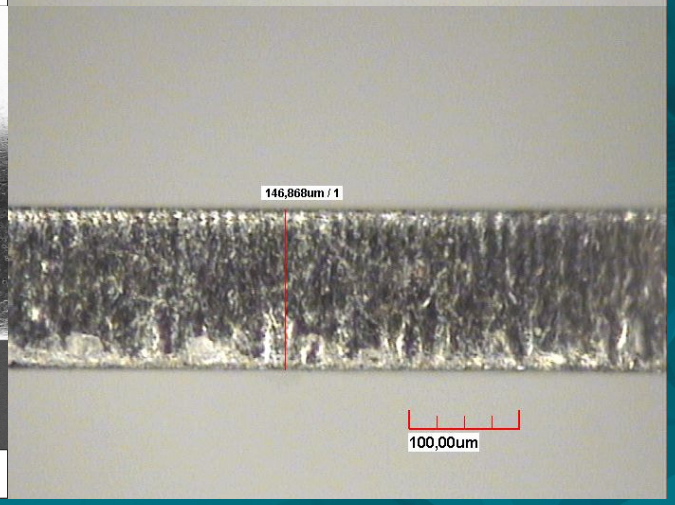




Surface before plasma polishing process

-> coarse laser structures
-> strong tarnish colors





Surface after plasma polishing process

-> deburring of the laser pads
-> maintaining a strong edge structure
-> tarnish paints eliminated

Quelle: plasotec GmbH SMD Siebdruckfolie

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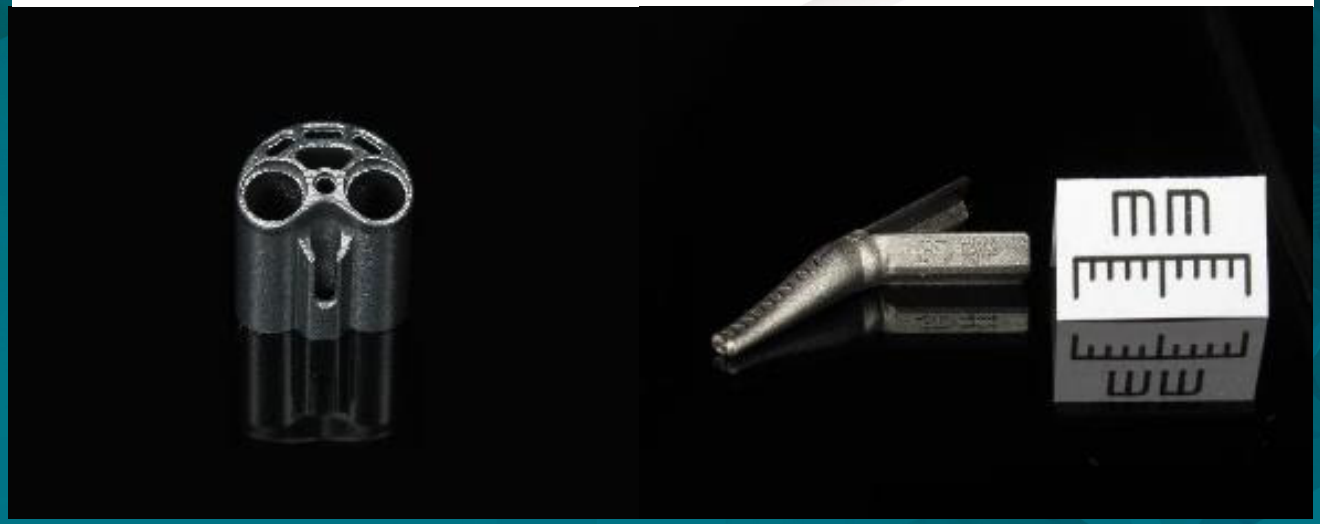
Application examples from machining program

Medical technology: dosing systems and tools from medical technology,
Material 1.4404
Processing target: maximum fineness / deburring



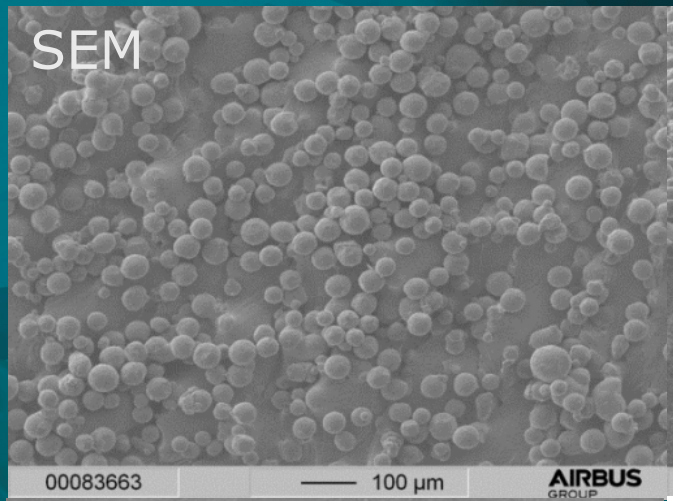
Surface unprocessed
average
measurement
results
Ra= 2.5 µm
Rz= 15 µm

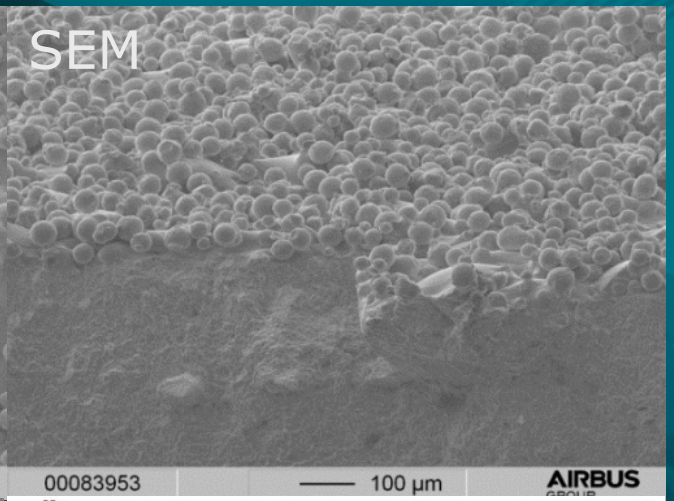
Surface Plasma
Polished
Processing time 120
seconds
average measurement
results
Ra= 1.5-1.0 µm
Rz= 6 – 4 µm
Improvement Rz 67%
Improvement Ra 50%

Quelle: 3D MicroPrint GmbH

Application examples machining program

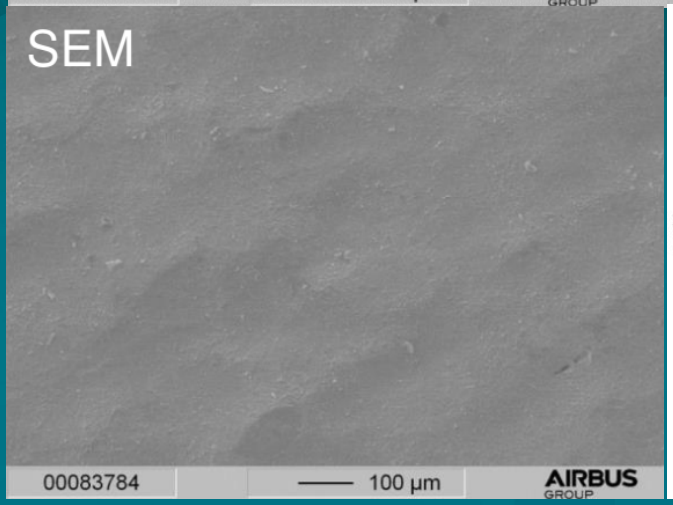
Surface ALM manufactured (photos with SEM / REM)
Processing target: maximum fineness

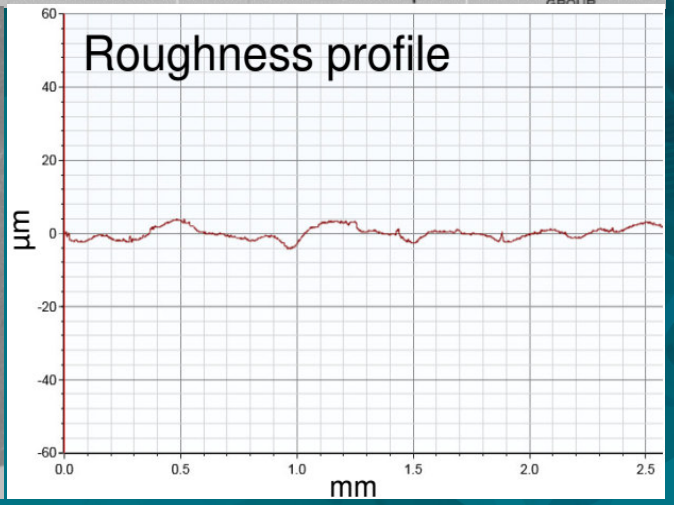




Surface before plasma polishing process

-> Ra:ca. 20 µm





Surface after plasma polishing process

-> Ra: ca.1,4 µm

Quelle: Airbus ALM gefertigte Oberfläche

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Interesting views

Quelle: plasotec GmbH / Kurzfilm Plasmapolieren

Innovation and added value

- very high geometry fidelity
- Material remove as function of time
- very short cycle times
- no pre-treatment
- short cleaning processes
- improved corrosion properties
- Environmentally friendly electrolyte technology

Let's start the conversation

We are happy to process your sample parts and we will help you to solve your surface problems.

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Tobias Weise from plasotec team