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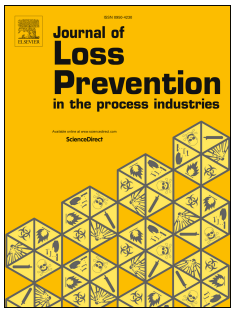

Explosion venting of hybrid mixtures: A comparison of standards NFPA 68 and EN 14491

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Explosion venting of hybrid mixtures: a comparison of standards NFPA 68 and EN 14491

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Abstract: Hybrid explosion venting experiments were performed in a 20-L spherical vessel. Three vent diameters of 28, 40, and 60 mm were chosen to carry out the venting experiments at static activation pressures ranging from 0.66 to 2.80 bar. The experimental results were compared with the calculated results according to NFPA 68 and EN 14491 with the aim of examining the applicability of the two standards for the venting of hybrid explosions. The comparative results show that the vent areas obtained following the criteria of EN 14491 are always greater than those obtained with NFPA 68. For a hybrid mixture with a high concentration of methane, the predictive results given by NFPA 68 tend to be conservative, but the predictive results obtained with EN 14491 tend to be dangerous. However, the predictive results calculated according to NFPA 68 and EN 14491 both tend to be conservative as the vent diameter decreases and the static activation pressure increases. Although the predictive results obtained with NFPA 68 and EN 14491 are both conservative, only NFPA 68 gives a good prediction for hybrid explosion venting with vent diameters of 60 and 40 mm.

Keywords: dust explosion; hybrid mixture; venting; NFPA 68; EN 14491

1 Introduction

Hybrid mixtures, which are often encountered in industrial processes, have caused many

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