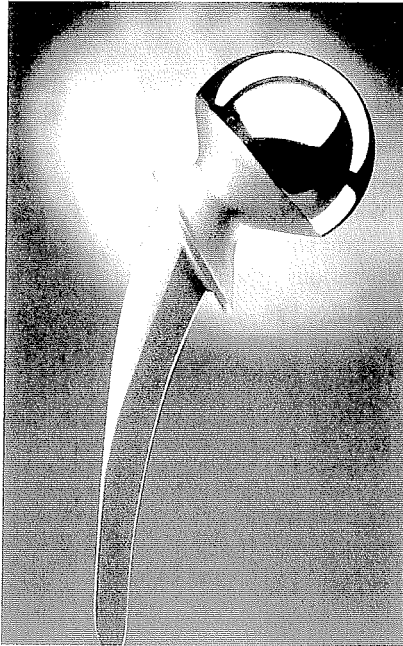


1999097

Vacu-Blast Shot Peening Adds Strength to Surgical Implants

Controlled steel shot peening — a process used widely in the aerospace and automotive industries to enhance the fatigue life and reduce stress corrosion cracking of critical engine, structural and transmission components — is being employed by USF Vacu-Blast to optimize the inherent strength of stainless steel and titanium surgical implants, such as the artificial hip joint pictured here. This has a shot peened shank and shoulder, which is inserted into the femur, and a highly polished ball joint.



As well as increasing the fatigue life of a hip joint or other implant, the peening process has the added benefit of producing a textured surface, which assists in the successful adhesion of the implant with the surrounding bone and tissue.

Vacu-Blast has developed the process in conjunction with a number of UK based surgical implant manufacturers, employing its well proven 'Ventus' cabinet type peening machines, specially tailored for the purpose. When processing titanium, which can create a flammable dust, this includes explosion-relief panels and other integral safeguards. The machines can be manual or automatic.

The peening process involves bombarding the metal surface with a precisely controlled stream of steel shot. Glass or ceramic beads are also used for applications that require a lower intensity peening effect. During the process, the surface layer of the metal becomes plastically deformed, including a residual compressive stress which prolongs fatigue life and inhibits stress corrosion cracking.

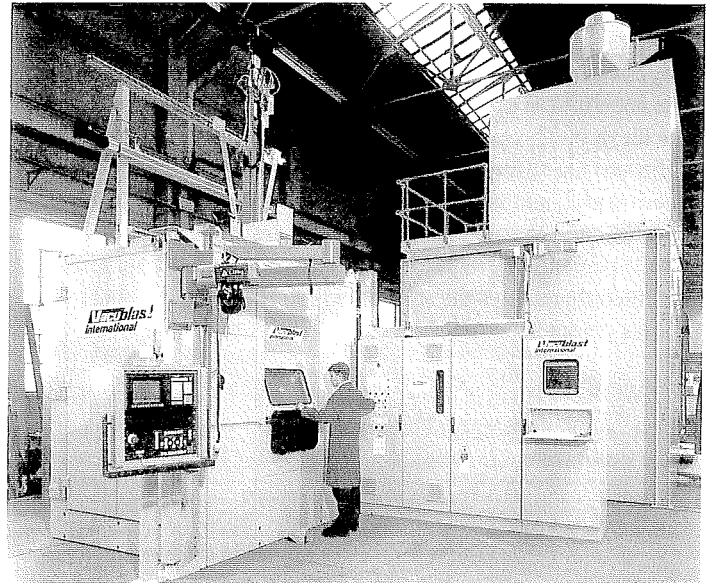
To ensure consistent processing for continuous production, all Ventus cabinet machines incorporate an in-cycle peening media size-and-shape classification system. This recycles reusable media to the peening nozzle and automatically rejects degraded material, together with debris, directing it to a dust collector for easy disposal. All Ventus machines are COSHH-compliant.

1999098 State-of-the-Art Vacu-Blast Peener for Fiat Avio

The second Vacu-Blast machine destined for Brindisi is a 'Ventus 200 ACT' special abrasive blasting cabinet, which will be used for the controlled aluminum oxide etching of various aeroengine parts, particularly fan blades and discs, in preparation for plasma spray and similar surface coatings.

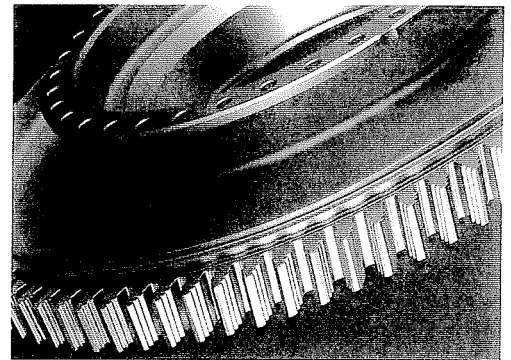
Members of the Fiat Avio group and Vacu-Blast have a close working relationship built up over more than 25 years, and together have pioneered many of the abrasive blasting and shot peening operating and control techniques used widely today throughout the aeroengine rebuild and maintenance sectors.

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An overall view of the Vacu-Blast CNC shot peening system installed at the Turin aeroengine repair and maintenance facility of Fiat Avio.

This military aeroengine turbine disc is typical of the components processed by the Vacu-Blast peener to enhance resistance to fatigue.



Note: Shot peening is a process by which bombardment of a metal surface with a precisely controlled stream of spherical media - usually steel shot or glass or ceramic beads - plastically deforms and induces a residual compressive stress in the surface of the metal. This prolongs the fatigue life of metal components operating under cyclic stress by more than 100% and inhibits stress corrosion cracking.

The process is the modern-day equivalent of an ancient armorer cold working a sword or shield with a 'ball peen' hammer to improve their strength.