BRITISH STANDARD

BS 7114-1:
1988

Fireworks —

Part 1: Classification of fireworks

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Chemicals Standards Committee (CIC/-) to Technical Committee CIC/47, upon which the following bodies were represented:

British Pyrotechnists' Association
British Toy and Hobby Manufacturers' Association Ltd.
Chief and Assistant Chief Fire Officers' Association
Child Accident Prevention Trust
Confederation of British Industry
Consumer Policy Committee of BSI
Department of Trade and Industry (Consumer Safety Unit, CA Division)
Health and Safety Executive
Home Office
Institute of Explosives Engineers
Institute of Trading Standards Administration
Loss Prevention Council
National Association of Toy Distributors
National Association of Toy Retailers
Royal Society for the Prevention of Accidents
Scout Association

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Contents

Foreword

This Part of BS 7114 has been prepared under the direction of the Chemicals Standards Committee.

BS 7114 has been prepared in order to specify certain basic requirements for the construction and performance of fireworks (as well as describing an associated classification system and methods of test) which will help to ensure that the risks of injury to users, onlookers and the public in general and of damage to property are minimized. It also includes requirements for labelling in order to encourage the proper use of fireworks. Prior to the publication of BS 7114 there had been no comprehensive document published in the United Kingdom concerned with the quality of fireworks, although fireworks are subject to certain legislation, notably the Explosives Act 1875 and the Fireworks Act 1951, and to voluntary agreements between Government departments and the industry.

BS 7114 is issued in three Parts as follows:

— *Part 1: Classification of fireworks;*

— *Part 2: Specification for fireworks;*

— *Part 3: Methods of test for fireworks.*

The main purpose of this Part of BS 7114 is to provide the classification of fireworks which is used as the basis of the requirements specified in Part 2 and the methods of test described in Part 3. It also defines various terms which appear in one or more of the Parts of BS 7114.

Attention is drawn to the United Nations classification scheme, published in the "Recommendations on the Transport of Dangerous Goods", in which products as packaged for transport are assigned to a class and division dependent on the hazard they present.

Information and guidance on the classification and marking of fireworks which are outside the scopes of BS 7114-2 and BS 7114-3 are given in Appendix C.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations. In particular, attention is drawn to the Explosives Act 1875 and Order in Council 15, the Explosives Act 1923, the Fireworks Act 1951, the Health and Safety at Work etc. Act 1974 and the Consumer Protection Act 1987.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 7114 establishes a system for the classification of fireworks. It also defines various terms used in BS 7114. It is applicable to fireworks for consumer use or public display, both indoors and outdoors.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions

For the purposes of BS 7114 the following definitions apply.

NOTE An alphabetical index to these terms is given in Appendix A.

2.1
firework

a device containing explosive composition which, upon functioning, will burn and/or explode to produce a visual or aural effect, or a combination of such effects, intended as a form of entertainment

NOTE Specialized technical devices such as signal flares, military devices and many theatrical devices are excluded by this definition.

2.2
explosive composition

a substance or mixture of substances which is designed, on ignition or initiation, to produce an aural and/or visual effect and/or to evolve gas

2.3
fuse

a component of a firework which is intended to transmit ignition from one part of a firework to another, with or without a delay

2.4
initial fuse

a fuse which is ignited in order to start the firework functioning

2.5
firework case

a container which is designed to retain all the explosive composition of a firework excluding the initial fuse

2.6
end closure

a disc, plate, plug or crimp which is designed to seal one end of a firework case

2.7
pyrotechnic unit

a discrete unit which is assembled into a firework case and which, upon functioning, will burn or explode to produce a visual and/or aural effect as part of a combination of effects produced by the firework

2.8
propellant charge

explosive composition which will burn to evolve gas which, in turn, is intended to propel the firework as a whole or to expel one or more pyrotechnic units without bursting the firework case

2.9
burster

explosive composition which will burn to evolve gas which in turn is intended to burst open the firework case, in order to expel one or more pyrotechnic units

2.10
gunpowder

explosive composition which is an intimate mixture of carbon and either potassium nitrate or sodium nitrate, or a similar mixture also containing sulphur

2.11
net explosive content

the mass of explosive composition in the firework

2.12
functioning point

the position in the test area where the firework is placed at the beginning of a performance test

2.13
principal effect

any of the effects listed in this Part of BS 7114 for the particular type of firework

2.14
first principal effect

the principal effect of a firework which is the first actually to occur during the functioning of the firework

2.15
initial fuse burning

burning which immediately follows ignition and precedes any other effect

2.16
invisible burning

burning occurring within the firework which is not visible to the person who ignited the firework

2.17
explosion

a sudden release of energy accompanied by a flash and/or a report

2.18
debris

any part of the firework which remains after the firework has finished functioning

2.19
communication

the inadvertent ignition or initiation of one or more fireworks by another firework in the same package or strip

2.20
amorce

a cap which comprises a paper envelope containing explosive composition and forms part of a roll

2.21
leading tape

the section of a roll of amorces, at its outermost end, which does not contain any dots of explosive composition

2.22
plastics encapsulated cap

a cap in which the explosive composition is completely enclosed in a plastics material

2.23
plastics cup type cap

a cap which comprises a plastics cup containing explosive composition with a sealing disc

2.24
composition length

the length of the section of a sparkler wire which is coated with explosive composition

2.25
vertical droop

the ratio of the distance by which the tip of a sparkler has been deflected from the horizontal, after the sparkler ceases to burn, to the composition length, expressed as a percentage

2.26
defect

a fault or malfunction of a firework

2.27
critical defect

a defect that judgement and experience indicate is likely to result in hazardous or unsafe conditions

2.28
major defect

a defect, other than a critical defect, which is likely to result in failure, to reduce materially the usability of the firework, or to increase the potential hazard

2.29
minor defect

a defect that is not likely to reduce materially the usability of the firework

2.30
defective

a firework or a primary pack with one or more defects

2.31
critical defective

a defective with one or more critical defects, with or without major or minor defects

2.32
major defective

a defective with one or more major defects, with or without minor defects, but with no critical defects

2.33
minor defective

a defective with one or more minor defects, but with no critical defects or major defects

2.34
acceptable quality level (AQL)

the maximum percentage defective that, for purposes of sampling inspection, can be considered satisfactory as a process average

2.35
primary pack

a package of fireworks of the same category and type, offered for retail sale as a single unit

2.36
selection pack

a package of fireworks of more than one type, in one or more categories, offered for retail sale as a single unit

NOTE A selection pack may contain primary packs as well as individual fireworks.

2.37
ancillary equipment

any device which does not form part of a firework but which is supplied with the firework and is required in order that the firework may function correctly when used in accordance with the instructions

2.38
rocket launcher

a tube, frame or base from which a rocket may be launched

2.39
portfire

a hand-held device containing slow-burning explosive composition which will emit a small flame

3 Classification

Fireworks for sale to the general public are classified into the following three categories based on their intended use:

category 1 : fireworks suitable for use inside domestic buildings;

category 2 : fireworks suitable for outdoor use in relatively confined areas;

category 3 : fireworks suitable for outdoor use in large open spaces.

Further explanation of categories 1, 2 and 3 is given in Appendix B.

Each of categories 1, 2 and 3 is divided into several different types each of which produces a principal effect or combination of such effects, as described in Table 1 to Table 3.

Fireworks which are incomplete and/or which are not intended for sale to the general public are classified as category 4.

NOTE 1 Category 4 fireworks are not covered in Part 2 and Part 3 of BS 7114. However, some information and guidance on the further classification of category 4 fireworks and on the marking of such fireworks are given in Appendix C.

NOTE 2 Category 4 fireworks may be subject to particular legal requirements regarding acquisition, storage and use which are different from, or additional to, those which apply to categories 1, 2 and 3. Further information may be obtained from the Health and Safety Executive, Explosives Unit, Magdalen House, Stanley Precinct, Bootle, Merseyside L20 3QZ.

Table 1 — Category 1 fireworks

Type	Type name	Description	Principal effect(s)
1A	Cap	Dot of impact-sensitive explosive composition contained in a nonmetallic envelope	Report
1B	Smoke device	Preformed shape of explosive composition or an integral container of explosive composition	Emission of smoke
1C	Party popper	Hand-held device operated by a pull-string	Ejection of streamers or confetti with a report
1D	Table bomb	Device operated by igniting a fuse	Ejection of streamers and/or novelties with a report
1E	Throwdown	A device containing an impact-sensitive explosive composition	Report, when thrown
1F	Novelty match	Hand-held device ignited by friction	Report and/or visual effect
1G	Non-hand-held sparkler	Wire partially coated with explosive composition and designed to be free-standing or to be fixed to a base	Emission of sparks
1H	Hand-held sparkler	Wire coated along one end with explosive composition and designed to be held in the hand	Emission of sparks
1J	Cracker snap	Two overlapping strips of card or paper with a friction-sensitive explosive composition in sliding contact with an abrasive surface	Report, when device is pulled apart
1K	Serpent	Preformed shape of explosive composition or an integral container of explosive composition	Emission of expanded residue

Table 2 — Category 2 fireworks

Type	Type name	Description	Principal effect(s)
2A	Banger	Single tube containing gunpowder	Report
2B	Fountain	Single tube containing explosive composition	Emission of sparks and flames, with aural effect other than report or without any aural effect
2C	Roman Candle	Single tube containing alternate pyrotechnic unit(s) and propellant charge(s)	Ejection of a pyrotechnic unit, or several units in succession, producing a visual and/or aural effect, or a series of such effects, remote from the firework case
2D	Mine	Device fired on the ground, containing a single propellant charge and pyrotechnic units	Ejection of all the pyrotechnic units in a single burst producing a widely dispersed visual and/or aural effect
2E	Wheel	Device which is designed to rotate about a fixed point	Rotation, emission of sparks and flames, with or without aural effect
2F	Rocket	Self-propelled device, with stick(s) for stabilization of flight	Ascent, which can be followed by report and/or ejection of pyrotechnic units producing a visual and/or aural effect
2G	Non-hand-held sparkler	Wire partially coated with explosive composition and designed to be free-standing, or to be fixed to a support, or to be fixed in the ground	Emission of sparks
2H	Hand-held sparkler	Wire coated along one end with explosive composition and designed to be held in the hand	Emission of sparks
2X	Combination	Assembly including several elements each corresponding to one of the devices listed under 2A to 2G, in any combination, with a single point of ignition	As for the individual elements

Table 3 — Category 3 fireworks

Type	Type name	Description	Principal effect(s)
3A	Banger	Single tube containing explosive composition	Report
3B	Fountain	Single tube containing explosive composition	Emission of sparks and flames, with aural effect other than report or without any aural effect
3C	Roman Candle	Single tube containing alternate pyrotechnic unit(s) and propellant charge(s)	Ejection of a pyrotechnic unit, or several units in succession, producing a visual and/or aural effect, or a series of such effects, remote from the firework case
3D	Mine	Device fired on the ground, containing a single propellant charge and pyrotechnic units	Ejection of all the pyrotechnic units in a single burst producing a widely dispersed visual and/or aural effect
3E	Wheel	Device which is designed to rotate about a fixed point	Rotation, emission of sparks and flames, with or without aural effect
3F	Rocket	Self-propelled device, with stick(s) and/or fin(s) for stabilization of flight	Ascent, which can be followed by report and/or ejection of pyrotechnic units producing a visual and/or aural effect
3G	Non-hand-held sparkler	Wire partially coated with explosive composition and designed to be free-standing, or to be fixed to a support, or to be fixed in the ground	Emission of sparks
3H	Shell	Device designed to be projected from a mortar tube and containing propellant charge, delay fuse, burster and pyrotechnic unit(s)	Projection, bursting of the firework case and ejection of the pyrotechnic unit(s) producing a visual and/or aural effect
3J	Shell-in-mortar	Assembly comprising a shell inside a tube, from which the shell is designed to be projected, with the initial fuse fixed so that it connects with the outside of the tube	Projection of the shell, bursting of its case and ejection of the pyrotechnic unit(s) producing a visual and/or aural effect
3X	Combination	Assembly including several elements each corresponding to one of the devices listed under 3A to 3J, in any combination, with a single point of ignition	As for the individual elements

Appendix A Index to terms defined in clause 2

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Appendix B Explanatory notes on categories 1, 2 and 3

B.1 Category 1

When used according to the instructions, these fireworks should not cause injury to people standing 1 m or more away and should not cause damage to property. In the case of hand-held fireworks, the person holding them should not be injured.

B.2 Category 2

When used according to the instructions, these fireworks should not cause injury to people standing 5 m or more away. In the case of hand-held sparklers, the person holding them should not be injured by the dropping of hot slag or the ejection of sparks. The fuse fitted to the fireworks should enable the person lighting the firework to retire safely to a distance of at least 5 m.

B.3 Category 3

When used according to the instructions, these fireworks should not cause injury to people standing 25 m or more away. People firing these fireworks would be expected to wear suitable personal protection.

Appendix C Information and guidance on the classification and marking of category 4 fireworks

C.1 Classification

The fireworks are divided into types as described in Table 4.

C.2 Marking

It is recommended that the fireworks are marked with the warning

"THIS DEVICE MUST NOT BE SOLD TO, OR USED BY, A MEMBER OF THE GENERAL PUBLIC."

A reference to any Part of BS 7114 should not be marked on or in relation to a category 4 firework.

Table 4 — Category 4 fireworks

Type	Type name	Description	Principal effect(s)
4A	Banger	Single tube containing explosive composition	Report
4B	Fountain	Single tube containing explosive composition	Emission of sparks and flames, with aural effect other than report or without any aural effect
4C	Roman Candle	Single tube containing alternate pyrotechnic unit(s) and propellant charge(s)	Ejection of a pyrotechnic unit, or several units in succession, producing a visual and/or aural effect, or a series of such effects, remote from the firework case
4D	Mine	Device fired on the ground, containing a single propellant charge and pyrotechnic units	Ejection of all the pyrotechnic units in a single burst producing a widely dispersed visual and/or aural effect
4E	Wheel	Device which is designed to rotate about a fixed point	Rotation, emission of sparks and flames, with or without aural effect
4F	Rocket	Self-propelled device, with stick(s) and/or fin(s) for stabilization of flight	Ascent, which can be followed by report and/or ejection of pyrotechnic units producing a visual and/or aural effect
4G	Spinner	Self-propelled device, designed to spin in flight	Rotation, ascent, emission of sparks and flames, with or without aural effect
4H	Shell	Device designed to be projected from a mortar tube and containing propellant charge, delay fuse, burster and pyrotechnic unit(s)	Projection, bursting of the firework case and ejection of the pyrotechnic unit(s) producing a visual and/or aural effect
4X	Combination	Assembly including several elements each corresponding to one of the devices listed under 4A to 4H, in any combination, with a single point of ignition	As for the individual elements

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Publications referred to

BS 7114, *Fireworks.*
BS 7114-2, *Specification for fireworks.*
BS 7114-3, *Methods of test for fireworks.*
Recommendations on the Transport of Dangerous Goods, United Nations[1) 2)].

[1)] Referred to in foreword only.

[2)] Available from HMSO, 49 High Holborn, London WC1, for personal callers, or by post from HMSO, PO Box 276, London SW8 5DT.

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