



# LASER SHOCK PEENING: IMPROVEMENT OF MATERIALS MECHANICAL PROPERTIES

Laser induced shock waves cause localized plastic deformation to generate compressive residual stresses and strain hardening.

## Benefits

- Improves fatigue and corrosion resistance
- Prevents high-cost failures
- Reduces downtime of machinery
- Eco-friendly process
- Allows lightweighting

## Materials

- Aluminium alloys
- Structural and alloy steels
- Titanium alloys
- Nickel alloys

## Performance

Up to 10 times improved fatigue resistance	✓
Depth of compressive residual stresses up to 2 mm	✓
Treatment of hard-to-reach areas	✓
Reduction of tensile stresses and microstructure enhancement of 3D printed parts	✓

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## Laser Systems and Equipment

- High intensity nanosecond laser system (10 ns, 10 J, 10 Hz @ 1030 nm)
- Square, top-hat laser beam profile
- Robotic arm for easy component manipulation
- Loading capacity up to 20 kg

## HiLASE Services

- Evaluation of LSP suitability for your product
- Preliminary process development
- Generation and analysis of compressive residual stresses on your samples
- LSP Implementation into your production

## Surface Conditions

- Cold working process
- Average post-treatment surface roughness (Ra) < 3 µm
- Laser induced strain hardening

- ✓ **Monitoring** and optimization of laser parameters
- ✓ **Stable laser performance** resulting in high reproducibility
- ✓ **Precise control** over laser impact pattern

## Areas of Application



AEROSPACE



AUTOMOTIVE



BIOMED & PHARMA



MARITIME



TOOLING



3D PRINTING



MAINTENANCE SERVICES