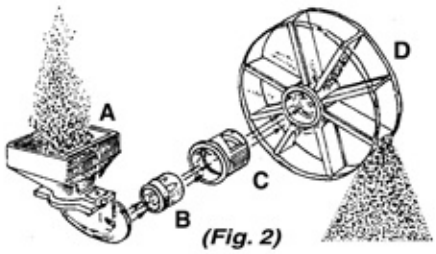


(Fig. 2)

The Wheel (Abrasive Throwing Device) (Fig.2): Abrasives (A) fed through opening into Impeller (B), pass through Stationary Control Cage (C), and are immediately picked up by the Rotary Blade (D). Blade repeats these operations approximately 300 times in a second. The **impact** coverage of the steel abrasive is governed by its **mass** and **velocity** in accordance with the equation of kinetic energy

$$KE = 1/2\ MV^2$$

where, KE = Kinetic Energy, M = Mass, V = Velocity

Wheel diameter and rotation RPM govern the velocity in centrifugal blast unit. Standard 19.5" diameter wheel at 2250 RPM develops abrasive velocity of approximately 245 ft/sec (or 167 miles per hour). Thus the impact force delivered to the work piece will change only if the mass factor (i.e. the abrasive size) is altered. The relationship of abrasive size to both impact power and coverage is shown in Figure 3 (i.e. a Table) here.

Table

Effect of Shot Size on Impact & Coverage

Shot Size (Mid-ange)	Approx. Impact Value*	Approx. Nos. of Shots lib	Equiv. Size of Grit
70	1	82,00,000	G-80
110	4	21,00,000	G-50
170	9	7,45,000	G-40
230	20	3,24,000	
280	33	1,92,000	G-25
330	55	1,14,000	
390	90	68,000	G-18
460	150	40,000	G-16
550	260	24,000	G-14
660	440	14,000	G-12

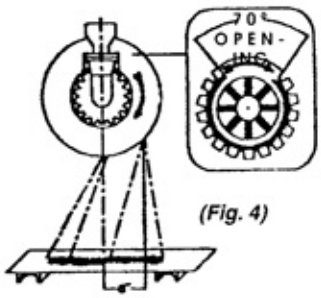
Shot Impact Value varies as the cube of the diameter (2: 1 Size = 8 : 1 Impact Value, and 1:8 number of shots / lb)

*Considering Impact value of 70 size shot as 1.

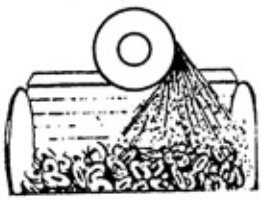
The key to understand the effect of the "Mass" via 'size' choice is that the mass of a sphere varies in proportion to the cube of its diameter. Doubling the shot size increases the mass or impact power per grain eight times. Conversely, doubling the shot size reduces the number of shots per kg to one-eighth.

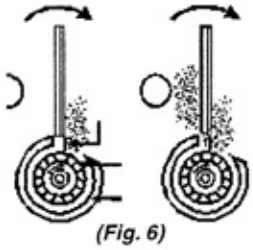
When asked, "When did you last check your Blast Pattern ?", and "How frequently is it done ?", most users did not know the answer or they never had seen it done. Others thought it was unnecessary.

Blast Pattern : Figure 4 shows Blast Pattern located at 8" to the right of the vertical centerline on a clockwise wheel. The pattern is called Hot Spot and will feel quite warm to the hand, if touched immediately after shot blasting. The 1/2" movement of control cage opening will shift the Blast Pattern by several inches.



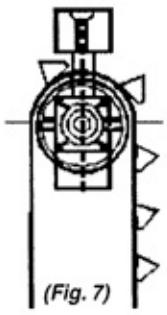
(Fig. 4)


(Fig. 5)


(Fig. 6)

We have found that out of 10 machines, five have **off blast**, causing 30% loss in cleaning efficiency. Wear tolerance has been built into blast equipment, but when wear goes beyond that tolerance, components like Blade, Impeller, Control Cage etc cannot perform properly and Blast Pattern shifts from the set target.

When wear on the leading edge of the impeller segments exceeds 3 to 4 mm, the abrasives will hit the back of the Blade rather then being delivered to the throwing face (Fig. 5). As a result the Hot Spot and overall blast pattern becomes badly diffused and wears the Bare Wheel and the Blade (Fig. 6).


(Fig. 7)

Elevator (Fig. 7) : The elevator bucket lifts spent abrasives from the elevator boot to the head for discharge into abrasive hopper. Elevators are supplied in various sizes, based on the volume of the abrasives and contaminants being handled by the system. The elevator belt should be kept tight and should be in the center.

All elevator belts have adjustable bolts to keep belt properly adjusted in center. If the buckets are hitting the elevator casings, it is an indication that the belt tension needs to be adjusted. Elevator will also jam if blasting operation is started without elevator running or belt slipping because of improper tension.

The wear on bucket should not exceed 6 mm as this will