CURTISS-WRIGHT

Surface Technologies

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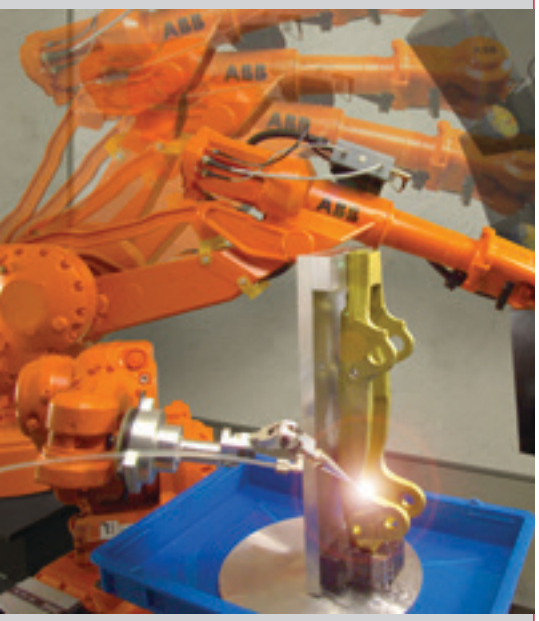
COMPANY PROFILE

Metal Improvement Company is a business unit of the Surface Technologies Division of Curtiss-Wright. We are global specialists in surface treatments which improve performance, prevent premature failures and extend component life. Through an international network of over 65 facilities, we can offer our customers a single source for many of their specialized surface treatment requirements.



Surface Technologies is a Division of Curtiss-Wright (NYSE:CW) a global innovative company that delivers highly engineered, critical function products and services to the commercial, industrial, defense and energy markets. Building on the heritage of Glenn Curtiss and the Wright brothers, Curtiss-Wright has a long tradition of providing reliable solutions through trusted customer relationships.

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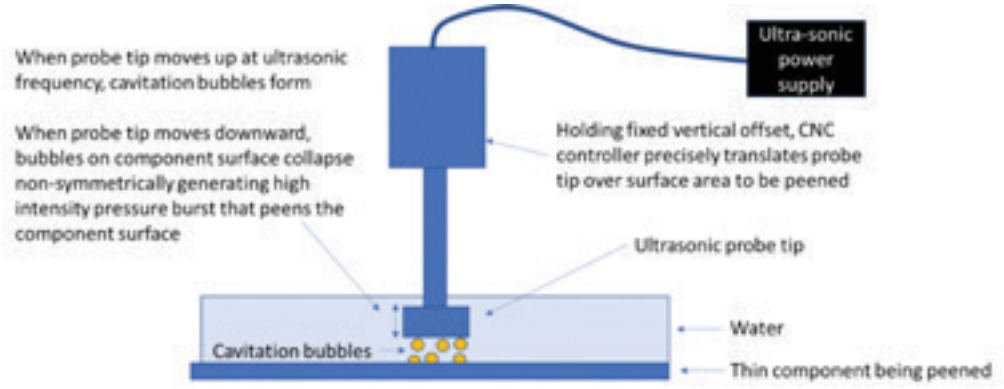
Ultrasonic Cavitation Peening

Ultrasonic cavitation peening produces shallow depths of peening ideal for components of thin section. With the component submerged in deionized water, the process creates microscopic bubbles beneath a pad during the ultrasonic rarefication stroke. The bubbles then asymmetrically collapse during the compression stroke. This asymmetric collapse creates an intense local water jet resulting in plastic deformation of the surface. Because the bubbles are small, the depth of plastic response is on the order of 100 microns (0.004 inches). This shallow depth is ideal for improving the fatigue life of components of thin cross section.



Nonsymmetric collapse of cavitation bubbles creates intense water jet with locally yielding pressure that peens the component surface.

Benefits of Cavitation Peening

- Shallow depth of residual compressive stress for thin delicate components that are required in operation to oscillate or cycle.
- High cycle, low stress situations (HCF) in a deteriorating surface environment.
- Enables peening of components too thin for shot or laser peening.
- Ultra-clean processing enables applications where contamination cannot be tolerated.
- CNC process control results in high processing repeatability and quality control.

Applications of Cavitation Peening

Cavitation peening has applications in the electronics, automotive and aerospace industries specifically in the ever-expanding world of automated control by small and miniature components.

For more information on all our services and full worldwide contact:
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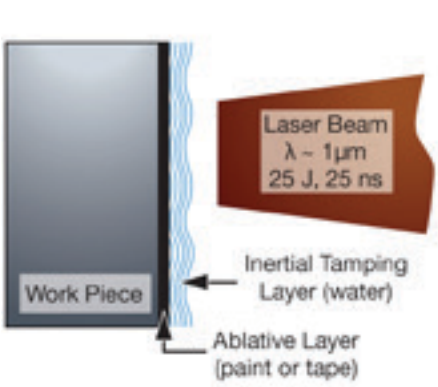
Laser Peening

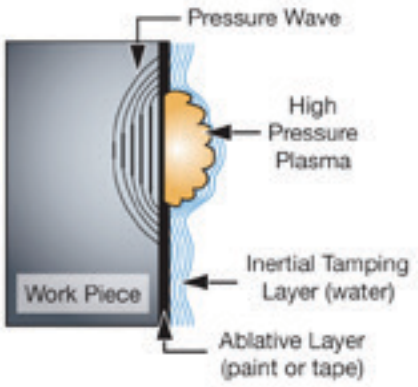
Laser peening induces exceptionally deep residual compressive stresses which enhance the fatigue strength and durability of critical metallic components.

Laser peening is making an important impact on industry as a reliable and production qualified technology. Laser peening offers designers the ability to surgically place residual compressive stress into key areas of components to retard crack initiation and growth enabling increased fatigue strength and component lifetime.

Laser peening is not a replacement for controlled shot peening, but has additional advantages that can influence which method to use:

- Deeper residual compressive stress enabling better resistance to:
  - low cycle, high stress situations (LCF)
  - high cycle, low stress situations (HCF) in a deteriorating surface environment
  - erosion, foreign object damage, fretting and corrosion
- Considerably less cold work enables greater retention of residual compressive stress in high load and/or thermally challenging conditions.
- Lack of shot particles using “clean” technology enables applications where contamination and/or media staining cannot be tolerated.
- Original surface finish and topography more easily maintained and controlled.
- Allows for excellent process and quality control.





APPLICATIONS

Laser peening is used to increase fatigue strength, prevent stress corrosion cracking and extend the service life of critical system components such as:

- Critical aerospace and power generation turbine engine blades and discs
- Aircraft structures, landing gear, control components, form wing skins, and to mitigate tensile stresses in welds.
- Laser extends the degree of curvatures possible, which enables more fuel efficient wing profiles to be achieved.
- Applications have emerged for automotive, power generation, steam turbines, nuclear waste disposal, petroleum drilling, medical implants and recreational sports.
- The technology is initiating deployments in ship and marine applications

With facilities in the US, UK and Singapore and 5 mobile systems, CWST supports customer applications and brings laser peening to our customers’ sites.