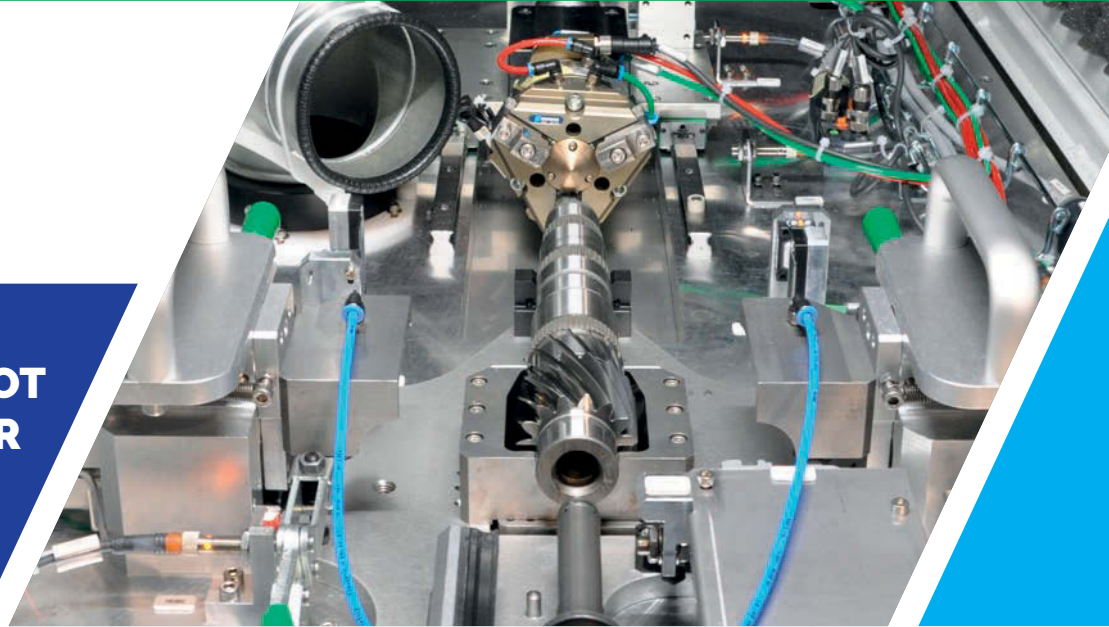




SONATS

Empowering Technologies

ULTRASONIC SHOT PEENING FOR ENGINE & TRANSMISSION



HOW IT WORKS ?

Ultrasonic Shot Peening (STRESSONIC® technology) differs from the conventional techniques by the way the kinetic energy is given to the media thrown against the metal surface to be treated by multiple impacts. Instead of using air flow or high speed turbine, STRESSONIC® is using the acceleration of a vibrating surface. The frequency of the vibration (20 KHz) is within the ultrasonic wave range, which explains the name Ultrasonic Shot Peening.

As the shot media are enclosed during the process within a hermetic chamber, only few grams are necessary, allowing to choose the highest media quality.

STRESSONIC® process is convenient for local peening applications with no risk of media loss. Therefore, it could be used on assembled equipment (Ex : Gas Turbine, Aero Engine without or with limited dismantling).

WHY SHOT PEENING ?

The shot peening in engine industry has been used since decades with the aim to enhance the resistance to many failure modes :

- **Fatigue**
By introducing accurately compressive stresses on the surface of the critical parts, initiation and growth of cracks can be significantly reduced.
- **Stress Corrosion Cracking**
Removing or reducing surface tensile stresses below critical level will reduce significantly the stress corrosion cracking phenomenon.
- **Wear**
The changes in the surface properties (hardness, roughness, resistance...) will lead to a significant reduction of parts wear and increase their life time.

PROVEN APPLICATIONS

Engine

Crankshaft, Camshaft, Connecting rod, Head cylinder, Injector, Steering rack, Drive shaft, tripod, Turbochargers (turbo wheel; Compressor wheel)

Material

Steel, Aluminum, Inconel

Transmission

Gears (Output shaft, Ring gear, Pinions)

But Also...

Suspension, Chassis



EMPOWERING TECHNOLOGIES offers different systems, from handheld STRESSVOYAGER®, including transportable Ruggedized STRESSONIC® Unit, to fully customized production floor machines.

Performances

- Better surface finish than conventional shot peening
- Efficient treatment for complex geometry parts (ex: bore, dovetail...)
- Reduced consumption (shot media, energy, compressed air) => environmental friendly
- Different types of shot media (size and material)
- ALMEN Intensities from 4N to 10C.

Simplicity

- IN SITU treatment
- Shorter treatment cycle without:
 - Preparing the environment
 - Disassembling the surrounding elements
 - Decontaminating the peened part

Control

- Adapted tooling and process for various applications (geometry, power and amplitude)
- Real-time control of parameters
- Guaranteed treatment repeatability
- System ensuring no loss of beads
- Safe process for the treated part

Our services

- Surface treatments services
- Machine design & sales
- Engineering services

Implementation

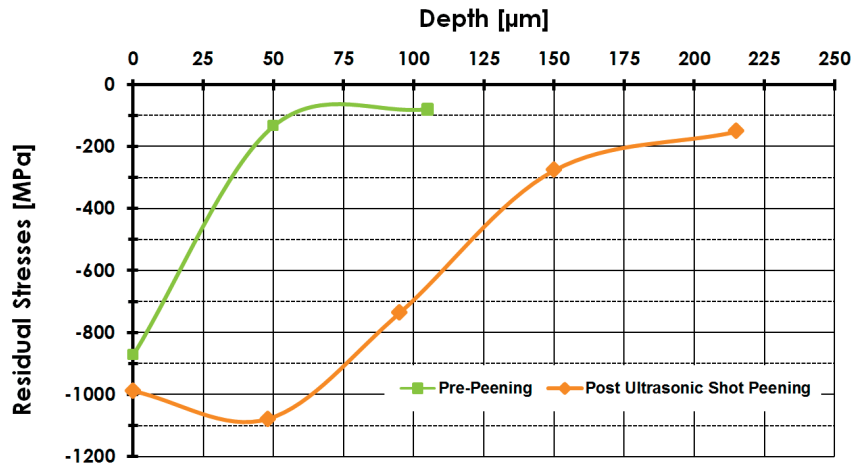
- Study phases and integration of the equipment and technology require a minimum investment and space in your workshop

Cost

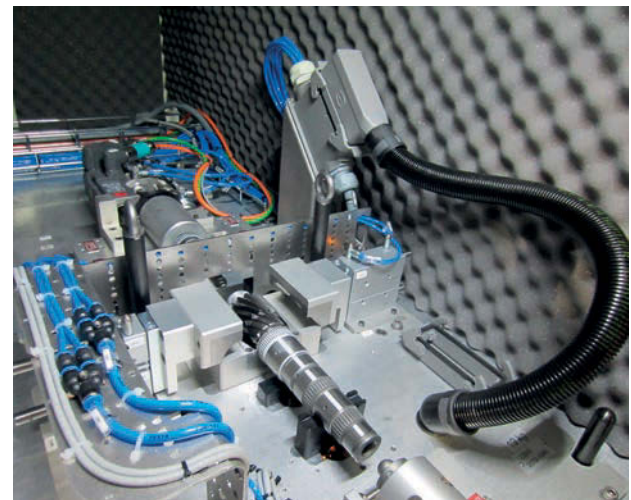
- Low energy consumption (air and electricity) and low consumables needs (media volumes are a lot lower than conventional shot peening) will lead to significant cost reduction.

Environment

- A safe, clean, reliable and energy saver process leads naturally to an environment friendly equipment. The reduction of waste (medias), cleaning operation and desing for lean manufacturing will improve your environmental performance .



Example of Residual Stress profiles on Gears for automotive transmission (Steel alloy)



Outputshaft in an Ultrasonic Shot Peening treatment unit.