



Expert commentary

BS 60080:2020 — *Explosive and Toxic Atmospheres: Hazard Detection Mapping – Guidance on the placement of permanently installed flame and gas detection devices using software tools and other techniques*

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1 Overview

This British Standard, which is written as a general guidance document, greatly assists with one of the most challenging variables found in industry pertinent to fire and gas detection safety systems. For the first time, a British Standard guides engineers in a firm direction resulting in greater safety factors as there will be an improved understanding on how many, which technology and where to locate permanently installed flame and gas detectors. Unlike BS EN 54 and BS 5839 which are product related and prescriptive based standards, respectively for fire detection and alarm control in buildings, this British Standard is driven by a demand from the Industrial sector for both enclosed and open space hazardous processing areas.

1.1 Reasons for introduction

There are many fundamental reasons why this British Standard is introduced. The main two reasons are supportive of each other.

- this British Standard connects the meagre guidance of detector placement, which has been cited in different British Standards for decades with proven techniques and measures adopted by the most onerous and dangerous industries of oil and gas exploration and production.
- to ensure a repetitive method is used to determine the coverage of flame and gas detectors in a facility throughout its lifecycle

The challenge of flame and gas detector coverage is supported by some historical field trials and experiments, e.g. research by HSE, DNV-GL and others, and has generally concentrated on fire (flame) size or grid separation of hydrocarbon gas detectors related to explosion pressures. The introduction of this British Standards now supports toxic and oxygen gas hazards alongside flame and hydrocarbon hazards.

The myth of flame and gas detectors being of no great use unless you can almost guarantee a successful detection of the hazard is diluted with this British Standard. The confidence level and traceability of correct flame and gas detector coverage is boosted if the British Standard is implemented within industry.

1.2 Summary

This British Standard can be summarized as follows

- A guidance document which can be directly or indirectly applied to most industrial sectors
- A lifecycle approach ensuring the correct deployment of permanently installed flame and gas detectors
- Flame, hydrocarbon and toxic hazards are the prime targets for this British Standard
- Hazard and risk assessments are stressed as being the fundamental starting point for any application where flame and gas detectors are a requirement
- The choice of detector technology which can alter the results of a mapping study is simply explained
- Different mapping techniques are explained with simple examples given
- Competency of individuals throughout the lifecycle phase is stressed
- Hazards related to oxygen enrichment/deficiency is included as an annex
- A fully traceable and documented approach to flame and gas detector coverage

2 Main commentary

The structure of this British Standard supports a very simple and methodical approach towards hazard detection mapping as shown in Figure 1 of the standard. It should be noted that hazard detection within this British Standard is commonly cited in industry as fire and gas (F&G) mapping. The technical clauses (4 to 7) of this British Standard are largely based upon practices found in the oil and gas segments but can be applied to fit with most other industrial segments.

Due to additional complexities in some industrial segments, e.g. underground mining, this British Standard may not be fully applicable; however, some clauses remain useful, e.g. choice of sensing technologies (Clause 6).

This British Standard takes traditional manual methods of detector placement, merges these with engineering practices deployed by major international companies and defines modern day computer aided design processes to formulate a semi-automatic, transparent and traceable mapping result fully supported by a technical dossier.

Following the initial mandatory clauses of any British Standard the remaining clauses of the standard are summarized below.