

European standardisation in the "non-electric field": "Devices and Systems for Explosion Prevention and Protection"
Europäische Normung im "nichtelektrischen" Bereich: "Apparate und Systeme für Vorbeugung von Explosionen und Explosionsschutz"

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SUMMARY

In CEN/TC305/WG3 "Devices and Systems for Explosion Prevention and Protection" standards are being developed relevant for the protective techniques explosion proof construction, explosion venting, explosion suppression, isolation and inerting. A status report is presented.

ZUSAMMENFASSUNG

In CEN/TC305/WG3 "Apparate und Systeme für Vorbeugung von Explosionen und Explosionsschutz" werden Normen entwickelt für die Schutzarte Explosionsfester Bau, Explosionsdruckentlastung, Explosionsunterdrückung, Explosionssperren und Inertisierung. Vom Stand wird berichtet.

1 INTRODUCTION

In CEN/TC305/WG3 "Devices and Systems for Explosion Prevention and Protection" standards are being developed relevant for the protective techniques explosion proof construction, explosion venting, explosion suppression, isolation and inerting. The work involves the drafting of standards for flame arresters, venting devices, explosion proof equipment, explosion suppression, dust explosion vent sizing guideline, gas explosion vent sizing guideline, explosion barriers and inerting. Representatives from industry, consultancies, research institutes and authoritative bodies carry out the work.

In this short paper today's state-of-the-art (February 2001), 7.5 years after the start of the work is presented.

2 FLAME ARRESTERS

Flame arresters are used as isolation system and are applied to prevent flame transmission when flammable gas/air or vapour/air mixtures are present. The standard which has been offered for formal vote and today is available as a prEN standard (prEN 12874) establishes principles for the classification, basic construction and marking and specifies test methods to verify safety requirements and limits of use.

3 EXPLOSION VENTING DEVICES

Explosion venting devices include explosion doors, venting panels, bursting discs and flameless explosion venting devices (e.g. Q-pipe). The draft standard specifies requirements for manufacture, inspection, testing, marking and documentation. It considers both gas- and dust explosions and is

specially aiming at protection of process vessels. A main challenge for this standard is the effect of inertia of the venting device. The final draft is expected to be discussed during the next WG3 meeting in April 2001.

4 EXPLOSION RESISTANT EQUIPMENT

The latest draft of this standard was issued in October 2000. It treats explosion pressure resistant and explosion pressure shock resistant equipment, which can be applied to withstand the maximum explosion pressure or the reduced overpressure in conjunction with explosion pressure relief or suppression (gas and dust). The draft standard uses the draft pressure vessel code (from CEN/TC54) as an important reference document. The final draft is expected to be discussed during the next WG3 meeting in April 2001.

5 EXPLOSION SUPPRESSION SYSTEMS

This standard has been approved by WG3 and is in the phase of being translated in German and French. It describes the basic requirements for design and application of these systems. It specifies a method for evaluating its effectiveness and its scale up. It also covers installation and maintenance requirements. As applications process vessels, open structures and explosion protection combination systems (e.g. suppression combined with venting) are treated.

6 DUST EXPLOSION VENTING SYSTEMS

The final draft of this standard, aiming at giving guidance for vent sizing against the internal pressure effects of a dust explosion, will be discussed during the next meeting of WG3 in April 2001. The standard uses the VDI guideline 3673 as a starting point (as a matter of fact the equations proposed for the latest draft of VDI3673 of December 2000 have been used in the European draft guideline). The guide covers, vent sizing (up to vessels with $L/D=20$), flame and pressure effects outside the protected enclosure, recoil forces and the influence vent ducts.

7 EXPLOSION BARRIERS

The work for this standard, treating the design, construction, testing and certification of barriers such as explosion extinguishing barriers, rotary valves, fast acting slide valves and explosion diverters was started in the summer of 1999. The work is progressing well and a first full draft may be expected in the course of 2001/2002.

8 GAS EXPLOSION VENTING SYSTEMS

This standard when available aims at giving guidance for vent sizing against the internal pressure effects of a gas explosion. The standard uses the NFPA68 guideline as a starting point. The work was started in the summer of 1999 and a first full draft is expected early 2002.

9 INERTING

During the latest meeting of CEN/TC305 inerting was accepted as a work item for writing a standard. A scope has been prepared and after approval of this scope the work will be started aiming at finishing a first draft in 2003.