

DIN EN ISO/IEC 80079-20-2:2016-12 (E)

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

| Contents | Page |
|---|-------------|
| 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 ³ 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 |