

SANDBLASTING - SHOT-PEENING - TUMBLING

SANDBLASTING

In mechanical field **sandblasting** is considered an intermediate procedure in the product working process and it is rarely used as final operation.

It can be used to remove oxide, paint, calcifications, a galvanic or plastic coating, etc.

At the end of the operation, the underlying material to the removed layer results completely open and with dependent wrinkledness from the greatness of the used grit and from the pressure of the throw, but still very accentuated compared to the values typical of the mechanical processes.

Therefore, sandblasting is one of the most widespread treatments to prepare an element to the following varnishing operation and it is mainly used on steel, cast iron, metal alloys in general, timber, ceramics, stone and marble; for mechanical and industrial use, construction (bricks or stone) or nautical (to clean boat hulls) but also to create works of art (carved or glazed glass) or interior design with truly surprising results.

The inert material used is mainly silica sand, but it is also possible to use quartzite powder, sodium bicarbonate, corundum or silicon carbide. How much harder is the grit used and the more sanding will be effective on hard surfaces.

This parameter is closely related to the hardness of the material to be preserved.

Among its most common uses are:

- Preparation of surfaces for subsequent treatments such as anodizing and chromium plating, etc...;
- Removal of oxides and welding residuals;
- Polishing and opacification of moulds for plastic materials and pressure die-casting;



SHOT-PEENING

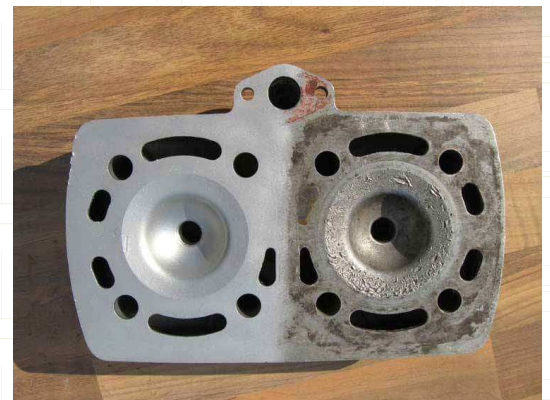
Shot-peening differs from sandblasting for the purpose intended as more similar to rolling because it operates more on the plasticity of the material than the abrasion.

Shot-peening is a cold working process in which small spherical media called shots, or rods obtained cutting a wire (called cut-wire) bombard the surface of a part.

During the shot-peening process, each piece of shot that strikes the material acts as a tiny peening hammer, imparting a small dimple to the surface. Metallic parts such as springs or rods, but also exceptionally pieces in bronze, brass, titanium, aluminium and various alloys may be submitted to this process.

Shot-peening plays a major role in the Aerospace and Automotive fields, since almost all fatigue failures or stress corrosion originates on the part surface. Shot-peening provides a considerable increase in the mechanical part life. In fact, the maximum compressive residual stress produced just below the surface of a part by shot-peening is at least as great as one-half the yield strength of the material being shot-peened. Controlled shot-peening is also used to create the aerodynamic curvatures of metallic plates of airplane wings. Additional applications for shot-peening include closing porosity, improving resistance to intergranular corrosion, straightening of distorted parts, surface finishing, testing the bond strength of coatings and work hardening through cold work to improve wear characteristics.

Shot-peening compressive stresses help increase resistance to fatigue failures, even in aggressive environments or corrosion fatigue, stress corrosion cracking, hydrogen assisted cracking, galling or erosion caused by cavitation.



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Fine shot-blasting is used for:

- Surface roughening to enhance the adhesion of subsequent varnish layers;
- Surface homogenization;
- Removal of oxidations, encrustations, burrs and welding traces;
- Decalaminating of steel items and parts;
- Elimination of inaesthetic angles and sharp profiles.

TUMBLING

Tumbling is a mechanical surface finishing used to eliminate defects in small size components . The tumbling is performed with fully automatic and semi-automatic machines with fully automatic and semi-automatic machines with abrasive plastic cones for deburring.

The surface of the product is tapped with the abrasive cones which remove burrs and imperfections caused by machining or cutting.

This preparation is performed in a barrel known as a “sifter” that rotates on an axis to impact onto pieces with an abrasive material shaped for that purpose. The tumbler rotation speed influences the processing time. This process requires a high precision and an operator with expertise, especially when it is applied to detail work and small size components. A process that lasts too long or that is followed through with inappropriate materials may compromise the quality of the product.



Among its most common uses are

- Drying and deburring of small metal objects (brackets, washers, moulded pieces, ecc.);
- Polishing and deburring of die-cast aluminium pieces;
- Polishing of zama and aluminium pieces
- Polishing of machined steel pieces (toothed profiles, knives , etc.)