



When Quality Matters

Got a question about shot peening, abrasive blasting, or sample processing? Herb can help.

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Every day, there are more and more 'knock off' products that look similar on the outside but are cheaper in price. In our business, quality is sometimes a tough sell. The reasons for resistance range from "I want to spend as little as possible up front" to "I don't understand why I need to spend more." That's when the discussion turns to value. Deciding what to buy must include a product life cycle cost analysis that goes beyond the initial product price. Other things to consider include labor costs associated with production, and the time and money the customer must spend to get the job done. It boils down to learning how to recognize the benefits of using an efficient, quality product. But quality goes beyond what's apparent on the outside; it's reflected in design, engineering, and tech support—the whole product package.

Fortunately, within the shot peening community, the trend is one of increasing concern with quality. Customers seek great design and engineering, tech support, and an equipment system that consistently gets their job done right as quickly and efficiently as possible. We've noticed that customers are taking a much more serious look at the companies they do business with because they seek expertise, reliability, and trustworthy partners. The reasons more and more customers are taking such a hard look are numerous, but very high on the list is safety and liability. Is it worth the risk of producing a product that may jeopardize safety or the company's reputation?

When it comes to shot peening, expertise is critical. The process of shot peening is exacting. It is used on metal parts that are subjected to frequent cycle stress, stress reversal, twisting, and torsional stresses. To prolong life and avoid early failure caused by a fracture that begins at the surface, controlled shot peening is applied. The shot peening process alters the metal surface through repeated striking with a high-velocity stream of spherical particles. These particles are peening media, most often steel shot, ceramics or glass beads. The media produce round indentations on the surface, causing a stretching of the surface and a rising of the edges of the indentations above the original surface.

Complete peening produces a compressive stress layer, the depth of which will vary from application to application. Beneath this depth, a tensile stress layer develops and achieves equilibrium and provides for longer fatigue life of the shot-peened part.

How does shot peening improve quality?

Shot peening increases fatigue life.

It does so in parts subjected to dynamic loading, which is a repetitive, cyclical loading that causes bending and twisting. Parts like fuel injector components, aircraft landing gear, helicopter blades, leaf and coil springs, gear teeth, drive shafts, torsion bars, axles, rotor, compressor, turbine blades, and many others, see better fatigue life after shot peening.

Shot peening reduces stress corrosion cracking.

Residual stress leaves metals more susceptible to corrosion, particularly in high-strength materials, from a complex interaction of corrosives on sustained tensile stress in the metal surface. Components such as landing gear and hydraulic tubing benefit from shot peening.

Shot peening prepares parts for plating.

Plating often develops fine cracks and preparing a surface with shot peening prior to plating can prevent the cracks in the plating from affecting the substrate in items such as landing gear cylinders, among others.

Shot peening straightens parts deformed during manufacturing.

Selective peening can to a certain degree straighten critical areas. Some applications include bulkheads, large machined structural shapes, and deformed heat-treated parts.

Shot peening reduces tensile stresses after grinding.

The process can convert residual stresses from tensile stress to compressive stress, producing a uniform compressive layer, which increases fatigue life and lengthens the service life of high-strength steel parts.

Shot peening reveals poor bonding in electroplated parts.

When incorporated into a rigorous quality-control program, shot peening can be used to detect adhesion problems and expose imperfections.

Shot peening reduces casting porosity.

Castings are often porous, and shot peening with the right media size can close the pores, compress the surface, and reduce hydraulic leakage in die-cast parts, transmission housings, and gear boxes.

Shot peening can alter part dimensions.

Useful either when first designing and manufacturing a product or when rebuilding one,

shot peening can increase or reduce part size. Shot peening can be used to increase the diameter of a shaft or decrease the diameter of a hole.

Shot peening improves lubricity and oil retention. Because of its effect on the surface, shot peening reduces friction and can improve oil retention, thereby improving lubricity in parts such as engine pistons and cylinder walls.

Shot peening reduces notch sensitivity in high-strength steel. High-strength steel is susceptible to fatigue cracking, also called notching. The stronger the steel, the more likely it is to crack. With shot peening, the steel surface is improved, giving it a longer life cycle. Shot peening is often used to treat steel with a strength rating of more than 200,000 psi. It is commonly used on landing gear and springs.

Safety- and quality-conscious manufacturers understand the benefits of shot peening and carefully follow specifications. They accurately document the process to ensure consistency and repeatability. Proper controls over peening intensity, arc height, and coverage produce consistent results. And sophisticated equipment for monitoring, measuring, and documenting such variables enhance the value of shot peening.

Bottom line: shot peening is complex. Learning everything you can about it, so that you can properly apply it to your particular application, takes time and dedication. Take it from someone who has spent years learning, just follow a few simple steps—make sure your shot peening system is of high quality and engineered to incorporate the features dictated by your application, consult with an experienced practitioner, like me, and attend the Electronics Inc. Shot Peening Workshop. ●

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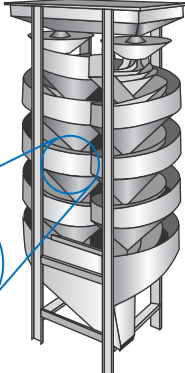






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