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AS/NZS 60079.20.1:2012

Australian/New Zealand Standard™

Explosive atmospheres

Part 20.1: Material characteristics for gas and vapour classification—Test methods and data

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee MS-011, Classification of Hazardous Areas. It was approved on behalf of the Council of Standards Australia on 14 February 2012 and on behalf of the Council of Standards New Zealand on 31 January 2012.
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Australian Paint Manufacturers Federation
Australian Petroleum Production and Exploration Association
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We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee MS-011, Classification of Hazardous Areas.

This Standard forms the first edition of AS/NZS 60079.20.1 and it is intended to replace AS/NZS 60079.1.1:2002, *Electrical apparatus for explosive gas atmospheres—Flameproof enclosures 'd'—Method of test for ascertainment of maximum experimental safe gap,* AS/NZS 60079.4:2000 *Electrical apparatus for explosive gas atmospheres—Method of test for ignition temperature,* AS/NZS 60079.12:2000, *Electrical apparatus for explosive gas atmospheres—Classification of mixtures of gases or vapours with air according to their maximum experimental safe gaps and minimum igniting currents,* AS/NZS 60079.20:2000, *Electrical apparatus for explosive gas atmospheres—Data for flammable gases and vapours, relating to the use of electrical apparatus,* and its Amendment 1.

The objective of this Standard is to provide guidance on classification of gases and vapours. It describes a test method intended for the measurement of the maximum experimental safe gaps (MESG) for gas or vapour-air mixtures under normal conditions of temperature and pressure so as to permit the selection of an appropriate group of equipment. It describes also a test method intended for use in the determination of the auto-ignition temperature of a chemically pure vapour or gas in air at atmospheric pressure.

The tabulated values of chemical and engineering properties of substances are provided to assist engineers in their selection of equipment to be used in hazardous areas.

This Standard is identical with, and has been reproduced from IEC 60079-20-1, Ed.1.0 (2010), *Explosive atmospheres*—Part 20-1: *Material characteristics for gas and vapour classification—Test methods and data.*

As this Standard is reproduced from an International Standard, the following applies:

(a) Its number appears on the cover and title page while the International Standard number appears only on the cover.

(b) In the source text 'this part of IEC 60079' should read 'this Australian/New Zealand Standard'.

(c) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian or Australian/New Zealand Standards, as follows:

Reference to International Standard		*Australian/New Zealand Standard*	
IEC		AS/NZS	
60079	Explosive atmospheres	60079	Explosive atmospheres
60079-11	Part 11: Equipment protection by intrinsic safety "i"	60079.11	Part 11: Equipment protection by intrinsic safety 'i'
60079-14	Part 14: Electrical installations design, selection and erection	60079.14	Part 14: Electrical installations design, selection and erection

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annex to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

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Part 20.1:
Material characteristics for gas and vapour classification—Test methods and data

1 Scope

This part of IEC 60079 provides guidance on classification of gases and vapours. It describes a test method intended for the measurement of the maximum experimental safe gaps (MESG) for gas- or vapour-air mixtures under normal conditions of temperature[1] and pressure so as to permit the selection of an appropriate group of equipment. The method does not take into account the possible effects of obstacles on the safe gaps[2]. This standard describes also a test method intended for use in the determination of the auto-ignition temperature of a chemically pure vapour or gas in air at atmospheric pressure.

The tabulated values of chemical and engineering properties of substances are provided to assist engineers in their selection of equipment to be used in hazardous areas. It is hoped to publish further data from time to time, as the results of tests made in several countries become available.

The scope of these data has been selected with particular reference to the use of equipment in hazardous areas, and notice has been taken of standard measurement methods.

NOTE 1 The data in this standard have been taken from a number of references which are given in the bibliography.

NOTE 2 Some variations in the data may appear when references are compared, but usually the discrepancy is sufficiently small to be of no importance in the selection of equipment.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60079-11, *Explosive atmospheres – Part 11: Equipment protection by intrinsic safety "i"*

IEC 60079-14, *Explosive atmospheres – Part 14: Electrical installations design, selection and erection*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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1 An exception is made for substances with vapour pressures which are too low to permit mixtures of the required concentrations to be prepared at normal ambient temperatures. For these substances, a temperature 5 K above that needed to give the necessary vapour pressure or 50 K above the flash point is used.

2 The design of the test apparatus for safe gap determination, other than that used for selecting the appropriate group of enclosure for a particular gas, may need to be different to the one described in this standard. For example, the volume of the enclosure, flange width, gas concentrations and the distance between the flanges and any external wall or obstruction may have to be varied. As the design depends on the particular investigation which is to be undertaken, it is impracticable to recommend specific design requirements, but for most applications the general principles and precautions indicated in the clauses of this standard will still apply.