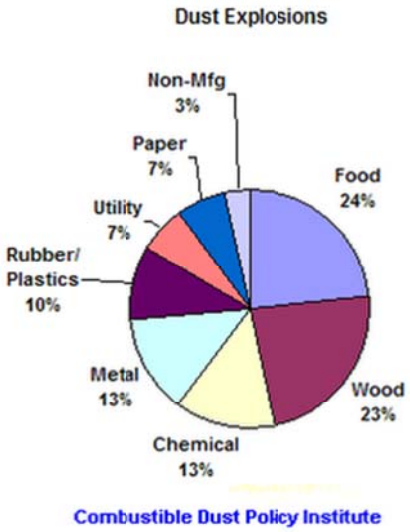
Tel: (800) 736-6288
E-mail: info@ruwac.com
http://www.ruwac.com
dustincase.ruwac.com

Immersion Separators: A Liquid Solution to Combating Combustible Dust

When dealing with flammable dusts in the work environment, it is critical to clearly identify the specific hazard applicable to that specific dust. According to a 2008 study by the Combustible Dust Policy Institute, metal and chemical dust explosions combined resulted in over a quarter of the 200+ combustible dust-related fires and explosions in the grain, manufacturing, utility, and non-manufacturing sectors during that year, proving that many are either unaware or ignoring the dangers their materials pose.

Many combustible dusts can be easily be vacuumed with an explosion-proof certified vacuum cleaner fortunately. However, some dusts require special handling. Dusts that are classified as explosive, impact sensitive or propellants are of particular concern. These dusts include aluminum, magnesium, titanium and zirconium fines which are identified as having a mean diameter of less than 450 microns. Because of their high Kst values, these sensitive dusts should not be vacuumed by a dry vacuum.



The science of removing combustible dust is more complex than just plugging in any vacuum system and letting it go to work. You'll need to confine the dust in an area that can provide airborne moving particles, oxygen and is absent of an ignition source. This is basically everything that happens inside the atmosphere of a certified explosion proof vacuum. However, the danger of an ignition source entering the vacuum system is always possible. This is where the immersion separator becomes the safest solution in dealing with these dusts. An immersion separator neutralizes these dusts under a liquid bath (consisting of water and sometimes oil,) eliminating the risk of a deflagration even if an ignition source is accidently vacuumed into the separator. It also eliminates the risk of a static related discharge within the containment vessel. All in all, the immersion separator offers the safest solution in dealing with sensitive compounds.

With an immersion separator, 100% of the intake air is submerged inside of a turbulent liquid bath. Once contained inside the vessel, the centrifugal force caused by the powerful vacuum system pressures the dust particles to be penetrated within the water droplets and become entrapped. The contaminated water is then removed from the airstream by special mist filters while any outside ignition source will be quenched prior to reaching any of the already collected materials. No internal dust clouds can form nor will any internal moving combustible dust be available. If any potential explosive gases should form within the vessel during all of this, the immersion separator's hydrogen relief valve will provide an escape for it, meaning once again there is no way for an ignition source to be present inside the vacuum system. The neutralized

dust then forms into a state of sludge, settles to the immersion separator's bottom collector (which can easily be drained and rinsed off upon completion) and the water is reused for further material immersion.

On a final note, it's important to also mention that in almost all conductive metal applications, the atmosphere that the vacuum is being used in has not been classified. This means it has standard motors, switches, lights and other electronics running in the room (Note: For dry systems, the vacuum should be located outside with proper explosion venting.) Therefore, the hazard is *NOT* in the atmosphere, but rather when you confine the dust inside of a vacuum and create a bomb-like environment that can easily react inside. Removing combustible dust made from conductive metals by using an immersion separator system that meets OSHA and NFPA requirement is the only possible way to safely rule out this danger.