



PRESS RELEASE

FOR IMMEDIATE RELEASE
November 28, 2017
Pictures available on request.

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The Power of Compression by Design

Lambda Improves the Fatigue Performance of Ground-Based Turbines

Cincinnati, OH – Lambda Technologies has designed a component specific surface treatment that mitigates corrosion and fatigue damage, extending the life of gas and steam turbine blades, disks, and bolts. Lambda engineers first determine the depth and magnitude of residual compression required to reduce the tensile stress in critical areas that will mitigate damage mechanisms, including pitting, FOD and fretting. The designed residual compression distribution is then introduced using Lambda’s closed-loop controlled low plasticity burnishing (LPB[®]) process in conventional CNC machine tools. The deep, highly compressive surface layer virtually eliminates the chance of fatigue or SCC failure initiating within the protected zone. Component life and performance can be improved without changing either the material or design.

Even well maintained steam and gas turbines have some material vulnerabilities. The high vibratory stresses and warm, moist environments in steam turbine blades can cause fatigue, corrosion fatigue, and SCC failure. Turbine bolts can be subject to fretting fatigue at the edge of regions of contact. Gas turbine blade dovetails can be vulnerable to fretting initiated fatigue. Stress concentrations from foreign object damage (FOD) or corrosion pits on the blades can initiate fatigue cracking. Frequent inspections are required to check for damage, resulting in down time and labor costs that impact overall operating costs and efficiency.

“As power requirements continue to rise, this cost-effective method of extending turbine component life will be an invaluable tool to reduce operational costs, saving millions over the life of a turbine,” says Dr. Jayaraman, Director of Materials Research for Lambda. Because cracks cannot propagate from minor damage that is shallower than the LPB compressive layer, inspection can be simplified and the frequency reduced. With LPB applied to the high stress locations of critical components, during manufacture or overhaul, operators can be confident that turbine components will operate reliably with reduced operating costs.

Lambda Technologies is an innovative company incorporating a premier materials research laboratory with a world-class engineering and production enterprise dedicated to the development and optimization of surface treatments to improve component performance. For additional information on Lambda Technologies or the LPB process, contact Julie Prev y at (513) 561-0883 or visit www.lambdatechs.com.