



New Dust Explosion Test Instrument Developed In-House at TestSafe

David Pearson, Fire & Explosion Specialist, TestSafe Australia

The Fire & Explosions Unit at TestSafe has just completed commissioning and calibrating a new dust explosion testing pressure vessel.



Dust explosions are a poorly understood risk in many process industries. There is a major dust explosion in NSW every year or two. TestSafe has for many years provided a flammable dust testing service to industry.

Commercially available dust explosion vessels are available “off the shelf” from Germany at a cost well over \$100,000. Our new 20-litre vessel was designed “in-house” at TestSafe and manufactured locally at a total cost of less than \$15,000.

A novel computerised data acquisition and control system was developed which greatly improved the instrument’s reproducibility. In what is probably a world first, the ignition of the dust cloud inside the vessel is timed to occur a fixed time after a sensor indicates that the dust injection valve has opened. This innovation allowed standard readily available pneumatically actuated ball valves to be used where in the past costly proprietary quick acting valves had been required.

In a recent international inter-laboratory round robin comparison trial, our new 20L vessel produced less variability than most of the very expensive commercially manufactured vessels. Our much larger 1000 litre ISO 6184 dust explosion vessel also performed well.

The calibration process was more challenging and lengthy than expected. I am grateful for the perseverance of my colleague Daniel Massey who put in a lot of work, so that the vessel is now performing so well.



Left to right - Daniel Massey, Fire & Explosion Specialist with David Pearson