Ventilation Training

Controlling & Removing Static Electricity During Confined Space Entry Ventilation

Confined Space Entry

Do It Right The First Time

10" In-Line Explosion-Proof Electric Axial Fan
- Weight: 32 lbs
- Frame: All steel, powder coat red with rubber base feet
- Inlet/Exhaust flange made of molded conductive polyethylene
- Explosion-proof Electric Motor: 1/3 HP, 115 VAC, 1-phase, 60 Hz. UL and approved for Class 1, Div. 1, Groups C and D, Class 2, Div. 1, Groups E, F, and G
- Automatic reset thermal overload
- Power cord: 10 ft. SOOW cable with installed strain release
- External on/off switch
- Grounding lug installed on steel housing on explosion-proof model
- Flow: 1350cfm free air delivery
- 72 dbA @ 3 ft
- Customer supplied plug

Full Line Catalog Available at www.airsystems.com

© 2012 Air Systems International  All Rights Reserved
 Controlling & Removing Static Electricity During Confined Space Entry Ventilation  

By: Dave Angelico, President, Air Systems International, Inc.

The Safety Industry needs a clear well defined "How-To" Standard on the proper procedures for controlling and safely removing electrostatic charges during confined space ventilation.

Working in tanks, manholes and underground storage tanks can be some of the most dangerous and potentially lethal occupations found in the industrial work environment. Federal, State and corporate safety departments have written reams of documents and procedures on how to safely enter a confined space and perform some sort of maintenance, repair or cleaning operation. Good corporate work practices and procedures have existed for years at the industry specific level. However, telecommunications companies, petroleum refineries and renewable energy companies have been left on their own to work on their specific confined space hazards. The current OSHA Standard, 1910.146 "Permit-required Confined Spaces", governs entrants and safety equipment in confined space ventilation and identifying some of the hazards a worker may encounter. This OSHA Standard was the outgrowth of many existing standards that came together to provide minimum guidelines for General Industry to follow. The one process needed in the OSHA Standard is a practice for the safe removal of static electricity during confined space ventilation and a means to test it. This work practice should be simple enough for all industry trades to be able to perform.

Meeting Industry Demands

As time in our lives we have all felt the effect of static electricity build-up. Walking across the living room carpet and touching a metal doorknob or refrigerator and we feel and see the spark of discharged static electricity. Static is generated whenever two dissimilar materials are in relative motion to each other. I recently was filling my car with gasoline and I noticed a Static Electricity Notice on the gas pump. The manufacturer of the gas pump very plainly and simply explained that if I get out of my car to put fuel in the tank, please do not get back in the car with fuel pumping until I touch the car frame of the car and discharge any potential build-up of static electricity or a resulting explosion could occur. About three years ago, a Safety Director at an Ohio hospital complex called me after purchasing an explosion-proof blower system including a Saddle Vent ® to move the air. He asked me to do an electrostatic charge build-up testing. He asked me to test the system for static electricity build-up and dissipating static electricity. He explained to me every ventilation system in their hospital was grounded and had to be tested to ensure it had a good ground so no static electricity was able to build up on their fans and blowers. These examples prove companies need to have a well defined procedure for controlling static electricity. The one ingredient missing in these standards is the aspect of "How-To Set Up and Test a complete grounded ventilation system.

Static Electricity - The Basics

At some time in our lives we have all appreciated the effect of static electricity build-up. Walking across the living room carpet and touching a metal doorknob or refrigerator and we feel and see the spark of discharged static electricity. Static is generated whenever two dissimilar materials are in relative motion to each other. Free electrons are attracted to any other electron deficient nucleus. Movement of electrons from one atom to another constitutes what is referred to as electrical energy, including static electricity. What causes these electrons and static charges to migrate from one atom to another? The movement of static charges is due to such factors as a small change in temperature, atmospheric pressure, relative humidity and the friction of air through a piece of ducting. The energy needed to cause the movement of atoms is surprisingly small. Free electrons can also move freely through materials with high electrical resistance; these items are called nonconductors or insulators. Examples of non-conductors would be glass, certain gasses, rubber and many plastic materials. Static electricity is known as a "dancing electron" process. The conductive Saddle Vent ® System is now available in conductive plastic materials and when properly assembled, forms a complete electrical circuit (bond) from the farthest end of the duct all the way back to the grounded ventilation blower. Electrostatic charges that traditionally build up on the surface of the Saddle Vent ® ducting can now be safely removed through the use of conductive plastics; this process is called the Conductive Saddle Vent ® System.

Test the Ventilation System for Conductivity

Prior to the start of the ventilation process, the entire Conductive Saddle Vent ® System should be set-up and tested to assure a complete circuit has been achieved. The ventilation system should include a pneumatic or explosion-proof electric blower, a Conductive Saddle Vent ®, conductive duct with attached ground wires on each end; all components should be attached together with screws from the time of setup until the very last part of the testing. A lead from a voltmeter should be attached to the farthest end of the ducting and its metal helix and the other lead should be attached to the metal frame or ground lug of the blower. The voltmeter should provide a reading less than 500K ohms to properly ground the system. The test for conductivity is being utilized to control your work environment - Choose the Conductive Saddle Vent ® System.