

# INDABRATOR SHOT BLASTING MACHINES

*blasting forever!*



Indablator shot blasting is a process in which an abrasive material is forced through a jet nozzle using compressed air pressure. This creates a fast and effective way of cleaning or preparing surfaces for recoating using steel shots. Steel shots are sharp, hard abrasive which is used to prepare surfaces on non-ferrous metals before re-coating.

## All Indablator machines incorporate 5 basic elements:

1. One or more wheel units
2. A cabinet that contains abrasive material as it performs its cleaning function.
3. A means of presenting the work to be cleaned the abrasive action.
4. A system to re-circulate and clean the abrasive, removing sand, fines and contaminants from the abrasive mix before returning effective abrasive to the blast wheels.
5. Dust collector to remove all dust and abrasive fines from blast machine to provide an environmentally safe operating atmosphere.

## The wheel

The key component in airless blast cleaning machine is the abrasive-throwing wheel. The intensity of the radial and tangential forces it develops, the abrasive flow volume and velocity it generates, the accuracy and stability of its blast pattern in the target zone-all are vital to the effectiveness and economy of the blast cleaning operation.

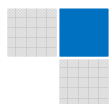
## Blasting

Abrasive from an overhead storage hopper is fed to the center of the wheel unit which is rotating at high speed. A cast-alloy impeller rotates with the wheel and carries the abrasive to an opening in the stationary control cage form where it is discharged onto the bladed wheels. At this point, the abrasive is picked up by the inner ends of the throwing blades and is rapidly accelerated as it moves to the periphery of the wheel.

When the blast wheel is properly adjusted and its elements are in good working condition, the full effect of the blast stream will be attained for maximum efficiency. Some of the more common causes and cures of wheel malfunctions are highlighted on these pages.

## Control Cage

One of the most critical components in the wheel is the control cage. This governs the directions of the blast out of the wheel and onto the work to be cleaned. As little as 10% mis-adjustment of the "hot spot" can reduce cleaning efficiency by 25% or more.



## **Impeller**

Of equal importance in maintaining the desired blast pattern is the effect of abrasive wear on the impeller. If the leading edge of any segment of the impeller becomes worn so that it becomes parallel with the blade, the abrasive will cut through the bottom of the blade and could create wear on the steel spacer and blade slots. Not only will the blast pattern be affected but also wheel imbalance will result creating additional serious problems.

## **Wear Affects Efficiency**

Complaints of longer than normal cleaning cycles, inadequate cleaning and high maintenance costs can usually be traced directly to loss of directional control over the blast pattern. Of course, the blast pattern must be set properly in the first place but it can change for a variety of reasons.

Wear on the wheel parts which control the “Hot-Spot”- control cage, impeller and blades – is the chief cause for changes in this pattern. Inspect them regularly and replace them as soon as excessive wear is detected.

## **Ammeter – A Tool to Control Cleaning Efficiency**

The ammeter on each Indablator machine wheel motor is an important tool to help you control cleaning efficiency. It is the only way of determining at a glance how much abrasive is being thrown by the wheel. For example, on a typical Indablator machine, with a 19 ½” diameter by 2 ½” wide wheels using a 15 HP motor on 440 volts approximately 8 amperes would be used without any abrasive flowing into the wheel. Under full load, 20 amps would be used. The abrasive thrown under full amperage would weigh about 375 pounds per minute or about 31 pounds for each abrasive load ampere. If the wheel were operating at 17 amps rather than 20, there would be over 25% reduction in wheel efficiency.

When the wheel is operating at less than full amperage (as stamped on the plate above the ammeter) this usually means there is an insufficient amount of abrasive in the machine but it may also indicate poor adjustment of the wheel parts, it is important that the cause of this low amperage be corrected immediately since longer periods of blasting are required under these conditions to produce the desired cleaning results.

## **Wheel Housing**

The blast wheel is enclosed within a housing whose primary function is to serve as a safety guard and abrasive seal around the rapidly rotating wheel. To minimize wear on the housing, a series of protective liners are installed inside this housing. The latest protective liner kit, which is recommended for all “M”, “R” and “RLM” wheels, consist of only nine pieces. Labyrinth seals provide an abrasive tight closure between top, side and end liners. The curved top liner minimizes ricochet of abrasive back into the wheel.

## **To Reduce Blast Cleaning Wheel Noise**

One of the chief sources of noise at the blast machine is the opening where abrasive is fed to the blast wheel. The SoundAbator totally enclosed abrasive control valve, which can be installed on most Indablator machine machines, is specifically designed to combat noise from this source by sealing the opening to the wheel. It can reduce the noise level of a typical blast wheel, measured three inches from the abrasive feed inlet, by 25 decibels (A scale).

The SoundAbator also serves another important function by modulating the volume of abrasive flowing to the blast wheel.

### **The Wheel Tune – up Kit**

Everything needed to restore the blast wheel to peak efficiency is contained in this Indabrator machine Tune-up Kit. A handy single package kit containing all the replacement parts needed for a complete tune-up of the blast wheel.

Experience has proven that worn wheel components cut blast cleaning machine efficiency drastically. Also, as components wear out, the blast pattern deteriorates. Abrasive that isn't focused on the work is wasted. So is energy as well as production time and labor.

### **What Your Blast Wheel Expects From You**

By paying prompt attention to danger signals, as indicated by observation and your system of cost control records, you can correct problems before they become costly, and maintain wheel operating efficiency at its highest level.

### **The Abrasive Handling System**

Every Indabrator machine blast cleaning system contains the following elements:

1. The abrasive elevator.
2. A device to move abrasive from the elevator and provide preliminary screening of the abrasive before it enters the separator – this may be by gravity or a screened rotary screw conveyor.
3. An air wash abrasive separator to remove all dust, fines and contaminants from the abrasive.
4. A hopper to collect refuse removed from the abrasive.
5. An abrasive control device (SoundAbator) to control and meter flow of abrasive to the blast wheel.
6. A means of moving spent abrasive, sand and other contaminants to the elevator. This could be a helicoid screw, shaker conveyor or gravity.

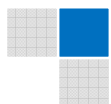
### **The high-efficiency CFS separator**

The role of the abrasive separator in the Indabrator machine operation is to remove sand, scale, abrasive fines and other contaminants from the abrasive operating mix so that only clean abrasive, properly sized, is returned to the blast wheel for reuse. The degree of success of the separator in a large measure determines parts life, abrasive consumption, and the type of finish given the work being blasted, and the speed and quality of cleaning.

Although there are two general types of air wash separators used on Indabrator machine machines – the gravity and compensating –flow (CFS) – discussion here will be centered upon the CFS type because of its more general usage and higher efficiency.

The CFS separator is designed to utilize compensating flow to present a full length curtain of material to the air washing of abrasive. It is designed so that abrasive – not the separator parts.

The overhead rotary screen removes any tramp metal from the abrasive. It also spreads out the abrasive across the full length of the separator. Two baffles, as shown on the drawing - a fixed sliding baffle and an adjustable



swing baffle are utilized. When properly adjusted, the baffles permit only a full width current to be presented to the air currents.

### **Ventilation and Environmental Protection**

Since the blasting action removes sand, scale, rust, etc. from work and reduces the material removed to varying degrees of fineness, an adequate and properly operating dust collector system is necessary for efficient operation of the blast equipment.

The predetermined flow of air from each of the vent points on the Indabrator machine must exist for proper operation of the machine. Although the failure to maintain this flow will soon become obvious through a reduction in cleaning efficiency and dusting at the machine, a periodic check on air volumes will preclude the possibility of an unobserved gradual degradation of operation.

The dust collector is also the air source for the abrasive separator. The condition and efficiency of the dust collector have an important influence on separator efficiency.

When proper ventilation is being experienced at each venting point, static pressure readings (with a manometer) should be taken in each of the vent pipes and these readings recorded as standards for future comparison. Should any future readings show material change in static pressures, it indicates an upset in the condition of air flow, the cause of which should be investigated immediately.

Your Indabrator machine is probably ventilated by either a Indabrator machine (Shaker-type) or ultra-jet (Pulse-type) fabric filters. These are simple yet highly efficient dust collectors and when properly sized will provide adequate ventilation for the Indabrator machine. Listed in the box below are a number of maintenance procedures which should be followed regularly to insure continuing ventilation to the Indabrator machine.

### **The Indabrator machine Cartridge Filter System**

The Indabrator machine Cartridge Filter is a continuous, automatic pulse type Dust Collector. Dust particles are effectively captured on the outer surfaces of the cellulose non-woven fabric cartridges. This construction and the highly efficient filter medium combines features of compact design with ease of servicing. A simple cam locking device is utilized for installation and removal of cartridge filters. The unique venture system sends a periodic metered jet of high pressure air down the inside of the cartridges, halting the in-flow of air and expelling the collected dust from the outer surfaces.

### **Dustube Fabric Filter**

The Indabrator machine Dustube Collector is a simple dependable air cleaner employing cloth filter tubes. Dust laden air entering the collector first strikes a baffle plate. The sudden change in velocity and direction causes heavier particles to drop into the hopper leaving only the finest floating dust particles to reach the tubes. To remove build-up dust from the inside of the tubes, they are shaken when limp.

## Ultra-Jet Pulse-Type Collector

The Indabrator machine Ultra-Jet is a continuous automatic pulse-type fabric dust collector. Its specially designed baffle plates opposite the air inlet deflect incoming dust-laden air around the surfaces of all filter bags. To remove collected dust, a metered jet of high pressure air is released through the jet-pump cleaning system. This inflates the filter tube, halting in-flow of air through the tube and expels dust from the outer surface of the cloth.

## Importance of Abrasive

The final element of blast cleaning is the abrasive itself. Three important factors should be considered to evaluate the performance of the abrasive:

1. The amount of cleaning the abrasive will do in a given length of time.
2. The quality of the cleaning.
3. The cost of performing a given amount of work.

This performance is determined by abrasive breakdown characteristics, the abrasive size distribution in the blast machine and the abrasive hardness.

Abrasive breakdown rate affects the shape of the abrasive in the operating mix, and therefore the maintenance on the blast equipment. Abrasive size distribution is also influenced by the breakdown rate. The smallest size abrasive possible should be selected for each job. The size of the abrasive selected, however, is not the factor influencing consumption. Rather, it is the size at which the abrasive is removed from the machine.

Abrasive hardness is the third major consideration in arriving at proper product selection.

The harder, tougher and more resistant the abrasive, the more useful energy it will impart to the cleaning task.

When possible, use a low breakdown and high hardness product, characteristics found in Indabrator machine Steel Abrasive, for lowest maintenance costs and maximum cleaning efficiency.

Wish you high productivity!

**Team Indabrator.**