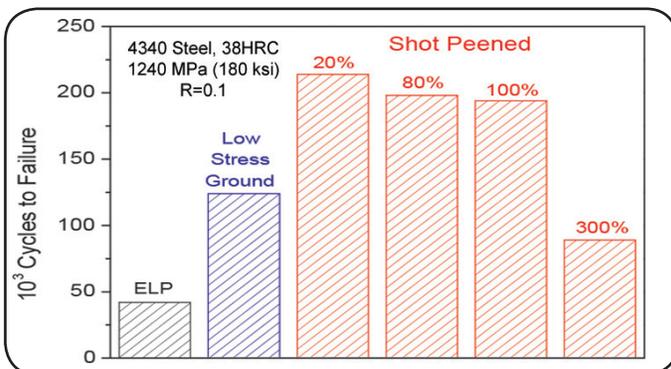
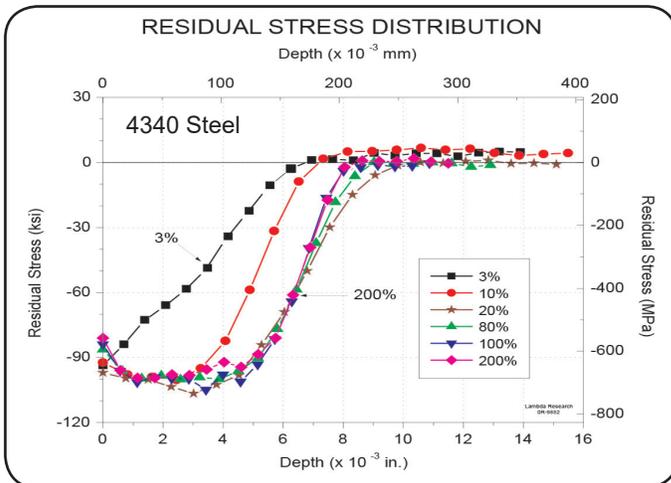


Shot peening is the surface enhancement method most widely used in many industries to improve fatigue performance in critical components. Almen strips are used to establish a saturation curve and control peening coverage to 100%, or often higher. The 100% coverage requirement is based upon the assumption, now known to be false, that every point (or nearly every point) on the surface must be impacted to impart uniform residual compression. Because of the random nature of shot impact, 100% coverage can only be approached asymptotically, and actual “full” coverage is generally 95%-98% coverage. Even peening at 200% to 400% coverage leaves some areas with multiple overlapping indents while others remain untouched.

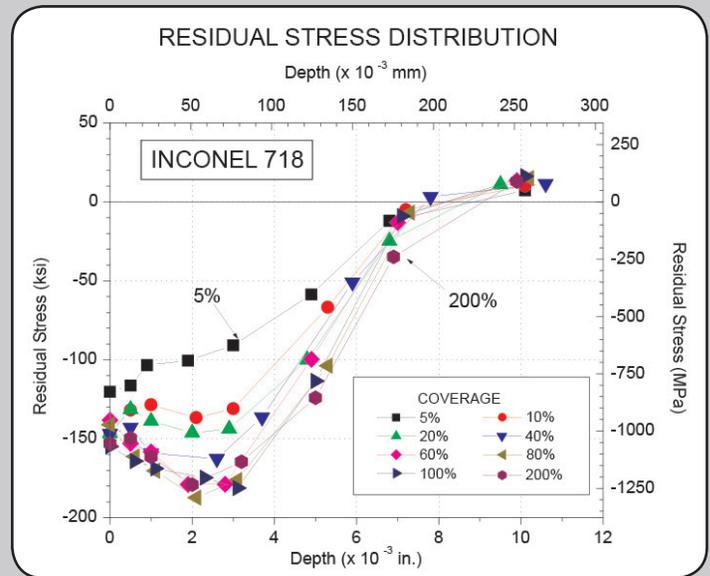
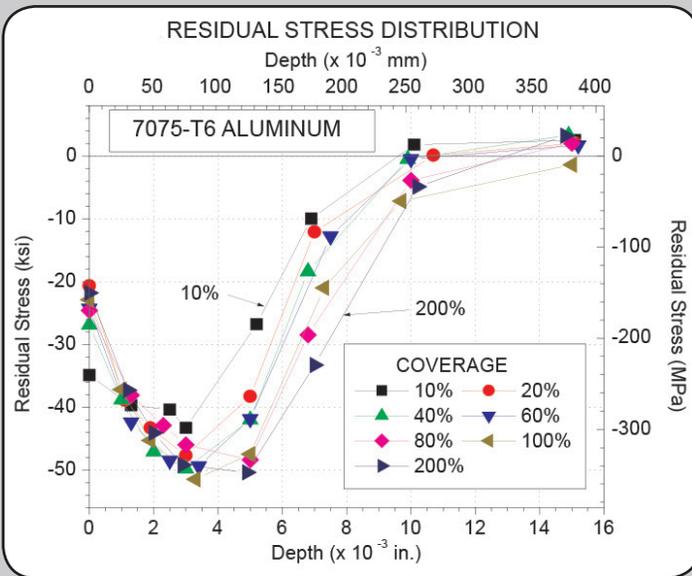


Repeated impacts from excessive coverage can damage the surface by creating laps, folds and micro-cracks, especially at sharp features like edges, bolt holes, and corners. Additional coverage extends processing time, reduces production rates, and increases costs. Increased peening coverage also increases wear on the peening equipment and media consumption, all while potentially damaging the peened surface and reducing the final fatigue performance.

Lambda is now offering our patented shot peening optimization¹ to achieve the benefits of higher production, reduced costs, better fatigue performance, and less chance of peening-related damage. Both empirical^{2,3,4} and analytical⁵ studies confirm that full “100%” peening coverage is not necessary and may not even provide the best fatigue performance.

1 US Patent No. 7,159,425
 2 Kirk and Hollyoak, ICSP9, 2005, p373
 3 Prevey and Cammett, ICSP8, 2002, p 295
 4 Ludian and Wagner, ICPS9, 2005, p296
 5 Ilaneza and Belzunce, J Materials Engineering and Performance, Vol 24(7), 2015, p2806

Compression is now known to extend as far as five times the impact dimple radius, so regions between impacts are in compression, not tension. Because surface compression is supported by subsurface equilibrating tension, surface fatigue initiation is suppressed even at lower coverage. Reduced repeated media impacts provides the additional benefit of lower surface cold work. Work softening of hardened steels is thereby reduced, and the thermal stability of the beneficial compression is improved.



With Lambda's cost-effective shot peening optimization service, the peening specifications of any component can be tailored to achieve optimum fatigue results with faster processing times in your existing production facility. This means increased production rates, less media consumption, lower production costs, and better fatigue performance. Contact Lambda Technologies today to optimize your shot peening process.

- **Up to 5X Improvement in Production Times**
- **Improved Fatigue Performance**
- **Reduced Capital Equipment Investment**
- **Reduced Peening Equipment Wear and Maintenance**
- **Reduced Media Consumption**
- **Reduced Surface Damage**
- **Improved Thermal Stability**