

One or more corrigenda exist with corrections to this document.  
These can be searched online and ordered free of charge at [www.beuth.de](http://www.beuth.de)

This page is intentionally blank.

**DIN EN ISO/IEC 80079-20-2****DIN**

ICS 13.230

Supersedes  
DIN EN 61241-2-2  
(VDE  
0170/0171-15-2-2):1996-04

**Explosive atmospheres –  
Part 20-2: Material characteristics –  
Combustible dusts test methods (ISO/IEC 80079-20-2:2016);  
English version EN ISO/IEC 80079-20-2:2016,  
English translation of DIN EN ISO/IEC 80079-20-2:2016-12**

Explosionsfähige Atmosphären –  
Teil 20-2: Werkstoffeigenschaften –  
Prüfverfahren für brennbare Stäube (ISO/IEC 80079-20-2:2016);  
Englische Fassung EN ISO/IEC 80079-20-2:2016,  
Englische Übersetzung von DIN EN ISO/IEC 80079-20-2:2016-12

Atmosphères explosives –  
Partie 20-2: Caractéristiques des produits –  
Méthodes d'essai des poussières combustibles (ISO/IEC 80079-20-2:2016);  
Version anglaise EN ISO/IEC 80079-20-2:2016,  
Traduction anglaise de DIN EN ISO/IEC 80079-20-2:2016-12

Document comprises 52 pages

Translation by DIN-Sprachendienst.

In case of doubt, the German-language original shall be considered authoritative.

*A comma is used as the decimal marker.*

## **Start of application**

The start of application of this standard is 2016-12-01.

## **National foreword**

This document (EN ISO/IEC 80079-20-2:2016) has been prepared by Technical Committee IEC/TC 31 "Equipment for explosive atmospheres" in collaboration with Technical Committee CEN/TC 305 "Potentially explosive atmospheres — Explosion prevention and protection" (Secretariat: DIN, Germany).

This standard includes safety requirements.

The responsible German body involved in its preparation was *DIN-Normenausschuss Sicherheitstechnische Grundsätze* (DIN Standards Committee Safety Design Principles), Working Committee NA 095-02-09 AA *Kenngrößen für Stäube, Gase und Dämpfe*.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. DIN [and/or DKE] shall not be held responsible for identifying any or all such patent rights.

## **Amendments**

This standard differs from DIN EN 61241-2-2 (VDE 0170/0171-15-2-2):1996-04 as follows:

- a) the test specified in DIN EN 61241-2-2 (VDE 0170/0171-15-2-2):1996-04 has been included in the test scheme of DIN EN ISO/IEC 80079-20-2:2016;
- b) the calculation  $R_0 < 10 R_S$  has been deleted;
- c) values of d.c. voltage have been reduced to three values;
- d) the wording has been revised.

## **Previous editions**

DIN EN 61241-2-2 (VDE 0170/0171-15-2-2): 1996-04

EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

EN ISO/IEC 80079-20-2

March 2016

ICS 29.260.20

Supersedes EN 61241-2-2:1995

English Version

Explosive atmospheres - Part 20-2: Material  
characteristics - Combustible dusts test methods  
(ISO/IEC 80079-20-2:2016)

Atmosphères explosives - Partie 20-2: Caractéristiques  
des produits - Méthodes d'essai des poussières  
combustibles (ISO/IEC 80079-20-2:2016)

Explosionsfähige Atmosphären - Teil 20-2:  
Werkstoffeigenschaften - Prüfverfahren für brennbare  
Stäube (ISO/IEC 80079-20-2:2016)

This European Standard was approved by CEN on 18 February 2016.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

## CONTENTS

European foreword .....	5
FOREWORD .....	6
1 Scope .....	9
2 Normative references .....	9
3 Terms and definitions .....	9
4 Dust sample requirements .....	10
4.1 Receipt of sample for testing .....	10
4.2 Characterisation of sample .....	10
4.3 Preparation of sample .....	11
4.4 Test conditions .....	11
5 Combustible dusts and combustible flyings determination .....	11
5.1 Test sequence .....	11
5.2 Tests to determine whether material is a combustible dust or combustible flying .....	11
5.2.1 Visual inspection .....	11
5.2.2 Determine particle distribution .....	12
5.2.3 Ignition test in the Hartmann tube .....	12
5.2.4 Ignition test in the 20-litre sphere .....	12
6 Procedure for characterisation of combustible dust or combustible flying .....	12
7 Test methods for determination of whether a material is a combustible dust or a combustible flying .....	15
7.1 Modified Hartmann tube .....	15
7.1.1 General .....	15
7.1.2 Test equipment .....	15
7.1.3 Test procedure .....	16
7.2 20-litre sphere .....	16
7.2.1 General .....	16
7.2.2 Test equipment .....	16
7.2.3 Test procedure .....	17
7.3 Alternative method to 20-litre sphere for small test material quantities .....	17
7.3.1 General .....	17
7.3.2 Test equipment .....	18
7.3.3 Test procedure .....	18
8 Test methods for combustible dust determinations .....	18
8.1 MIT of a dust cloud .....	18
8.1.1 General .....	18
8.1.2 GG furnace .....	18
8.1.3 BAM furnace .....	19
8.2 Test for MIT of dust layer .....	20
8.2.1 General .....	20
8.2.2 Heated surface .....	20
8.2.3 Dust layers .....	21
8.2.4 Dust layer temperature .....	21
8.2.5 Ambient temperature measurements .....	21
8.2.6 Dust layer temperature test method .....	21
8.2.7 Recording of results .....	22

8.3	Method for determining minimum ignition energy of dust/air mixtures .....	23
8.3.1	General .....	23
8.3.2	Test equipment .....	23
8.3.3	Test procedure.....	24
8.3.4	Calibration for determination of minimum ignition energies (MIE) by electrically generated high-voltage d.c. sparks.....	25
8.3.5	Recording of test results .....	25
8.4	Test on resistivity .....	25
8.4.1	General .....	25
8.4.2	Test equipment .....	26
8.4.3	Test procedure.....	26
8.4.4	Recording of test results .....	27
9	Test report.....	27
Annex A (normative)	Measurement of temperature distribution on the surface of the hot plate .....	28
Annex B (informative)	Godbert-Greenwald oven (GG).....	29
Annex C (informative)	Examples of spark-generating systems .....	30
C.1	General.....	30
C.2	Triggering by auxiliary spark using three-electrode system.....	31
C.3	Triggering by electrode movement.....	32
C.4	Triggering by voltage increase (trickle-charging circuit) .....	33
C.5	Triggering by auxiliary spark, using normal two-electrode system – Trigger transformer in discharge circuit.....	34
Annex D (normative)	Vertical tube (modified Hartmann tube) apparatus .....	35
Annex E (informative)	20-litre sphere .....	36
Annex F (informative)	BAM oven .....	38
Annex G (informative)	Data for dust explosion characteristics .....	39
Annex H (informative)	1 m <sup>3</sup> vessel .....	40
H.1	Test principle .....	40
H.2	Test apparatus .....	40
H.3	Test conditions.....	44
H.4	Test procedure.....	44
Annex ZA (informative)	Relationship between this European Standard and the Essential Requirements of EU Directive 2014/34/EU.....	46
Annex ZB (informative)	Significant changes with respect to IEC 61241-2-1:1994, EN 61241-2-2:1993 and IEC 61241-2-3:1994 .....	47
Bibliography	.....	50