

# LASER ABLATION (SELECTIVE ABLATION)

contact person  
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## FEATURES OF PERFORMANCE

- intact surfaces (color and structural changes) or extreme deep ablation of several millimeters
- edge leaning: > 11° optional adjustable (depends on material); ≤ 11° possible (depends on material and process effort)
- heat effected zone depends on material and process effort
- minimal layer ablation in sub-micrometer range
- typical finish qualities (Ra):
  - > ablated: 1.5 µm silicon; 3.0 µm stainless steel; 7 µm Al<sub>2</sub>O<sub>3</sub>
  - > polished: 1.0 µm silicon; 0.6 µm stainless steel; 4 µm Al<sub>2</sub>O<sub>3</sub>

## POSSIBILITIES OF PROCESSING

- typical subject sizes: < 100 x 100 mm<sup>2</sup>, max. 180 x 180 mm<sup>2</sup>
- assembling of motifs possible, depends on application
- rotational axis processing possible
  - > internal diameter from 1.0 mm and external diameter to 120 mm clampable
  - > circumferential deep engraving possible
- height of components up to 60 cm, depends on application
- typical spot size for laser ablation approx. 60 µm, depends on application
- available laser sources:
  - > nano second laser 1064 nm
  - > pico second laser 1070 nm

## TOLERANCES

- positioning tolerance of motif: ± 100 µm, ± 50 µm on request
- by measuring of components and structures better positioning tolerances as well as an aligned double-sided processing is possible
- contour fidelity: better than 20 µm (depends on scanner and size)
- general tolerances: ± 50 µm, higher accuracy on request
- extreme high repeatability

## TYPICAL APPLICATIONS

- generating defined surface patterns for special mold or adhesive and frictional properties
  - > patterning of quenched and tempered functional surfaces on die casting tools
  - > modification of optical surfaces
  - > functional surfaces on clamping claws
- generating micro structures in hardly etchable or machinable materials
  - > cavities in ceramic substrates for bare dices
  - > canal system for microfluidic applications (reactors)
  - > pre-structuring of silicon for step coating
- purification/ polishing of mechanically sensitive surfaces (removing of adhesives and other residuals)
- patterning of coated components (decoating)
  - > electrical separation of layers on completely with gold sputter-coated ceramic hollow cylinders
  - > electrical and mechanical isolation of electrolytic or galvanic applied copper layers on ceramic or polymers
  - > selective ablation of sealing and protective layers on circuit carriers
  - > trimming of track resistances
- grinding or polishing of barely machinable materials
- smoothening of milling grooves or eroded patterns
- deep structuring of metals (fine contours)