

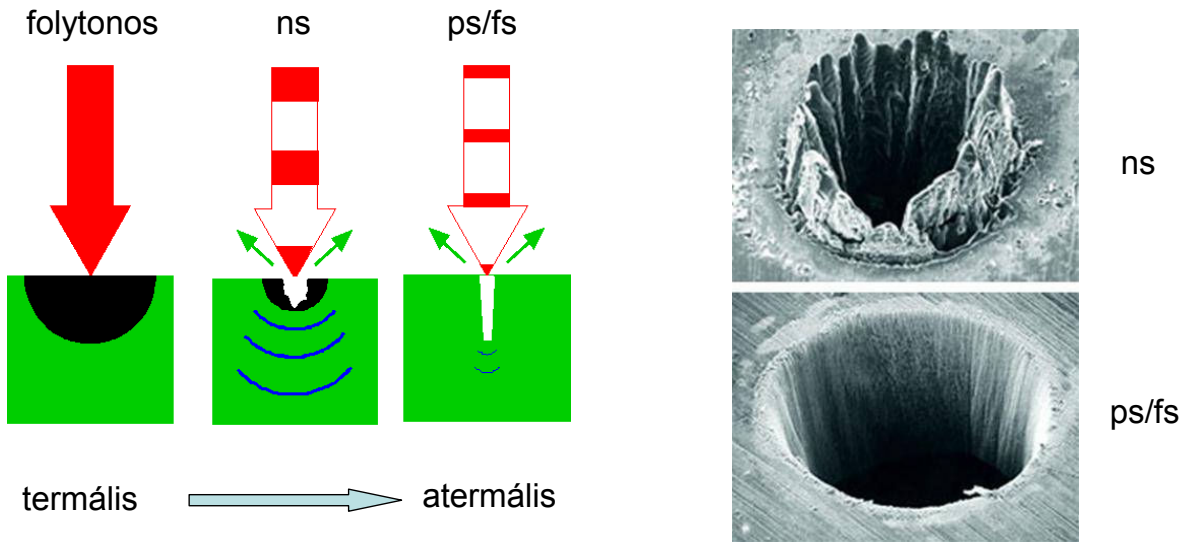
A lézeres anyagmegmunkálás

2010. december 8.

A lézeres anyagmegmunkálás fajtái

- Szerkezeti változás (*structural change*)
- Felületkeményítés (*hardening*)
- Deformáció és törés (*deformation and fracture*)
- Felszíni olvasztás (*surface melting*)
- Bevonatolás (*cladding*)
- Keveréses kötés (*conduction joining*)
- Vágás (*cutting*)
- Jelölés (*marking*)
- Hegesztés (*keyhole welding*)
- Atermális megmunkálás (*athermal processing*)

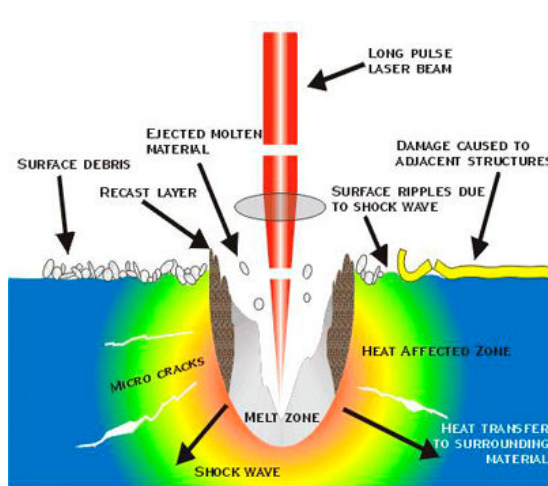
Mikromegmunkálás



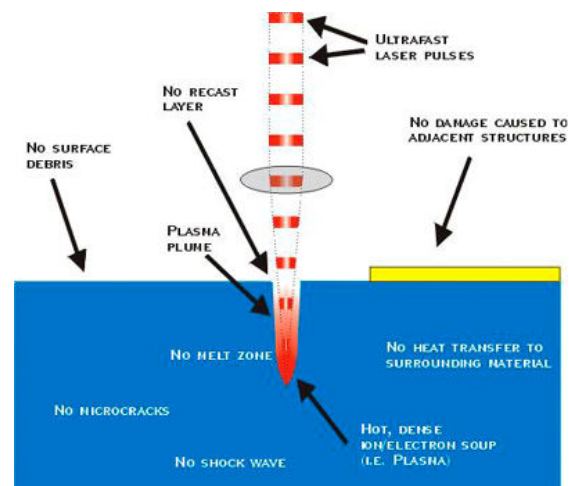
www.imra.com/tech-licensing.asp

<http://www.imperial.ac.uk/research/photonics/research/topics/ablate/index.htm>

ns kontra fs megmunkálás



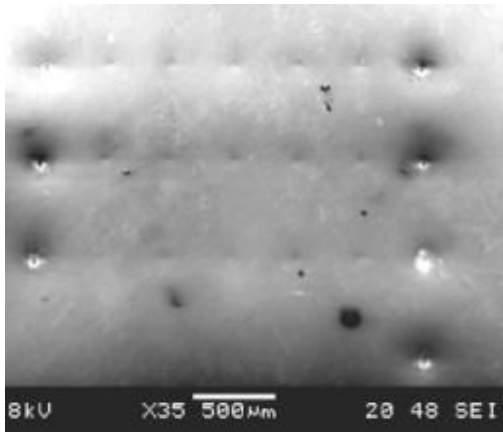
nanoszekundumos impulzus



pico- és femtoszekundumos impulzus

http://www.cmxr.com/#mmhandbook_3
http://www.cmxr.com/#mmhandbook_5

Megmunkálás lökéshullámokkal



SEM micrograph of dents produced by LSP on aluminum sample (3 laser pulses at each location with pulse energy $E = 240 \mu\text{J}$, laser pulse duration = 50 ns, pulse repetition rate = 1 KHz, beam diameter = 12 microns, laser wavelength = 355 nm)

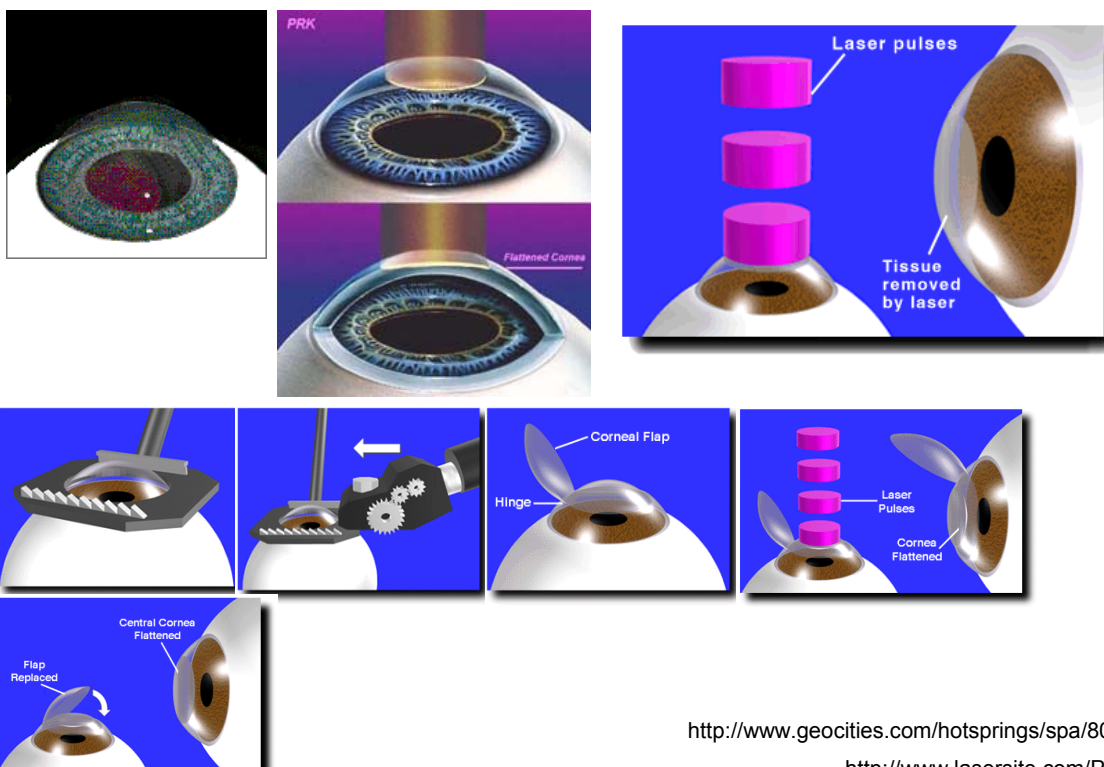


The Air Force ManTech Program, working with General Electric Aircraft Engines and LSP Technologies, Inc., developed an emerging technology, called laser shock peening, as a potential solution to increase the durability of titanium fan blades and decrease the sensitivity to foreign object damage. **Laser shock peening uses a high-energy laser pulse to impart an intense shock wave into the surface of metal parts. The shock wave creates deep compressive residual stresses which greatly improve fatigue properties and toughness.**

<http://www.mrl.columbia.edu/photogallery/photo26003/uLSPpic.htm>

<http://www.mrl.columbia.edu/ntm/CrossProcess/CrossProcessSect6.htm>

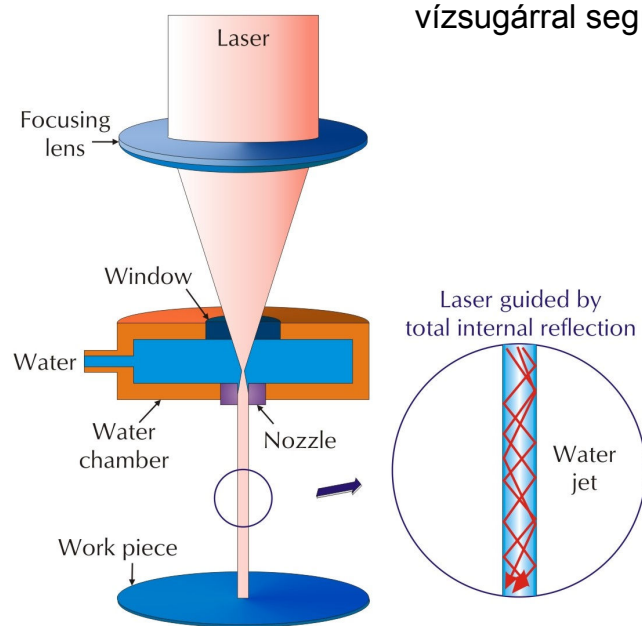
Fotorefraktív keratectomy



<http://www.geocities.com/hotsprings/spa/8079/laser.html>

<http://www.lasersite.com/PRK/index.htm>

Exotikus alkalmazás(ok)



<http://www.synova.ch/>