

DIN EN 15947-4:2022-12 (E)

Pyrotechnic articles - Fireworks, Categories F1, F2 and F3 - Part 4: Test methods

| Contents | | Page |
|-------------------------|--|-------------|
| European foreword | | 4 |
| 1 | Scope | 6 |
| 2 | Normative references | 6 |
| 3 | Terms and definitions | 6 |
| 4 | Test environment | 6 |
| 4.1 | General | 6 |
| 4.2 | Indoor | 6 |
| 4.3 | Outdoor | 7 |
| 4.3.1 | General | 7 |
| 4.3.2 | Category F1 | 7 |
| 4.3.3 | Category F2 | 7 |
| 4.3.4 | Category F3 | 7 |
| 4.4 | Monitoring height | 7 |
| 5 | Apparatus | 7 |
| 6 | Methods of tests | 12 |
| 6.1 | Construction and stability | 12 |
| 6.1.1 | Length of handle | 12 |
| 6.1.2 | Attachment of separate handle or separate base | 13 |
| 6.1.3 | Length of item | 13 |
| 6.1.4 | Length of pull-string or pull-strip | 14 |
| 6.1.5 | Determination of diameter | 14 |
| 6.1.6 | Attachment of initial fuse | 14 |
| 6.1.7 | Resistance to ignition by an abrasive surface | 14 |
| 6.1.8 | Breakability of end closures | 15 |
| 6.2 | Design - Verification | 15 |
| 6.2.1 | General | 15 |
| 6.2.2 | Conformity to drawings and part lists | 15 |
| 6.2.3 | Determination of net explosive content | 16 |
| 6.3 | Paper tests | 17 |
| 6.3.1 | Test for burning or incandescent matter | 17 |
| 6.3.2 | Test for horizontally projected debris | 18 |
| 6.3.3 | Test for vertically projected debris | 20 |
| 6.4 | Angle of ascent and height of explosion | 21 |
| 6.4.1 | Apparatus | 21 |
| 6.4.2 | Procedure for double banger | 22 |
| 6.4.3 | Procedure for items other than double banger | 22 |
| 6.5 | Measurement of sound pressure level | 22 |
| 6.5.1 | General measurement for outdoors | 22 |
| 6.5.2 | Party popper | 23 |
| 6.5.3 | Christmas cracker and snap for indoors | 24 |
| 6.6 | Time measurement | 25 |
| 6.6.1 | Apparatus | 25 |
| 6.6.2 | Procedure | 25 |
| 6.7 | Measuring of labelling | 25 |
| 6.7.1 | Apparatus | 25 |
| 6.7.2 | Procedure | 25 |

| | | |
|--|---------------------------------------|--------|
| 6.8 | Extinguishing of flames | 26 |
| 6.8.1 | Apparatus | 26 |
| 6.8.2 | Procedure | 26 |
| 6.9 | Burning rate of composition | 26 |
| 6.9.1 | Apparatus | 26 |
| 6.9.2 | Procedure | 26 |
| 6.10 | Droop test | 26 |
| 6.10.1 | Apparatus | 26 |
| 6.10.2 | Procedure | 26 |
| 6.11 | Projected debris (outdoor) | 26 |
| 6.11.1 | Apparatus | 26 |
| 6.11.2 | Procedure | 26 |
| 6.12 | Incandescent matter | 27 |
| 6.13 | Visual and audible examinations | 27 |
| 6.14 | Mechanical conditioning | 27 |
| 6.14.1 | Apparatus | 27 |
| 6.14.2 | Procedure | 27 |
| 6.15 | Thermal conditioning | 28 |
| 6.15.1 | Apparatus | 28 |
| 6.15.2 | Procedure | 28 |
| 6.16 | Striking surface test | 28 |
| 6.16.1 | Apparatus | 28 |
| 6.16.2 | Procedure | 28 |
| 6.17 | Function test | 28 |
| 6.17.1 | Apparatus | 28 |
| 6.17.2 | Procedure | 28 |
| 6.18 | Determination of tube angle | 29 |
| 6.18.1 | Apparatus | 29 |
| 6.18.2 | Procedure | 29 |
| Annex A (informative) Mechanical conditioning (shock apparatus) | | 30 |
| Annex B (normative) Determination of silver fulminate | | 33 |
| B.1 | Reagents | 33 |
| B.2 | Apparatus | 33 |
| B.3 | Procedure | 33 |
| Annex ZA (informative) Relationship between this European Standard and the essential safety requirements of Directive 2013/29/EU aimed to be covered | | 35 |
| Bibliography | | 36 |