

***IGEM/GM/7B Edition 2  
Communication 1804***

# ***Hazardous area classification for gas metering equipment***



*Founded 1863  
Royal Charter 1929  
Patron: Her Majesty the Queen*



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Communication 1804***

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## SECTION 1 : INTRODUCTION

1.1 IGEM/GM/7B Edition 2 supersedes IGEM/GM/7B Edition 1, Communication 1732, which is obsolete. This Standard is allied to IGEM/GM/7A Edition 2, Electrical connections for gas metering equipment, Communication 1803.

1.2 This Standard has been drafted by an Institution of Gas Engineers and Managers (IGEM) Panel, appointed by IGEM's Gas Measurement Committee, and has been approved by IGEM's Technical Co-ordinating Committee on behalf of the Council of IGEM.

1.3 This Standard has been written such that it complements the Supply Point Administration (SPAA) Codes of Practice (CoPs), the SPAA Meter Asset Managers Code of Practice (MAMCoP) and the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR).

As such, the Standard will be of use to gas suppliers, end users, shippers, gas transporters (GTs), meter asset managers (MAMs), installation contractors, equipment manufacturers and consultants.

The Standard will also be of assistance to designers and manufacturers when designing or specifying associated equipment for use in hazardous areas.

1.4 This Standard is not retrospective. However, where work needs to be undertaken on a meter installation, it is recommended that such an installation be brought into line with this Standard.

1.5 The de-regulation of the metering market led to a set of rules and Standards. This is managed through the SPAA MAMCoP Board and the associated MAMCoP, developed to cover whole life management of gas meter installations along with the Standards and guidance published by BSI and IGEM. The SPAA CoPs 1/a, 1/b and 1/c which cover the installation of the meter only, continue to apply. Businesses installing meter installations are required to be a SPAA Approved Meter Installer (AMI).

*Note: Under the arrangements, a SPAA approved MAM does not have to be an AMI, but has an obligation to use an AMI to install a meter.*

Notwithstanding Sub-Section 1.8, total compliance with IGEM/GM/7B is necessary for installations and modules where the meter installation has to comply with the SPAA MAMCoP, relevant scope.

1.6 This Standard has been updated, in part, due to the introduction of the updated IGEM/SR/25 Edition 2. This in turn was influenced by work carried out by the Health and Safety Laboratory (HSL), which used the concept contained within BS EN 60079-10-1 that small gas releases (even continuous) can give rise to zones of negligible extent, which do not result in a need for any special precautions regarding allowable equipment. This concept did not exist in IGE/SR/25 Edition 1, or IGEM/GM/7B Edition 1 – any potential release gave rise to a discrete zoned area, resulting in zones even around low pressure pipework in the open air.

Within BS EN 60079-10-1, the concept of a hypothetical volume ( $V_z$ ) associated with a gas release is discussed, within which the average gas concentration is 50% of the lower flammability limit (LFL). It is related to the gas release rate, the ventilation and the enclosure volume. If  $V_z$  is less than  $0.1 \text{ m}^3$ , a zone of negligible extent is deemed to exist. Provided the availability of ventilation is good, the area may be regarded in the same way as non-hazardous. Where availability of ventilation is less than good, or is not present virtually continuously, a discrete (not negligible extent) zoned area will usually result.

*Note: Further information about the HSL research work is available in the HSE report RR630.*

- 1.7 This Standard makes use of the terms “must”, “shall” and “should”, when prescribing particular requirements. Notwithstanding Sub-Section 1.10:
- the term “must” identifies a requirement by law in Great Britain (GB) at the time of publication
  - the term “shall” prescribes a requirement which, it is intended, will be complied with in full and without deviation
  - the term “should” prescribes a requirement which, it is intended, will be complied with unless, after prior consideration, deviation is considered to be acceptable.

Such terms may have different meanings when used in legislation, or Health and Safety Executive (HSE) Approved Codes of Practice (ACoPs) or guidance, and reference needs to be made to such statutory legislation or official guidance for information on legal obligations.

- 1.8 The primary responsibility for compliance with legal duties rests with the employer. The fact that certain employees, for example “responsible engineers”, are allowed to exercise their professional judgement does not allow employers to abrogate their primary responsibilities. Employers must:
- have done everything to ensure, so far as it is reasonably practicable, that “responsible engineers” have the skills, training, experience and personal qualities necessary for the proper exercise of professional judgement
  - have systems and procedures in place to ensure that the exercise of professional judgement by “responsible engineers” is subject to appropriate monitoring and review
  - not require “responsible engineers” to undertake tasks which would necessitate the exercise of professional judgement that is not within their competence. There should be written procedures defining the extent to which “responsible engineers” can exercise their professional judgement. When “responsible engineers” are asked to undertake tasks which deviate from this, they should refer the matter for higher review.

- 1.9 It is now widely accepted that the majority of accidents in industry generally are in some measure attributable to human as well as technical factors in the sense that actions by people initiated or contributed to the accidents, or people might have acted in a more appropriate manner to avert them.

It is therefore necessary to give proper consideration to the management of these human factors and the control of risk. To assist in this, it is recommended that due regard be paid to HSG48.

- 1.10 Notwithstanding Sub-Section 1.7, this Standard does not attempt to make the use of any method or specification obligatory against the judgement of the responsible engineer. Where new and better techniques are developed and proved, they should be adopted without waiting for modification to this Standard. Amendments to this Standard will be issued when necessary, and their publication will be announced in the Journal of IGEM and other publications as appropriate.

- 1.11 Requests for interpretation of this Standard in relation to matters within its scope, but not precisely covered by the current text, are to be addressed in writing to Technical Services, IGEM, IGEM House, High Street, Kegworth, Derbyshire DE74 2DA or by e-mail to [technical@igem.org.uk](mailto:technical@igem.org.uk) and will be submitted to the relevant Committee for consideration and advice, but in the context that the final responsibility is that of the engineer concerned. If any

advice is given by or on behalf of IGEM, this does not relieve the responsible engineer of any of his or her obligations.

1.12 This Standard was published in March 2018.

## SECTION 2 : SCOPE

2.1 This Standard covers hazardous area classification for gas metering equipment.

2.2 This Standard applies to liquid-free Natural Gas (NG) with a combined proportion of methane-plus-inerts of greater than 89% by volume; a gross calorific value not exceeding 45 MJ m<sup>-3</sup>; molecular weight not exceeding 20 kg kmol<sup>-1</sup>; lower flammability limit (LFL) of not less than 4.4%; a temperature range of -20°C to 50°C and gauge pressure not exceeding 100 bar. Ambient temperatures are assumed to be in the range of -20°C to 35°C.

*Note:* This Standard does not apply to either compressed or liquefied NG (CNG or LNG) vehicle filling station installations. Guidance on the latter is provided by IGEM/UP/20 and IGEM/UP/21 respectively or the Energy Institute (see Appendix 2, Section A2.6).

2.3 A zone of negligible extent is only applicable in this Standard to those installations of MOP not exceeding 10 bar.

2.4 This Standard applies to any potential release of NG except those that may be caused by catastrophic failure such as the rupture of a process vessel or pipeline, component failure and similar rare events that are not predictable.

2.5 This Standard applies to primary and secondary meter installations and associated volume conversion equipment and all associated electrical equipment and connections, in industrial and commercial premises and which have been installed to BS 6400-1, BS 6400-2, IGE/GM/4, IGEM/GM/6, IGEM/GM/8 and IGEM/GM/5, as appropriate. These installations will also need to have been tested to and comply with IGE/UP/1, IGE/UP/1A, IGEM/UP/1B, IGEM/UP/1C as appropriate. However, it does not apply in the following circumstances when it will be necessary to use IGEM/SR/25:

- ventilation is of the forced type
- creep relief vents terminate within a meter installation's housing
- a competent person considers there to be unusual site circumstances
- the installation is at a remote, unmanned, site
- it is considered that leaks may go undetected
- unodorised gas is metered.

*Note 1:* DSEAR does not apply to meter installations installed in domestic premises. Therefore, it is not intended that this Standard be used for hazardous area classification in such circumstances.

*For the purposes of this Standard, a meter installation in domestic premises is an installation within, or near to, a domestic dwelling into which the installation supplies gas and where it is reasonable to expect that the householder will be in the vicinity of the installation on a regular basis.*

*Note 2:* For the purposes of this Standard, a meter installation in industrial or commercial premises is an installation within the boundary of the premises within which the gas load is located and where it is reasonable to expect that passers-by will be in the vicinity of the gas installation on a regular basis. This is to distinguish this type of installation from a remote site, for example a National Transmission System above-ground installation where it is reasonable to expect that persons will not be present for long periods of time and when IGEM/SR/25 will need to be applied.

*Note 3:* Some commercial premises utilise domestic style installations and housings. This Standard is applicable to such installations.

2.6 This Standard may be applied for meter installations in existing premises where ventilation is present but where it is difficult or impossible to confirm that levels of ventilation comply with current design Standards.

- 2.7 This Standard uses a methodology that assumes meter installations are protected from external interference and located in populated areas, or sites are manned in industrial and commercial premises. Such conditions will lead to a high probability of detection of any gas leak and within a short time period. Where these conditions apply, such installations can be deemed to be visited (with reference to IGEM/SR/25) on a regular basis.
- 2.8 All pressures quoted are gauge pressures unless otherwise stated.
- 2.9 Italicised text is informative and does not represent formal requirements.
- 2.10 Appendices are informative and do not represent formal requirements unless specifically referenced in the main sections via the prescriptive terms “must”, “shall” or “should”.