

AimSizer/LNO.0069

The Development of a Portable Device for Dust Explosion Test and Demonstration

Abstract: With the development of powder industry, the hazard of dust explosion has been increasing greatly. In China, because the knowledge and relative researches of dust explosion were initiated lately, there has been a lack of experimental equipment for safety education and training. Accordingly, the author put forward a research of portable apparatus for dust explosion test and demonstration. On the basis of traditional Hartmann tube structure, the original tube material, that is the plexiglass, has been replaced by the Nickel-chromium alloy steel to bear the maximum pressure generated by explosion; in order to improve the portability of the device, the top and bottom parts of the body of the tube both use screwed structure; the setting up of the pressure sensor and the connector for explosion venting on the cover can not only make it be used to test the signal of explosion pressure, but also make it be used to observe the sound and flight effects of dust explosion p the using of singly-chip microcomputer system to control the delay time of ignition and the time sequence of spraying powder makes the operation simple, accurate, reliable and safe; by adjusting of the dust concentration and the presser of spraying powder , the maximum explosion pressure and explosion limits can be tested, and them, the data of the maximum explosion pressure will be showed through LED after processed by computer. In a word, the device has following characteristics: easy to carry, simple to operate, good showing effects of explosion and cost-effective and so on, so, it can be used to make dust explosion test and teaching demonstration experiments at anytime anywhere.

Key words: viscous particles; viscous resistance; liquid bridge; analytical solution; laser particle size analyzer; particle size analyzer; aimsizer; as-2011 micron laser particle size analyzer; as-2012 submicron laser particle size analyzer

Excerpt from CHINA POWER INDUSTRY

By Chen Lijuan, Hu Zhifeng, Wang Jiazhen, Li Gang

(Safety Engineering Research Center, Northeastern University, Shenyang 110004, China)