



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 3836.11-2022

**Explosive atmospheres - Part 11: Material characteristics for
gas and vapour classification - Test methods and data**

Issued on: October 12, 2022

Implemented on: May 1, 2023

Issued by: SAMR; SAC

Table of Contents

Foreword...	3
Introduction...	7
1 Scope...	10
2 Normative references...	10
3 Terms and definitions...	11
4 Classification of gases and vapours...	13
5 Data for flammable gases and vapours, relating to the use of equipment...	16
6 Method of test for the maximum experimental safe gap (MESG)...	18
7 Method of test for auto-ignition temperature (AIT)...	22

Foreword

This document was drafted in accordance with the rules given in GB/T 1.1-2020

"Directives for standardization - Part 1.Rules for the structure and drafting of standardizing documents".

This document is Part 11 of GB/T 3836 "Explosive atmospheres". The following parts of GB/T 3836 have been issued.

- Part 1.Equipment - General requirements
- Part 2.Equipment protection by flameproof enclosures "d"
- Part 3.Equipment protection by increased safety "e"
- Part 4.Equipment protection by intrinsic safety "i"
- Part 5.Equipment protection by pressurized enclosure "p"
- Part 6.Equipment protection by liquid immersion "o"
- Part 7.Equipment protection by powder filling "q"
- Part 8.Equipment protection by type of protection "n"
- Part 9.Equipment protection by encapsulation "m"
- Part 11.Material characteristics for gas and vapour classification - Test methods and data

- Part 12. Material characteristics for combustible dusts - Test methods
- Part 13. Equipment repair, overhaul, reclamation and modification
- Part 14. Classification of hazardous areas
- Part 15. Electrical installations design, selection and erection
- Part 16. Electrical installations inspection and maintenance
- Part 17. Equipment protection by pressurized room "p" and artificially ventilated room "v"
- Part 18. Intrinsically safe electrical systems
- Part 20. Equipment with equipment protection level (EPL) Ga
- Part 21. Application of quality management systems for Ex Product manufacture
- Part 22. Protection of equipment and transmission system using optical radiation
- Part 23. Group I, category EPL equipment intended to remain functional in atmospheres endangered by firedamp and/or coal dust
- Part 24. Equipment protection by special protection "s"
- Part 25. Requirements for process sealing between flammable process fluids and electrical systems
- Part 26. Electrostatic hazards - Guidance
- Part 27. Electrostatic hazards - Test
- Part 28. Non-electrical equipment for explosive atmospheres - Basic method and requirements
- Part 29. Non-electrical equipment for explosive atmospheres - Constructional safety "c", control of ignition source "b", liquid immersion "k"
- Part 30. Equipment and components in explosive atmospheres in underground mines
- Part 31. Equipment dust ignition protection by enclosure "t"
- Part 32. Intrinsically safe systems with electronically controlled spark duration limitation
- Part 33. Equipment in adverse service conditions

- Part 34.Equipment assemblies
- Part 35.Classification of areas for explosive dust atmospheres
- Part 36.Electrical safety devices for the control of potential ignition sources from Ex Equipment.

This document replaces GB/T 3836.11-2017 "Explosive atmospheres - Part 11. Material characteristics for gas and vapour classification - Test methods and data". Compared with GB/T 3836.11-2017, in addition to the structural adjustments and editorial changes, the main technical changes in this document are as follows.

- the range that needs to simultaneously determine the maximum test safety gap and the minimum ignition current ratio is changed (see 4.2, 4.3 of this Edition, 4.4 of Edition 2017);
- cases where classification should not be based on similarity in chemical structure are added (see 4.4 of this Edition);
- the requirements for the short-circuit current of the ignition device and the requirements for the spark discharge time are added (see 6.3.4 of this Edition);
- the requirements for the autoignition temperature test device are changed (see 7.2 of this Edition, 7.2 of Edition 2017);
- the sampling, preparation and storage requirements for auto-ignition temperature test specimens are added (see 7.3 of this Edition);
- the procedures for auto-ignition temperature test are changed (see 7.4 of this Edition, 7.3 of Edition 2017);
- the criterion for the validity of auto-ignition temperature test results is changed (see

7.6 of this Edition, 7.5 of Edition 2017);

- the requirements for test record data are changed (see 7.7 of this Edition, 7.6 of Edition 2017).

This document identically adopts ISO/IEC 80079-20-1:2017 "Explosive atmospheres - Part 20-1.Material characteristics for gas and vapour classification - Test methods and data".

The following minimal editorial changes have been made to this document.

- to coordinate with existing standards, the name of the standard is changed to "Explosive atmospheres - Part 11. Material characteristics for gas and vapour classification - Test methods and data";
- the molecular formulas for substances with CAS numbers as 98-01-1, 100-40-3, 103-11-7, 106-58-1, 106-92-3, 108-89-4, 106-96-7, 111-43-3, 123-63-7, 142-29-0, 151-56-4, 291-64-5, 1738-25-6, 2426-08-6 are corrected;
- the description of X and Y in Figure D.1 is corrected;
- the technical corrigenda of ISO/IEC 80079-20-1:2017/COR1:2018 are incorporated. The position of the outer margin of the clause involved is marked with a vertical double line (||);
- Bibliography is modified.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The issuing authority shall not be held responsible for identifying any or all such patent rights.

This document was proposed by China Electrical Equipment Industry Association.

This document shall be under the jurisdiction of National Technical Committee on Explosion-proof Electrical Equipment of Standardization Administration of China (SAC/TC 9).

The drafting organizations of this document. Nanyang Explosion-Proof Electric Research Institute Co., Ltd., Harbin Institute of Technology, Shanghai Instrument and Meter Automatic Control System Inspection and Testing Institute Co., Ltd., Henan Emergency Management Science and Technology Research Institute, Xuzhou Inspection and Testing Center, New Liming Technology Co., Ltd., Henan Shenma Aidi An Chemical Co., Ltd.

Main drafters of this document. Zhang Gang, Liu Jian, Wang Qiaoli, Qian Song, Chen Renshu, Yu Yanjuan, Zhang Peng, Zheng Zhenxiao, Sui Guohui, Sun Zhaojun, Lyu Xiaodong, Fan Songkai.