

Static Electricity is More Than a Nuisance to Blasting

by Herb Tobben

Though more noticeable during the dryer winter months, static build up is always an issue for blasting operations, at any time of the year. A few simple steps taken to control static electricity will produce a safer, more comfortable, and, of particular importance, more efficient blast operation.

Most of us will admit that we read the owner's manual that accompanies our new purchase only when we encounter a problem. So, worth noting here is the fact that every ZERO cabinet operation manual contains important information about the safe and efficient use of our equipment. Reading the manual and selecting the right media for your blast application are only the first steps to achieving an efficient operation.

Blasting, by definition, brings together elements that as a matter of course have materials flowing through pipes or hoses; the activity and conditions surrounding blasting generate static electricity. Dry air, essential to an efficient blasting operation, contributes to the build up of static electricity. The movement of blast media particles through hoses to the nozzle / gun, over the part being blasted, and in the recovery hose generates static electricity. Cyclone-type separators and media classifiers, where media and dust swirl over large surface area, normally generate a static charge. This charge must be continuously dissipated to prevent an accumulation of an electrostatic charge that can result in a spark. If not dissipated, in a manual blast operation, the static charge is released when the operator comes in contact with the cabinet, usually around the armhole or wherever the operator leans against the cabinet.

To keep static electricity from building to a dangerous level, which may cause a fire or an explosion, the cabinet must be connected to an earth ground. With all the components interconnected, all are at the same electrical potential.

Take care to do the job properly when grounding equipment. Connecting to a metal-frame building, water pipe or electrical conduit on the wall does not control static, as an electrical neutral-wire or third-wire ground may carry static current in certain locales. When grounding, clean and remove any paint and rust from the contact area for a good conductivity. It is prudent to

consult the requirements of the National Electric Code and National Fire Protection Association Lightning Protection Code.

Static grounding cables must be low-resistance at or below 5 ohms of ground. For permanent installations, check the ground with an ohmmeter at least once a year. For temporary or portable installations, check the static ground at start up and again each time the equipment is moved.

To avoid getting 'zapped', even with a well-grounded cabinet, keep the part being blasted in contact with the metal grate or attach a ground clamp to the part to dissipate the charge created by the blast media exiting the nozzle and going over the part. And, not all rubber mats are created equal. If you stand on a rubber mat, make sure it is designed to dissipate static and is connected to earth ground. At the time of manufacture and assembly, all ZERO cabinets are fitted with air- and media-conveying hoses that contain a conductive material to reduce static; similarly flexible exhaust hose contains a spiral wire. The spiral wire serves two purposes. First, it keeps the hose from collapsing under vacuum, and second it helps dissipate static build-up in the hose when grounded at each end. The spiral wire is not a replacement for a ground wire to each component.

Sometimes, despite proper grounding throughout the blast equipment, a static charge can build due to the type and configuration of the part. And some parts, such as semi-conductors can be damaged by static electricity. Though overlooked by many people, clothing and the type of shoes worn by the operator can contribute to the problem. With sit-down style ergonomic cabinets, the operator may be isolated from the ground and therefore vulnerable to a static charge. Wearing conductive shoes and keeping a foot on the grounded cabinet will prevent the operator from becoming charged. Avoiding all nylon clothing is also a good idea, as nylon is an insulator.

From an operational standpoint, when static electricity is left unchecked in a manual or automated system, the static can cause media flow and separation problems. Media will cling to the cabinet walls, will hang up in the recovery hoses, and even cling to itself resulting in media flow problems. With a static charge, media may cling to the part, and negatively affect the media cleaning process as fines and broken particles will cling to the larger reusable particles.

Grounding is the key to reducing the risk of static shock and avoiding efficiency-robbing static build up throughout the blast system. Taking these extra steps makes working at the blast cabinet more comfortable for the operator and ensures the cabinet system functions at its optimum level of performance. ●

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Ground from cabinet



Ground to earth



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