WHAT IS SHOT PEENING?

1. Description of Peening

Shot peening is a special metal surface treatment intended to extend the fatigue life of most metals. The impact of small spherical media called shot creates a dent in the surface that is very beneficial in preventing formation of fatigue cracks. The area below each dent called the plastic zone, typically only .020 inch deep, is highly compressed and this action tends to keep cracks from opening in the surface. **Aero Mac Inc**. primarily shot peens **Boeing** airplane parts.

“We make dents”. They must be applied in the correct area of the part (location), they must be the right size and there must be enough to entirely cover the surface and it must be done with the proper size and hardness of shot.

2. Machines

Our peening is conducted in a special cabinet designed to safely confine the media and provide proper aiming of the shot blast stream. The shot at Aero Mac Inc is propelled by a spinning centrifugal wheels on our **Wheelabrator conveyor** system or on the **two Pangborns** which have 72” circular tables.

Other equipment associated with the machine is necessary to recycle the shot and provide for dust collection and disposal for the broken shot. The shot is collected from the bottom of the machine and lifted by a bucket elevator to the shot classifier system.The bucket elevator type system at **Aero Mac Inc.** will spread the shot out to a long narrow curtain allowing it to fall past an air stream that is intended to attract the small broken particles and dust and send them to the waste barrel. The good media is then returned to the shot hopper for re-use.

3. Media

When we make dents we must use the proper media in order to obtain a smooth spherical impact. Broken media will tend to scratch the surface and this could cause an eventual fatigue failure. **Aero Mac Inc.** uses CW-32 hardened carbon steel cut-wire which is made by cutting wrought wire to a length equal to its diameter to form a small cylinder which is then thrown against a hard steel plate to convert it to a spherical shape. This shot is applicable to all alloys including aluminum, steel and titanium.

4. Intensity

When we make dents they must be the right size to get the intended plastic zone that we want under the surface. The size of the dent is mostly controlled by what we call the “Intensity” and intensity is primarily controlled by the shot velocity and also its impact angle. Since we cannot easily measure the shot velocity as it exits the nozzle we must use a sample test coupon developed by J. O. Almen. Almen’s coupon, called an Almen strip, is a precision flat steel spring that is peened on one side causing it to curve in response to the shot stream intensity. By measuring the curvature, or arc height, we can interpret a relative intensity of the shot blast stream.

Some information taken from The Little Book on Shot Peening from Electronics Inc.