
International Standard



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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Explosion protection systems — Part 1: Determination of explosion indices of combustible dusts in air

Systèmes de protection contre les explosions — Partie 1: Détermination des indices d'explosion des poussières combustibles dans l'air

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Explosion protection systems —

Part 1: Determination of explosion indices of combustible dusts in air

0 Introduction

0.1 The assessment of measures required to provide protection against explosion hazards involving combustible dust/air mixtures requires prior determination of the potential explosion severity of such mixtures, by the measurement of explosion indices. Conversely, the measurement of the effectiveness and performance of explosion protection systems requires that they should be tested against explosions of known severity.

The severity of a dust explosion is a function of the following:

- a) the physical and chemical properties of the dust;
- b) the concentration of dust in the dust/air mixture;
- c) the homogeneity and turbulence of the dust/air mixture;
- d) the type, energy, and location of the ignition source;
- e) the geometry of the container;
- f) the temperature, pressure and humidity of the explosive dust/air mixture.

0.2 This part of ISO 6184 is one of a series dealing with explosion protection systems. The other parts are as follows:

Part 2: Determination of explosion indices of combustible gases in air.

Part 3: Determination of explosion indices of fuel/air mixtures other than dust/air and gas/air mixtures.

Part 4: Determination of efficacy of explosion suppression systems.

0.3 The interpretation of explosion indices determined by the method specified in this part of ISO 6184 and their relation to the development of explosions in commonly encountered explosion hazards should be recognized. In particular, the degree of turbulence can influence the hazard significantly. In practice, the link between a given degree of turbulence and a specific

type of hazard is the responsibility of specialists in the fields of explosions and explosion protection.

Two extremes of turbulence commonly encountered in industrial plants are:

- a) low turbulence conditions prevailing in a gravity-fed silo;
- b) high turbulence conditions prevailing in a grinder or micronizer.

It should be realized that turbulence can arise in two ways:

- a) turbulence intrinsic to the plant, under normal operating conditions, as a consequence of perturbations to the air-flow;
- b) turbulence induced by obstructions within an installation on a gas which expands as the result of an explosion.

1 Scope

This part of ISO 6184 specifies a method for the determination of the explosion indices of combustible dusts suspended in air in an enclosed space. It gives the criteria by which results obtained using other test procedures can be correlated to yield explosion indices as determined by the method specified in this part of ISO 6184.

2 Field of application

This part of ISO 6184 is applicable only to the determination of explosion indices pertaining to the development of contained dust/air explosions after ignition of the reactants. It does not apply to indices pertaining to the conditions necessary to cause ignition of the reactants. If the specified experimental procedure for the determination of explosion indices does not result in ignition of the dust/air mixture, it should not be concluded that the dust in question cannot explode. The interpretation of such cases should be left to specialists in the field of explosions and explosion protection.