

# Centrifugal Wheel Peening Principles

Part one of a five part series by Eugene A. Tarabek\*

Peening equipment is composed of five basic components:

- A. The bladed wheel that centrifugally propels the abrasive at the work.
- B. The abrasive recycling system that cleans, conditions and returns the abrasive to the wheel.
- C. The cabinet, when properly maintained, keeps the abrasive from escaping the enclosure.
- D. The material handling system that positions the work in the abrasive blast.
- E. The dust collector that is responsible for removing the dust and contaminants from the blast machine to provide an environmentally safe operation.

In this first article we'll discuss the wheel unit maintenance and the correct method of setting the blast pattern. The wheel unit is comprised of the following:

1. **Feed spout** - Directs the abrasive into the center of the center of the impeller.
2. **Impeller** - pumps/distributes the abrasive onto each of the blades. The amount of abrasive distributed, on each blade, varies with the horsepower of the motor.
3. **Control Gage/Impeller Case** - when the opening is positioned correctly, it directs the blast pattern of abrasive to hit the product to obtain maximum efficiency and peening.
4. **Blades** - the means used to throw the abrasive, by centrifugal force, at the product.
5. **Wheel Unit** - either the two-sided or single-sided type, depending on the manufacturer, mounted to a hub attached to a unit bearing or motor shaft.

Following are the guidelines of when these components need to be replaced:

**Impeller** - the wear on the rib of the impeller should not exceed one eighth (1/8) of an inch from its original edge. If additional wear occurs on the rib, some abrasive will be allowed to be deposited on the trailing blade, in a smooth manner, it will bounce down the blade surface increasing wear and disrupting the blast pattern.

**Control Gage/Impeller Case** - wear should not exceed three eighths (3/8) of an inch on the cutoff edge of the opening. As the opening in the gage grows, the blast pattern elongates and misses the product, causing wear on the cabinet and work handling system.

**Blades** - once the blades develop grooves they should be changed as this type of wear causes the blast pattern to shift/move missing the product and not peening to requirements. My recommendation is to change all the high wear parts out at the same time as any one of these parts can cause the blast pattern to be off. Suppliers sell tune up kits for wheels that contain all the necessary items to replace all the worn parts in the wheel.

**Wheel Unit** - if maintained properly, it usually lasts for years and needs to be changed once the wear causes it to vibrate. If allowed to operate unbalanced it will eventually cause the wheel unit or motor bearings to fail. ●

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