



Alternators are cleaned with glass beads prior to testing and assembly.

Air Blasting: A Versatile and Controllable Process

by Herb Tobben, Clemco Industries

Blasting using compressed air as the energy source is one of the best ways to alter a surface because it is versatile, speedy, and economical. Enclosed air-blast systems are used in a wide range of industries, and Clemco has provided engineered air-blast equipment to customers such as Ford, Caterpillar, Chrysler, G.E, Westinghouse, FMC, Pratt & Whitney, and Rolls Royce for a variety of applications. The most prevalent applications are shot peening, cleaning, deburring, surface finishing and paint stripping.

Air blasting lets you focus the blast stream on the substrate through the use of one or more nozzles. Blasting can be concentrated on a small area, or dispersed to cover larger areas with multiple nozzles. Nozzles can be manipulated to provide coverage from an infinite number of simple or compound angles. And more nozzles can be added for tough

areas and pressure can be reduced for sensitive areas. This feature of air blasting allows greater blasting control when compared with centrifugal (wheel) blasting. Each nozzle can be monitored and controlled individually. Control and monitoring is extremely important in shot peening applications when specifications like AMS-2432 apply.

For shot peening, you can use steel shot, glass beads or ceramic media, and choose from two types of air equipment systems: Suction and Pressure. The appropriate choice between suction and pressure depends upon the application, and the size and type of media to be used. In a suction blast system, only air passes through the air jet, so the volume of air remains constant yet air and media come out the nozzle. The air jet and nozzle combination creates the vacuum that draws the media into the gun. Air jet and nozzle design is important for the most efficient use of compressed air. Using the properly designed ZERO BNP gun with the correct size air jet and nozzle combination for the work to be completed delivers a very efficient method of blasting.

Suction blasting is generally recommended when smaller steel shot particle sizes from S-70 to S-230 are used, because in the suction process the media are pulled by vacuum from the hopper where they mix with the compressed air in the blast gun. As the air-media mix discharges from the gun, the media pick up velocity as they travel to the work surface. Pressure blasting is the best choice with larger steel shot particles; because with the pressure process air and media mix at the metering valve and travel together through the blast hose picking up velocity along the way and achieving peak velocity when the air-media mix exits the blast nozzle. The larger particle sizes have greater potential velocity.

In a pressure blast system, the size of the orifice of the nozzle controls the volume of compressed air, so as the nozzle wears, the volume of air needed to maintain a constant blast pressure increases. Pressure systems will do three to four times more work than suction systems; however pressure blast systems also require three to four times the volume of compressed air, media breaks down faster, and maintenance costs increase. Pressure systems can be used for all sizes of steel shot and may be required when large shot is used and the customer has the need to blast into deep recesses or blind holes. In addition, for tough jobs like paint stripping, pressure blast systems usually perform better.

To avoid flow problems, it is critical that the compressed air is dry and oil-free. The most efficient equipment cannot do its job without clean, dry air.

Each and every application requires individual evaluation to determine the type of blasting that is most suitable. For air-blast applications, many variables affect the outcome—from the size and type of media, the size and type of nozzle—straight, venturi or side angle—to the type of blast system, suction or pressure.

So, the single formula for success to apply to every job is to recognize that no two jobs can be assumed alike and it's all about manipulating the variables to use the force of compressed air most efficiently.

Herb Tobben, Manager of the Sample Processing Lab for ZERO Automation, creates solutions to customer problems.

