

ALPHA ADVANCE LASER



Championing the Future of Surface Science with LSP

Alpha Advance Laser (AAL), a pioneering Singapore-based company, is revolutionizing industrial surface enhancement through its specialized laser-enabled engineering and techniques. As a high-tech service provider, AAL champions Laser Shock Peening (LSP) technology, offering advanced solutions that significantly extend the operational life of critical metallic components and prevent premature failures caused by fatigue, corrosion, wear, galling, and fretting.

AAL's commitment to innovation is evident in its in-house developed laser configuration and unique processing software. This, coupled with a stringent adherence to industry quality standards, has enabled the successful, high-value application of its services across a diverse range of products and sectors, including aerospace, automotive, energy, and medical industries. We passionately believe our products and services are instrumental in helping companies achieve improved operational efficiency, enhanced product safety, and increased profitability through the profound cost-savings derived from superior product life-cycle enhancement.

Some of the successful application and testing using our laser peening techniques include the improvement in fatigue and wear resistance of the leading edge on the fan-blade for the GE Vernona gas turbine engine; fatigue enhancement of the LPC/HPC (Ti alloy) and Welded Ducts (Ni-based) of aero-engines; prevention of SCC (Stress Corrosion Cracking) and premature failure on welded joints for battery packages

used in EVTOL; life-cycle enhancement of flex-spline used in harmonic drives of humanoid robots etc. Other potential applications may include the compacting of TBC coating with base metal; delamination of composite materials for recycling purposes; fatigue improvement for medical implants such as tooth implants etc.

AAL offers an environmentally friendly alternative to traditional methods like shot peening. The process is entirely computer-controlled, pollution-free, and requires no consumables, making it a green solution that actively contributes to sustainable living, environmental protection, and efforts towards carbon neutrality. This advanced approach is poised to obsolete old methodology in the surface treatment industry by replacing less efficient and environmentally impactful techniques.

AAL's dedication extends beyond service provision to in-depth research and innovation, continuously developing new techniques and applications through strategic partnerships with prestigious institutions like the Advanced Remanufacturing and Technology Centre (ARTC) in Singapore.

It is about our reliability – not just to investors, but to all stakeholders, including customers and the broader community. Having significantly invested in surface science, we are now ready to drive and champion these advancements with our innovative technology, aiming to be the game-changer with a purposeful intent.

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