

DIN EN 15947-4:2010-12 (E)

Pyrotechnic articles - Fireworks, Categories 1, 2, and 3 - Part 4: Test methods

Contents	Page
Foreword	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Test environment	5
4.1 General	5
4.2 Indoor	5
4.3 Outdoor	6
4.3.1 General	6
4.3.2 Category 1	6
4.3.3 Category 2	6
4.3.4 Category 3	6
4.4 Monitoring height	6
5 Apparatus	6
6 Methods of tests	11
6.1 Construction and stability	11
6.1.1 Length of handle	11
6.1.2 Attachment of separate handle	12
6.1.3 Length of item	12
6.1.4 Length of pull-string or pull-strip	13
6.1.5 Determination of diameter	13
6.1.6 Attachment of initial fuse	13
6.1.7 Attachment of sealing paper, ignition head or friction head	13
6.1.8 Resistance to ignition by an abrasive surface	14
6.1.9 Height of initial fuse for mounted wheels in category 3	14
6.2 Design - Verification	14
6.2.1 General	14
6.2.2 Conformity to drawings and part lists	14
6.2.3 Pyrotechnic composition - Determination of net explosive content	14
6.3 Paper tests	15
6.3.1 Test for burning or incandescent matter	15
6.3.2 Test for horizontal projected debris	16
6.3.3 Test for vertical projected debris	18
6.4 Angle of ascent and height of effects	21
6.4.1 Apparatus	21
6.4.2 Procedure for double bangers	21
6.4.3 Procedure for items other than double bangers	21
6.5 Measurement of sound pressure level	21
6.5.1 General measurement for outdoors	21
6.5.2 Party poppers for indoors	22
6.5.3 Christmas crackers and snaps for indoors	23
6.6 Timing measurement	24
6.6.1 Apparatus	24
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	25
6.8.1	Apparatus	25
6.8.2	Procedure	25
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	26
6.13	Visual and audible examinations	26
6.14	Mechanical conditioning	27
6.14.1	Apparatus	27
6.14.2	Procedure	27
6.15	Thermal conditioning	27
6.15.1	Apparatus	27
6.15.2	Procedure (option 1)	27
6.15.3	Procedure (option 2)	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 (informative) Determination of silver fulminate		36
Annex ZA (informative) Relationship between this European Standard and the Essential Requirements of EU Directive 2007/23/EC on the placing on the market of pyrotechnic articles		38
Bibliography		39