PUBLISHED DOCUMENT

PD CEN/TR
15952:2009

Pyrotechnic articles — Theatrical pyrotechnic articles, categories T1 and T2 — Overview of harmonized standards that will be developed by CEN/TC 212/WG 3

ICS 71.100.30

BSI
British Standards

National foreword

This Published Document is the UK implementation of CEN/TR 15952:2009.

The UK participation in its preparation was entrusted to Technical Committee CII/47, Pyrotechnic articles.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 December 2009

ISBN 978 0 580 67605 5

Amendments/corrigenda issued since publication

Date	Comments

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN/TR 15952

October 2009

ICS 71.100.30

English Version

Pyrotechnic articles - Theatrical pyrotechnic articles, categories T1 and T2 - Overview of harmonized standards that will be developed by CEN/TC 212/WG 3

Articles pyrotechniques - Articles pyrotechniques pour le théâtre - Vue d'ensemble du programme pour le développement de normes européenne

Pyrotechnische Gegenstände - Pyrotechnische Gegenstände für Bühne und Theater, Kategorien T1 und T2 - Überblick über harmonisierte Normen, die von CEN/TC 212/WG 3 erarbeitet werden

This Technical Report was approved by CEN on 17 August 2009. It has been drawn up by the Technical Committee CEN/TC 212.

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

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. CEN/TR 15952:2009: E

Contents

Page

Foreword

This document (CEN/TR 15952:2009) has been prepared by Technical Committee CEN/TC 212 “Pyrotechnic articles”, the secretariat of which is held by NEN.

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

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

Introduction

This Technical Report gives an overview of the work carried out by CEN/TC 212 WG 3, Theatrical Pyrotechnic Articles T1 and T2 within the first year of appointment (2008) and to provide a basis for future work, in order to write the standards for Theatrical Pyrotechnic Articles.

Work on developing harmonized Standards for T1 and T2 theatrical pyrotechnic articles will begin in early 2009.

Several features described in this report of the Harmonized Standards are expected to be changed during the Standards development phase. However the overall philosophy of the WG3 working group is expected to be retained.

Directive 2007/23/EC on the placing on the market of pyrotechnic articles, was published on June 14 2007 in the Official Journal of the European Union. Annex 1 of the Directive 2007/23/EC gives the essential safety requirements (ESRs) which apply to pyrotechnic articles. In order to facilitate the process of demonstrating compliance with these ESR, harmonized standards for the design, manufacture and testing of pyrotechnic articles must be developed. CEN has been mandated by the European Commission (EC) to develop these harmonized standards: Mandate M 416 describes the work that CEN shall perform.

During the October 16/17 2007 meeting in Delft, CEN/TC 212 agreed to share the corresponding work to be done between several Working Groups and hence Working Group 3 (WG3) has been established to develop Harmonized Standards for T1 and T2 pyrotechnic articles.

1 Scope

This document gives a description of the context regarding the situation of theatrical pyrotechnic articles and their consideration within the Directive 2007/23/EC with the aim to define what harmonized standards shall be developed in order to comply with the essential safety requirements of the Annex 1 of the Directive.

2 Terminology for this Report

The following terms are used in this document. Note that these are not necessarily terms that will appear in the Standards itself.

Table 1 — Terminology for this report

Term	Definition	Comments
Directive	The Pyrotechnic Articles Directive (2007/23/EC)	Formally "Directive 2007/23/EC of the European parliament and of the Council of 23 May 2007 on the placing on the market of pyrotechnic articles"
ESRs	Essential Safety Requirements as detailed in the Directive	
NEC	Net Explosive Content	Also NEQ, NEM have the same meaning
WG1	Working Group 1 of CEN TC 212 - addressing cat 1/2/3 fireworks	
WG2	Working Group 2 of CEN TC 212 - addressing cat 4 fireworks	
WG3	Working Group 3 of CEN TC 212 - addressing T1/T2 pyrotechnic articles for theatrical use	This group
WG4	Working Group 4 of CEN TC 212 - addressing pyrotechnic articles for automotive use	
WG5	Working Group 5 of CEN TC 212 - addressing other pyrotechnic articles	
Civil Uses Directive	Directive 1993/15/EC concerning the placing on the market of explosives (except pyrotechnics)	
T1 pyrotechnics	Theatrical pyrotechnic low hazard items available to persons WITHOUT specialised knowledge	

Table 1 *(continued)*

Term	Definition	Comments
T1 users	Users of T1 products	Exclusive use of T1 products
T2 users	Users of T2 products	Users may also use T1 products
T1(od)	T1 outdoor only products	Although this is not a formal category within the Directive WG3 have adopted it as a way of discriminating between the 2 sub-categories of T1

3 Scope of Standards for T1 and T2 pyrotechnic articles

The Pyrotechnic Articles Directive (2007/23/EC) concerns issues of supply and not use. The purpose of Standards development is to provide a harmonized means of achieving the Essential Safety Requirements (ESRs) specified within the Directive.

WG3 agree that, where possible, the Harmonized Standards to be developed should be

- performance based;
- address safety of the product in normal functioning as the primary concern;
- as simple as possible;
- as flexible as possible – to allow for future developments in product design – particularly for T2 products.

WG3 further agree that a single Standard, covering T1 and T2 products should ideally be developed and further that it should address all known T1 and T2 types and future developments of T2 articles within this single Standard. However, WG3 have determined that a number of project groups will be needed to address specific features of the Standard as follows:

- terminology;
- categorisation;
- requirements;
- labelling;
- test methods

and that the sections developed by these project groups will ideally be combined into a single final standard.

Further details of the designated project groups is given in Clause 24.

WG3 consider that one single Standard will cover both T1 and T2 Theatrical Pyrotechnic articles. The rationale behind this decision is:

- It will lead to simplification of the technical requirements and test methods and prevent “copy/paste” or inconsistency errors if multiple Standards are developed.
- T1/T2 items are often similar in construction, performance, effect and safety parameters.

WG3 considers that “type testing” (Module B of the Directive) and “batch testing” (“Conformity to Type” - Module C/D/E of the Directive) are likely to be the most frequent means by which product compliance will be met. Hence in the initial development phase WG3 intends to consider these methods primarily. It is also considered that many of the features of the remaining compliance modules will share common features with those of Module C/D/E in relation to the requirements for batch testing.

A comparison of Modules B and C with the Essential Safety Requirements specified in the Directive is given at the end of this report.

4 Overview of existing Standards and National provisions

A wide variety of national provisions and standards exist for Theatrical Pyrotechnics across Europe and control of supply ranges from outright prohibition on supply to persons without specialist knowledge to unrestricted supply. Only some Member States have standards by which theatrical products are approved for use. In other countries articles are only categorised or classified by the UN transport tests and criteria.

Only one Member State (UK) appears to have a true consumer pyrotechnic market for theatrical pyrotechnics (T1) and in this country, apart from a lower age limit of 18 years of age, there is no other restriction on who can purchase or use theatrical pyrotechnic articles. Other Member States have some restrictions over the purchasing or use of theatrical pyrotechnic articles in addition to age restrictions.

It is apparent, however, that the perception of what constitutes a T1 pyrotechnic article differs widely and in Germany, for instance, even though T1 Articles are readily available they are subject to a licensing regime prior to use. If Member States wish to retain additional controls on use this will be a matter for them and the Commission; however, they will not be addressed in development of the Standards.

5 Interface with other CEN TC 212 Working Groups

This technical report has been written in close consultation with the working groups WG1, WG2, WG4 and WG5 of CEN/TC 212 and where possible shares terms and approaches with them. However we envisage that coalescence of these will only occur once the Standards for Cat 1/2/3 Fireworks (WG1) are adopted and when work on other Pyrotechnic Article Standards is more highly developed. WG3 is fortunate to have many members who sit on other WGs and WG3 welcomes the free flow of information between the groups.

Where possible common terminology and methodology will be adopted; however, WG3 members agree that where this is not possible T1/T2 Standards should address their own specific requirements.

6 General features of T1/T2 Pyrotechnic Articles for Theatrical use

WG3 members agree that, except where explicitly described within the Standards to be developed, all T1/T2 products should share the following common features:

- electric ignition;
- that there is no delay before first effect;
- the performance is within parameters described explicitly within the Standards to be developed.

In this manner T1/T2 products will be distinguished from functionally equivalent Cat 1/2/3 fireworks (which are lit by hand) or Cat 4 fireworks. Additionally it is considered that this reduces the degree of hazard of these materials by ensuring that

- the operator is at a remote firing position (except for hand held/ignited devices);

- there is a significantly reduced likelihood of performers (for example) moving into the safety area of a device between the time of initiation and the time of first functioning;
- the performance parameters are more stringent than for the functionally equivalent firework item.

7 Initial Terminology for the T1/T2 Harmonized Standard

The following terms have been developed in association with WG2 and WG5 and which will be incorporated, possibly with revisions, into the Harmonized Standard for T1 and T2 pyrotechnic articles:

Table 2 — Initial Terminology

Term	Description	Comments/Example
Generic Type	identifies articles with a common, very general, design feature or with a common characteristic effect under a single designation	Mine
Sub Type	identifies articles within a generic type which share common features (e.g. calibre and height)	25mm Colour – 5 metre
Individual Article	identifies a specific individual pyrotechnic article within a generic type and sub type, usually by effect	Red
Name	the combination of the above terms. Note that the individual article will also be identified by a unique product code, usually originating from the manufacturer in addition to a coding from the Notified Body that relates to the certificate for the product	Colour Mine - 25mm x 5metre- Red. (NB format of name to be determined)
Family/Group	identifies a number of individual items/articles which will be considered together for the purposes of testing and certification. A group or family will have common characteristic such as caliber, composition or NEQ. Note that the family or group will also be identified by a number originating from the notified body. All items considered together for the purposes of testing and certification will share this number.	5metre - 25mm Colour Mines Directive 2007/23 identifies that such groups/families should be established for the purposes of testing and certification (“whereas 18” of the Directive)
First Functioning	The initial manifestation of the primary effect of the device.	For instance the appearance of projected sparks from a fountain
Initiation	The initial transfer of energy from an initiating device (match or igniter) to the device	

Table 2 *(continued)*

Term	Description	Comments/Example
Hazard	an intrinsic feature of an item or activity irrespective of the actual functioning of the item which could cause damage or injury	See later for further information
Risk	a combination of the inherent hazard and the likelihood of an item or activity causing damage or injury	See later for further information
Label	Instructions and information attached to the device or packaging	
Supplementary Product Information (SPI)	Additional information provided to the user. It may be presented in a "hard copy" form on or within the packaging of the article, by the manufacturer direct to a user, or electronically.	
Effect Hazard	For example, incandescent or high energy fragments arising from the normal functioning of the device, or a thermal effect that may cause injury or damage	Does not include deliberately projected, low energy particles (such as confetti) produced by the device. The effect hazard may be used as a determinant of, for example, performer safety distance in the Standards to be developed.

Terminology will be further extended and refined during the development phase of the Harmonized Standards

8 Overview of Types of T1/T2 Pyrotechnic Articles to be considered

The following types of theatrical pyrotechnic articles have been identified along with their definitions and primary effect.

Table 3 — List of Generic Types and Definitions

No	Generic Type	Definition	Primary Effect/Comments
1	Combination	Assembly including several elements either containing the same type or several types each corresponding to one of the types of pyrotechnic devices listed in this table, with one or multiple points of ignition and in which the initial fuse transmits fire from one tube to the next to fire the devices sequentially or in some other pattern	As per the individual elements. Note that WG3 consider there is no practical difference between a “Battery” and a “Combination” as in EN14035 and will consider them together. Where the individual elements could not be separated and still function individually, such items are not considered to be a combination.
2	Bengal flames + flares	A device containing a pyrotechnic substance which produces a (coloured) light or flame where the duration of the effect is not instantaneous	Production of coloured flame (and smoke)
3	Theatrical Fire	A pyrotechnic substance that is ignited in suitable container (open flame-bowl) or in a preformed cartridge to produce a (coloured) light or flame effect	Production of coloured flame (and smoke)
4	Bengal sticks	A stick partially coated with slow-burning pyrotechnic composition and designed to be held in the hand	Emission of a bright light for a stated duration
5	Stage report	A single sealed unit containing a pyrotechnic composition whose principle function is to produce a bang	A pyrotechnic device that produces an instantaneous Report with or without coloured light and / or sparks
6	Flashes	A device containing pyrotechnic composition(s) where the effect is instantaneous and whose primary effect is a flash	A pyrotechnic device that produces an instantaneous flash of light which may be accompanied by smoke, sparks and/or an aural effect and emits microstars
7	Flash reports	A device containing a pyrotechnic composition whose primary effect is a flash accompanied by a report	
8	Airbursts	A device containing a pyrotechnic composition which is suspended into the air and functions to produce a visual and/or aural effect	An instantaneous aerial effect to produce a visual effect and / or aural effect
9	Fountains	A device containing pressed or consolidated pyrotechnic composition(s) producing sparks in a directional manner	Includes "Jets"

Table 3 *(continued)*

10	Dropping effects	A single tube which may or may not be choked at one end that contains a pyrotechnic composition and which is designed to produce its effect in a downward direction	Including waterfalls
11	Mines	A device containing propellant charge and multiple pyrotechnic stars and/or pyrotechnic units which are ejected in a single burst in a directional manner	A pyrotechnic device containing pyrotechnic effects which are instantaneously and simultaneously projected in an upward direction to a dispersed visual and or aural effect
12	Confetti + streamer cartridges	A single tube containing a pyrotechnic composition and inert items which projects the inert items from the device	A pyrotechnic device that produces an instantaneous ejection of paper or novelty effects. May produce noise and/or smoke
13	Line rockets	A device containing a pyrotechnic composition that is designed to be attached to a wire and has a controlled trajectory	A pyrotechnic device that is propelled along the wire it is attached to whilst producing light and/or aural effect(s) and/or sparks and or coloured smoke
14	Comets	A device containing propellant charge and a single pyrotechnic star or unit which is ejected in a single burst	A pyrotechnic device that ejects a single pyrotechnic unit producing a directional visual effect
15	Roman candles	A device consisting of a single tube containing a series of pyrotechnic units with alternate payloads and propellant charges, and a transmitting fuse	A pyrotechnic device that emits multiple units producing a directional visual effect
16	Flame columns, flame projectors	A device containing a pyrotechnic composition producing a projected column of flame with or without other visual and/or aural effects.	
17	Fire balls	A device containing a pyrotechnic lifting charge pyrotechnic compositions but not containing discrete pyrotechnic units which produces an instantaneous coloured ball of fire with or without smoke and/or sparks and/or aural effect	
18	Rotating effects	A device containing pyrotechnic compositions and functions in such a way that device rotates.	A pyrotechnic device that produces a rotational effect of coloured light and/or sparks with or without an aural effect.

Table 3 *(continued)*

19	Smoke devices	A device containing a pyrotechnic composition emitting smoke.	A pyrotechnic device that emits coloured smoke for a stated duration. Device must not emit toxic or corrosive gasses/smoke specifically designed for extermination purposes
20	Explosion Simulators	A device containing a pyrotechnic composition and/or pyrotechnic stars and/or pyrotechnic units and/or flammable solid and simulates a small or large explosion.	A pyrotechnic device that produces an explosion effect with noise, consisting of coloured fire and/or smoke and or sparks and/or other visual effect(s) and/or aural effect(s)
21	Squibs and Bullet hit squibs /Sparking squibs (ricochet squib)	A device containing pyrotechnic composition designed to disrupt inert material to mimic a bullet/puncture wound or small explosion	
22	Phlegmatised pyrotechnic substance	A substance which is non pyrotechnic when supplied but is converted to a pyrotechnic substance at the point of use	
23	Whistles	A device containing a pyrotechnic composition that produces an aural whistling effect with or without sparks	
24	Binary mixtures	Separate non pyrotechnic components which when combined form a pyrotechnic composition.	Various, but may include amongst others Report, coloured flash, fire, smoke, sparks
25	Flash trays / split tubes	A device containing pyrotechnic composition (s) which is designed to produce a two-dimensional curtain of sparks or other pyrotechnic effects	
26	“Bounced” fountain	Device containing pressed or consolidated pyrotechnic composition(s) producing light and sparks in a directional manner, and a small report inside, in such a way that, once the pressed composition is consumed, it ignites the report indicating the finishing of first principal effect.	Designed to be held in the hand by means of ancillary equipment
27	In-Hand effect	An article comprising only a pyrotechnic substance(s) and that is ignited within the hand and optionally thrown from the hand, and that is optionally self consuming.	May produce light, sparks, smoke or noise.

NOTE Some of the definitions do not match those of WG1 or WG2 for equivalent items. Definitions to be used within the Standards will be harmonized as much as possible - however there may be exceptions where the definition requires specific meaning for pyrotechnic articles for theatrical use.

The exact definitions may be revised following the work in developing the Standard(s).

9 Novel T1 and T2 Pyrotechnic Articles

WG3 members are concerned that in a rapidly developing field, Standards should be developed which allow novel devices to be developed without

- requiring new standards to be developed;
- forcing the items to undergo certification by comparison with the Directive ESRs alone.

Hence, in general, the Standards which are to be developed will be as general as possible and there will be specific features only when required by the product type. Where novel articles cannot be certified by this approach WG3 members consider that the notified bodies will determine which features of the Harmonized Standard will be applicable, and what other tests would be required by them as appropriate.

WG3 intend to write guidance on the use of the developed Standards for novel products.

10 Features of the T1 and T2 Standard to be developed

As described in Clause 3. WG3 consider that the Standard to be developed will address both "Type Testing" and "Batch Testing".

10.1 Generalised features of type testing

WG3 considers that Type testing will be carried out on Product Groups which encompass a range of individual articles including:

1. product dimension range;
2. NEC range;
3. product functioning times;
4. product chemistry range;
5. basic conformity to type description;
6. product labelling (generalised);
7. supplementary product information (generalised).

10.2 Generalised features of batch testing

WG3 considers the following features will be part of the Batch testing of T1 and T2 pyrotechnic articles.

1. Product performance characteristics (functioning height etc.);
2. Product timing characteristics (firing duration etc.);
3. Product specific labelling requirements;

4. Product specific supplementary product information requirements.

10.3 Features that will not be considered in a T1/T2 Harmonized Standard

WG3 considers that the following elements of T1/T2 pyrotechnic articles will not be considered in the development of Harmonized Standards.

- Electric ignition devices except where these are produced **specifically and exclusively** for use in T1/T2 pyrotechnic articles (instead such devices should be considered by WG5).
- Fusing elements between articles except where these are produced **specifically and exclusively** for use in T1/T2 pyrotechnic articles (instead such devices should be considered by WG5).

11 Outline of format of the Harmonized Standard for T1/T2 pyrotechnic articles

The following is our proposed contents for the T1/T2 Pyrotechnic Article Standard:

1. Scope
2. References
3. Terminology
    - 3.1. Generic types
    - 3.2. Technical terms
4. Construction requirements
    - 4.1. General
    - 4.2. Specific (relating to T1, T1(od) or T2 or product type)
5. Performance requirements
    - 5.1. General
    - 5.2. Specific (relating to T1, T1(od) or T2 or product type)
6. Labelling and user's documentation
    - 6.1. General
    - 6.2. Specific (relating to T1, T1(od) or T2 or product type)
    - 6.3. Supplementary Product Information (SPI)
7. Recommendations for tests
    - 7.1. List of recommended test methods
    - 7.2. Allowed tolerances
    - 7.3. Accuracy and statistical approach
    - 7.4. Approval of alternative test methods

8. Annex 1 - Safety distances

    8.1. Standard performance distances for T2 products

    8.2. Guidelines for determination of safety distances in real use

9. Annex 2 - Other features related to ESR and certification

10. Annex 3 – Translations of standard safety phrases

12 Defining Criteria for T1 and T2 and the T1/T1(od)/T2 “split”

The Directive only deals with the generation of Standards for which Theatrical Pyrotechnic Articles must comply in order to be placed on the market and to whom they may be supplied. It does not mandate the definition of who is or is not a "person of specialist knowledge" or the requirements to become a person of specialist knowledge, this will be a matter for the Member States.

However the directive does call for a distinction between pyrotechnic articles for stage use that present a low hazard (T1), by inference those T1 items which may only be used outdoors (T1(od)) and those pyrotechnic articles for stage use which are intended for use by persons with specialist knowledge (T2). Hence the Standards developed must define and distinguish each of these groups and make it clear which articles when tested against the standards will be T1 and which will be T2.

In deciding the dividing line between T1 and T2, WG3 consider that only the safety of the product when used correctly should be considered, and not the possible misuse of the theatrical pyrotechnic articles.

The following table (Table 4) was developed by WG3 members to investigate which potential criteria could be used to determine the split between T1 and T2 products.

	T1	T2	NEC/NEQ/NEM	Height of effect	Width of effect	Dangerous Debris	All debris	Potential Malfunction	Consequence of malfunction	Noise	Duration	Diameter	Type of ignition	Assembly at point of use	Ancilliary equipment	Specialised knowledge	Additional information not on label/pack	Indoor	Outdoor	Produces secondary Hazards	Primary Performer	Secondary Performers	Audience	Reaction Rate (mass consumption by time)	Other hazards on site	Exclusion Zone	Cross Ignition
Combinations	x	x	x	x	x	x	x	x	x	x		?		x	x	x	x	x	x	x	x	x	x		x	x	x
Bengal flames + flares	x	x	x					x	x					x	x	x		x	x	x	x		x	x			
Theatrical Fire	x	x	x											x	x	x		x	x		x		x	x			x
Bengal sticks	x	x						x	x									x	x	x	x		x	x			
Stage reports	x	x	x			x	x			x			x	x	x	x		x	x	x	x	x	x			x	
Flashes	x	x	x		x	x		x	?	x			x		x	x		x	x		x	x	x		x	x	x
Flash reports	x	x	x			x	x			x			x	x		x	x	x	x	x	x	x	x			x	
Air bursts	?	x	x		x	x	x			x			?			x		x	x	x		x	x		x		x
Fountains + volcanos	x	x	x	x		x		x	x	x		?	x	x	x	x	x	x	x	x	x	x	x		x	x	x
Jet	x	x	x	x				x	x					x	x	x		x	x		x	x	x			x	x
Dropping effects	?	x	x	x		x	x	x	x	x				x	x	x	x	x	x		x	x	x		x	x	x
Mines	x	x	x	x	x	x	x	x	x	x				x	x	x		x	x	x	x	x	x		x	x	
Confetti + streamer cartouches	x	x				x	x			x			x	x	x	x	x	x	x	x	x	x	x			x	
Line rockets	?	x				x	x	x	x	x			x	x	x	x	x	x	x	x	x	x	x		x	x	
Comets	x	x	x	x		x	x	x	x	?			x		x	x	x	x	x	x	x	x	x		x		
Roman candles	x	x	x	x		x	x	x	x	?	x		x		x	x	x	x	x	x	x	x	x		x		x
Flame columns, flame projectors	x	x	x	x			x	x	x					x	x	x	x	x	x		x	x	x		x		x
Fire balls	x	x	x	x	x	x	x	x	x						x	x	x	x	x	x	x	x	x		x	x	
Rotating effects	x	x	x	x	x	x	x	x	x					x	x	x	x	x	x	x	x	x	x		x	x	x
Smoke devices	x	x	x					x	x				x	x	?		x	x	x	x	x	x	x				
Explosion Simulators	x	x	x	x	x	x	x	x	x	x						x	x	x	x	x	x	x	x				
Squibs and Bullet hit squibs		x				x	x			x				x	x	x	x	x	x		x	x	x				
Short circuit simulators	x	x	x	x	x	x	x			x					x	x	x	x	x		x	x	x		x	x	x
Nitrated Cellulose	x	x	x											x	?	?	x	x	x		x	x	x				
Whistles	x	x	x					x	x	x	?						x	x	x		x	x	x	x			x
Binary mixtures FLASH		x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	?	x	x	x		x	x	x
Binary mixtures (NON FLASH)	x	x	x	x	x	x	x	x	x	x			x	x	x	x	x	x	x	?	x	x	x	x	x	x	x
Flash trays / split tubes	x	x	x	x	x	x	x			?			x	x	x	x	x	x	x		x	x	x			x	x
Bounced Fountains																											
"In hand" effects																											

Table 4 — Potential criteria for the T1/T2 split

The criteria considered are:

Criterion	**Explanation**
NEC/NEQ/NEM	The net mass of explosive components in the article
Height of effect	The functioning height of the effect when fired vertically
Width of effect	The functioning width of the effect when fired vertically - which may be expressed as diameter or radius
Dangerous Debris	Whether dangerous debris is produced - for instance sparks, fragments of the case, thermal effects etc.
All debris	All debris - whether hazardous or not
Potential Malfunction	The possibility of malfunction
Consequence of malfunction	The most severe consequences of malfunction - including explosion
Noise	The level of noise produced at the relative distance (operator, performer, audience)
Duration	The duration of the effect
Diameter	The calibre of the device (e.g. for mines, fountains or Roman candles)
Type of ignition	Electric or manual
Assembly at point of use	Whether manipulation is required by the user prior to use
Ancillary equipment	Whether ancillary equipment is required (provided or not)
Specialised knowledge	Whether specialist knowledge is required (and hence to exclude from T1)
Additional information not on label/pack	Whether additional information is required that cannot be made on the label
Indoor	If the product is for indoor use ONLY
Outdoor	If the product is for outdoor use ONLY
Produces secondary Hazards	If the device produces secondary hazards (e.g. toxic fumes)
Primary Performer	If the device may impact adversely on the primary performer (e.g. for a hand-held device)
Secondary Performers	If the device may impact adversely on other performers
Audience	If the device may impact adversely on the audience
Reaction Rate (mass consumption by time)	The rate of burning (g/s)
Other hazards on site	The adverse impact on other hazardous substances on the site
Exclusion Zone	The need for a fixed exclusion zone
Cross Ignition	The possibility of cross ignition from/to another device

WG3 members considered that although this quantification is useful, it is too complicated for development of criteria for the T1/T2 split and for the development of Harmonized Standards; although elements may be useful in providing Supplementary Product Information (SPI) to users.

Hence WG3 considered only basic performance criteria (height and width of effect) and maximum NEC per article in the T1/T2 split criteria.

13 Table of T1 Indoor/Outdoor split criteria

The following tables reflect the extensive discussions within WG3 to determine a "split" between T1/T1(od) and T2 products.

WG3 members intend to re-examine the values for distances and Max NEC values within the following tables during the development of the Standards and as a result of planned product demonstrations to be developed by members of WG3.

	T1 Indoor/Outdoor			
Type	**h dist**	**v dist**	**Max NEC**	**Notes**
Combination				Not T1
Bengal flames + flares	0,5	0,5	500	
Theatrical Fire	0,5	0,5	500	
Bengal sticks			7,5	as Cat 1FW
Stage report (maroons)	??	??	10	120dB at safety distance (distance tbd)
Flashes	5	5	15	Max dB tbd - criterion for flash
Flash reports (flash with report)	??	??	10	120dB at safety distance (distance tbd)
Airbursts	5	5	15	Not T1
Fountains	3	8	100	
Jet	3	10	15	
Dropping effects	3	10	50	
Mines	5	8	10	
Confetti + streamer cartridges	2	5	10	
Line rockets		4	10	to be further discussed
Comets	2	8	10	
Roman candles				Not T1
Flame columns, flame projectors	1	4	200	
Fire balls	3	5	50	
Rotating effects	2	2	50	50g max per component - max 200g
Smoke devices			50	30 secs max - to be discussed if included

Explosion Simulators	5	5	25	To be discussed
Squibs and Bullet hit				Not T1
Phlegmatised pyrotechnic substance	1	1	10	Distance from burning surface
Whistles	3	7	50	120dB at safety distance (distance tbd)
Binary mixtures				Not T1
Flash trays / split tubes	3	5	50	
"Bounced" Fountain	3	8	100	To be determined
"In hand" effect				To be determined
NOTE h dist = horizontal effect distance (m) (when fired vertically), v dist = vertical effect distance (m) (when fired vertically), Max NEC = maximum NEC (g) permitted for these items.				

14 Table of T1(od) split criteria

The Directive requires T1 pyrotechnic articles to present a “Low Hazard”. In considering T1(od) criteria WG3 members have related the performance and NEC criteria to those for Cat 2 and Cat 3 fireworks.

Type	**h dist**	**v dist**	**Max NEC**	**Notes**
Combination				As per individual elements
Bengal flames + flares	1	1	2500	
Theatrical Fire	1	1	2500	
Bengal sticks	1	1	500	
Stage report (maroons)	??	??	20	
Flashes	10	10	50	
Flash reports (flash with report)	??	??	50	
Airbursts	10	10	25	
Fountains	15	n/r	1000	Refer to Cat 3 - n less than Cat 3
Jet	5	n/r	50	
Dropping effects	5	10	100	
Mines	15	n/r	300	Cat 2/3 proposals
Confetti + streamer cartridges	2	5	20	
Line rockets		4	40	
Comets	15	n/r	50	Cat 3 single shot comet
Roman candles	15	n/r	300	(<50g per shot)
Flame columns, flame projectors	2	8	1000	
Fire balls	5	8	200	
Rotating effects	15	n/r	900	As per cat 3

Smoke devices			1000	
Explosion Simulators	15	n/r	200	120dB limit at safety distance
Squibs and Bullet hit				Not T1
Phlegmatised pyrotechnic substance				Not specific T1 outdoor
Whistles				120dB at safety distance (distance tbd)
Binary mixtures				Not T1
Flash trays / split tubes	15	n/r	300	
"Bounced" Fountains	15		1000	To be determined
"In hand" effects				To be determined
NOTE h dist = horizontal effect distance (m) (when fired vertically), v dist = vertical effect distance (m) (when fired vertically), Max NEC = maximum NEC (g) permitted for these items, n/r=not restricted.				

Cat 2 fireworks are considered “Low Hazard” in the Directive and Cat 3 fireworks are considered “Medium hazard”. However WG3 members consider that T1(od) products may be equated to Cat 3 because of

- the generalised features of T1/T2 products described above (electric ignition, remote firing position);
- common usage of Cat 3 fireworks at present as theatrical pyrotechnic articles by operators using a range of other pyrotechnic articles on stage. For instance, where mines are fired from open ground behind a stage it is logical for them to be considered as T1 articles and to be fired by the same persons as are firing the on-stage items. However, in this case it is advisable and practical, and lower hazard, for such items to be fired electrically.

15 Features of T1 and T2 Pyrotechnic Articles

In addition to the general criteria for all pyrotechnic articles for stage use, there are specific features relevant to T1, T1(od) and T2 pyrotechnic articles.

NOTE The general features are included in the clauses below for completeness.

15.1 Features of T1 Pyrotechnic articles for indoor and outdoor use

WG3 members consider that the following are inherent features of T1 pyrotechnic articles for indoor and outdoor use

- Electric Ignition (except certain hand lit articles as specified in the standard);
- that there is no delay before the first effect (except hand certain hand lit articles as specified in the standard);
- the performance is within parameters (to be determined) described explicitly within the Standards to be developed;
- that no hazardous debris may extend beyond **XXX** metres (to be determined);
- that no hazardous debris may be projected laterally more than **XXX** metres (to be determined);

- that no highly toxic fumes may be produced;
- that heat produced by the product should not ignite the expected paraphernalia within a theatre or other place where T1 products would be used by persons without specialist knowledge (parameters to be determined).

15.2 Features of T1 Pyrotechnic articles for outdoor use only

WG3 members consider that the following are inherent features of T1 pyrotechnic articles for outdoor use only.

- Electric Ignition (except certain hand lit articles as specified in the standard);
- That there is no delay before the first effect (except hand certain hand lit articles as specified in the standard);
- The performance is within parameters (to be determined) described explicitly within the Standards to be developed;
- That no hazardous debris may extend beyond **XXX** metres (to be determined);
- That no hazardous debris may be projected laterally more than **XXX** metres (to be determined).

15.3 Features of T2 Pyrotechnic Articles

For the purposes of this Standard all theatrical pyrotechnic articles that do not conform to the T1 criteria, maybe considered as T2 Theatrical Pyrotechnic Articles.

In addition, WG3 members consider that the following are inherent features of T2 pyrotechnic articles.

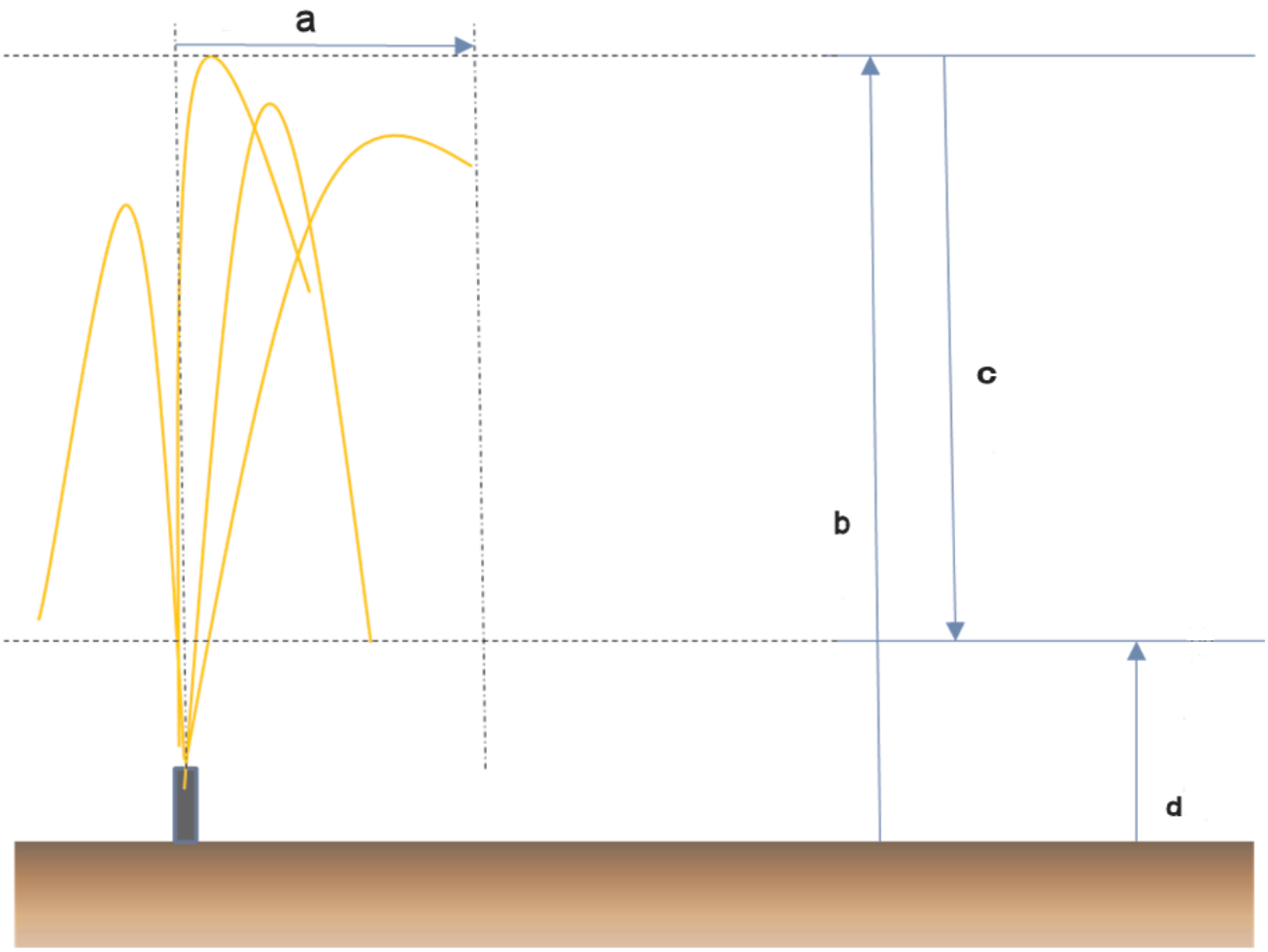
- Electric Ignition (except certain hand lit articles as specified in the standard);
- That there is no delay before the first effect (except hand certain hand lit articles as specified in the standard);
- The performance is within parameters (to be determined) described explicitly within the Standards to be developed;
- That the user (with Specialist Knowledge) has sufficient information provided with the product (and allied to their training) to allow them to use the product in a variety of situations with minimum risk.

T1 articles being used outside the scope of the T1 Standards e.g. used at a safety distance which is less than prescribed shall be considered as T2 so that if a person of specialist knowledge wishes to use a T1 product outside of the scope they can. WG3 consider this an essential feature of National Regulations adopting the Directive.

The Standards should be as inclusive as possible, no theatrical pyrotechnic article should be excluded from T2 unless it is deemed unsafe to handle, store or transport. Hence the WG envisage standard test methods which will encompass any future developments of products.

For the purposes of this Standard the Safety Distances for T2 Theatrical Pyrotechnic articles refer to the effect parameters of the article i.e. Height, Width, Noise Level, Drop etc.

15.4 General parameters for T1 and T2 pyrotechnic articles



Key

a Effect radius

b Effect height

c Effect drop

d Effect above ground

16 Labelling of T1 and T2 Pyrotechnic Articles

Labelling is critical to safe use of T1 and T2 pyrotechnic articles; however the contents of the label differ significantly.

There are mandatory requirements for labels for T1/T2 products.

- Name and Address of Manufacturer;
- Name of Article;
- Type of article;
- Relevant category;

- Instructions for use (however this could be different in scope for T1 and T2);
- Age limits (T1 = 18 years);
- Year of production;
- NEC;
- T1 – where appropriate “for outdoor use only”;
- T2 - “for use only by persons with specialist knowledge”;
- Minimum safety distance(s);
- CE Mark.

NOTE Note that we are proposing the combining of terms. See example above.

And information that WG3 members would be useful to users of T1 or T2 products.

- (Fuse time);
- (Delay time);
- Effect duration;
- Height of functioning;
- “Effect size” – see above;
- Calibre;
- Actual effect – where this differs from name;
- Part Number;
- NB Number.

WG3 consider that certain elements of these requirements can be successfully combined to provide a more comprehensive label. For instance, type, category and name can be combined as in

T1 Pyrotechnic Article – Fountain - 25s x5metres – Red

and that for T2 pyrotechnic articles WG3 considers performance and other timing data could be combined.

WG3 have also considered the size of labels on T1/T2 articles and have identified that given the physical size of the devices, and the complexity of the information required for the users (especially of T1 products) much of the information may have to be provided on packaging or as Supplementary product Information (SPI).

16.1 Use of translated standard phrases

WG3 consider that the Harmonized Standard should specify the labelling requirements for each type in terms of referenced safety phrases for

- warnings;
- effects;

- instructions;
- disposal;
- etc.

In addition, each of these referenced phrases should be available in the Harmonized Standard in a table of translated forms. In this manner, it would be simple to ensure that labelling is available in a standard form and in the language(s) of the recipient Member State irrespective of the manufacturer/importer being fluent in the appropriate language. Type testing should identify which safety phrases are appropriate for each identified group and batch testing to confirm that the relevant translation has been employed for that particular batch.

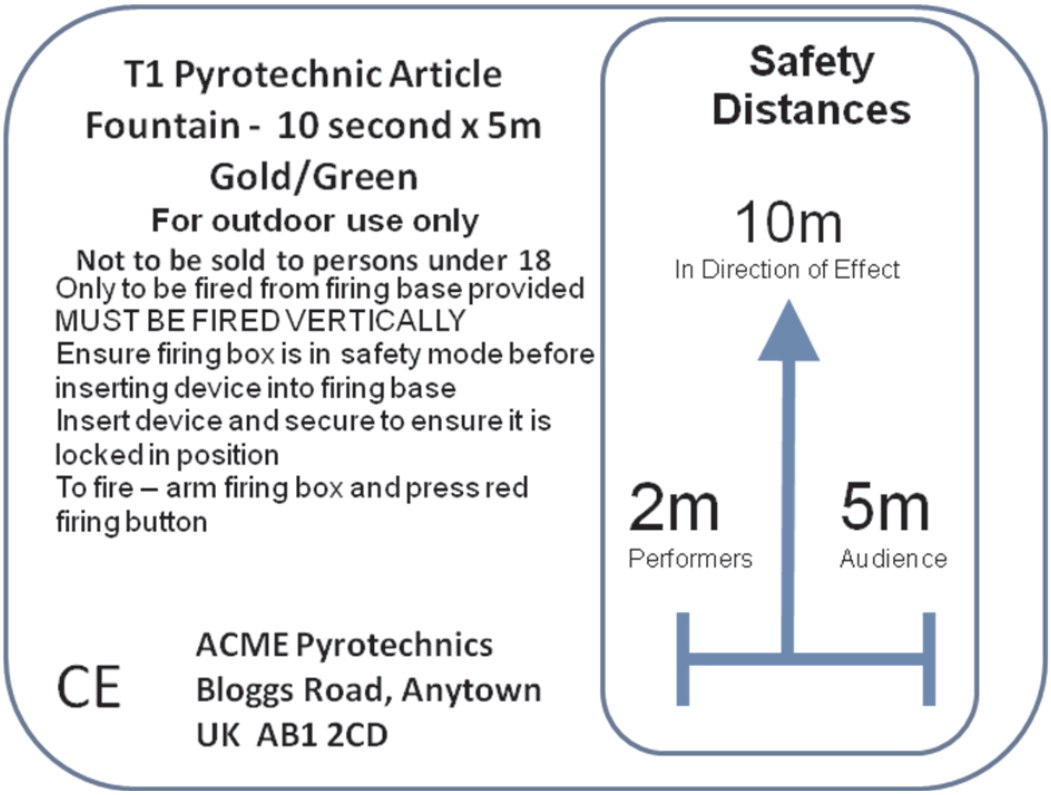
Furthermore WG3 suggest that a list of translated phrases should be maintained electronically (on T1/T2 or CEN website) to allow translations into languages from future members of the EC.

16.2 Labelling of T1 Pyrotechnic Articles

The instructions and labelling of T1 articles should be prescriptive and provide the user with all necessary instructions and information to function the device safely.

Article 12 section 4 of the Directive requires that T1 articles have a minimum safety distance stated on the label. WG3 see the possibility of more than 1 safety distance being required on the label due to the diversity in use of the product e.g. the safety distance to the audience and a separate safety distance to other actors/technical staff that know when the device will be functioned and the effect produced. For the purposes of this standard the Safety Distances for T1 Theatrical Pyrotechnic Articles are considered to be the distances at which the risk of the greatest hazard is reduced to as low as reasonably practical during the normal functioning of the device in the manner described by the instructions for use.

Labelling shall take the form of standard phrases each denoted by a code within the Standard. The phrases shall be listed in an annex to the Standard and will provided in the languages of the Member States such that products may be labelled with the correct wording without the need for translation. We also envisage that such a list of translations should be maintained on the CEN website to allow for new languages to be added in the future.



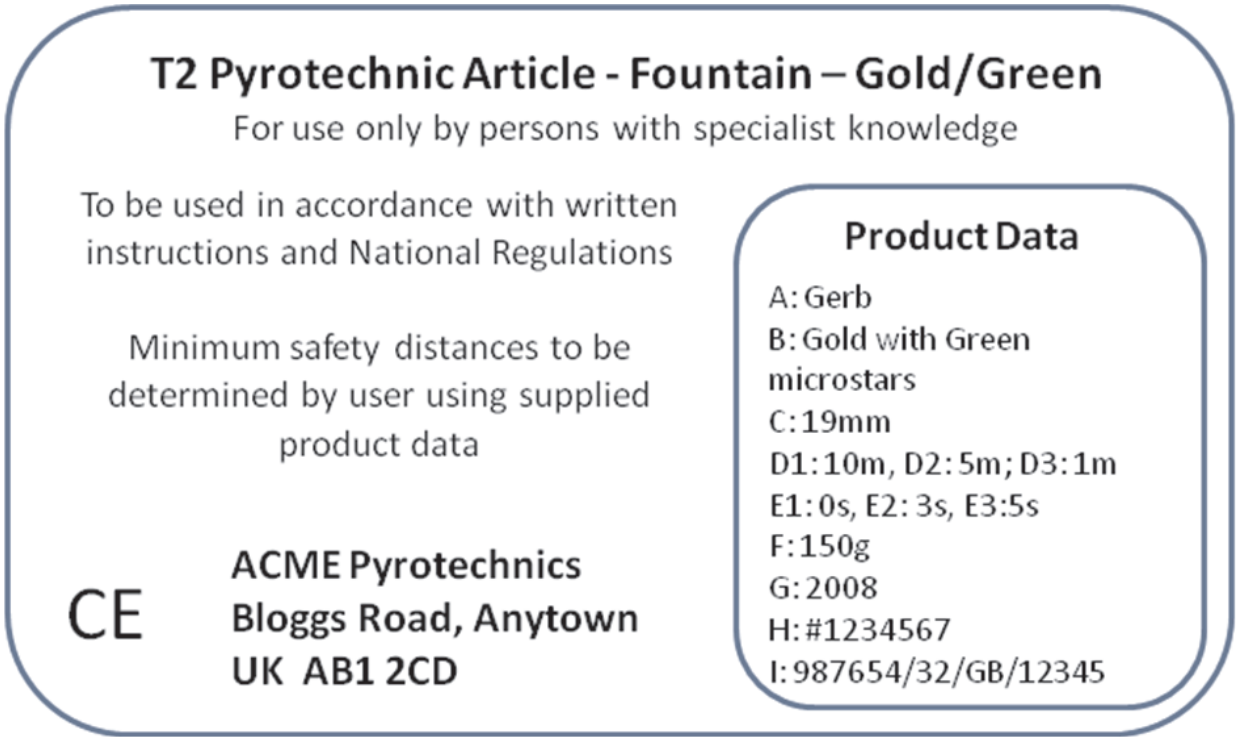
16.3 Labelling of T2 Pyrotechnic Articles

The instructions and labelling for T2 articles should be informative, allowing the person with specialist knowledge to make informed decisions regarding the use of device.

The information supplied with T2 articles should not enable a person without specialist knowledge to use the device.

It is proposed to provide this information to users of T2 products in a codified or explicit form (to be decided) incorporating the following elements:

- A: Specific Type;
- B: Effect Description;
- (C: Calibre);
- D: Effect height, Effect spread (burst diameter?), Effect above ground;
- (E: Initial Fuse Time, Delay time to functioning), Effect duration;
- F: NEC;
- G: Year of Manufacture;
- H: Part No;
- I: Notified Body Number.



WG3 will work closely with WG2 to develop a common labelling approach to T2 Pyrotechnic Articles/Cat 4 Fireworks.

17 Prohibited components and chemicals in T1 and T2 products

WG3 consider that the approach adopted by EN 14035 and WG1 on the prohibition of chemical components in Cat 1/2/3 products is appropriate for T1 products. The approach to T2 products is still to be determined.

The list of prohibited substances and mixtures is to be determined as the Standard is developed.

However, WG3 do consider that any list of prohibited chemicals should be sub-divided to identify the aspect of the ESRs to which it might apply. For instance

- substances hazardous to the environment (as a result of normal functioning or disposal);
- substances hazardous to health (as a result of normal functioning or disposal);
- substances hazardous to health (as a result of manufacturing);
- substances which pose a hazard from inherent chemical instability;
- substances which may pose a hazard from admixtures present within the article.

17.1 Articles containing any prohibited chemicals

WG3 require any pyrotechnic article containing a prohibited chemical to be certified by the Notified Body in direct consideration of the Essential Safety Requirements and do not intend to write Harmonized Standards which apply to such items.

18 Comparison of Standards with Essential Safety Requirements

The following table compares the issues already addressed by WG3 and those that will need to be addressed during the development of the Standard.

Table 5 — Comparison of ESRs with Standards for T1/T2

ESR Summary	TT (see notes)	BT (see notes)	Comments etc
(1) Pyrotechnic articles must perform in a specified manner.	Test Docs	Test	The tested item should be in accordance with the manufacturer's drawings and the scope of the family. The drawing should show any relevant component, e.g. pyrotechnic unit, with its dimensions, the masses of each pyrotechnic charge as well as the detailed pyrotechnic composition of the article.
(2) Pyrotechnic Articles must be able to be disposed of in an environmentally friendly way.	Docs		The item should not contain forbidden chemicals detailed within the Standard relating to environmental concerns
(3) Each pyrotechnic article must function correctly when used correctly.			
(a) Design and construction	Docs and tests		Description of the article compared with the manufacturer's drawing and type test dissection to confirm composition, weights, mass fractions etc.

Table 5 *(continued)*

(b) The physical and chemical stability.	Docs and tests		The tested item should not contain forbidden substance or mixes. WG3 do not consider tests for flash powder as prescribed in the UN manual relevant to product stability and that the following tests will suffice
(c) Sensitivity to handling / transportation			WG3 consider that stability in transport is adequately covered by the UN classification regime and that it would be irrelevant to attempt to test individual articles (as per criterion 3b)
(d) Compatibility of components	Docs and test		The tested item will not contain forbidden substances identified as having chemical incompatibilities (as per criterion 3b)
(e) Resistance to moisture (if applicable)	Test		For aquatic products only: the item must be tested in accordance with the normal firing
(f) Resistance to temperature fluctuation	Test		For high temperatures use thermal conditioning as above. If certification is required at low temperature is required by manufacturer then NB must carry out tests under specified conditions.
(g) Protection against inadvertent initiation	Test Docs		Fuse igniting: verification of presence of fuse cover (if applicable) Electric ignition: Verification of instructions for users
(h) Suitable use, handling, storage and disposal instructions.	Docs		Observe the labelling and/or instruction for use + SPI of the item
(i) Suitability of packaging			WG3 consider that packaging for transport is adequately covered by the UN classification regime and that it would be irrelevant to attempt to test individual articles (as per criteria 3b/c)
(j) Specification of ancillary equipment and operating instructions.	Docs		Verification of the instructions for the user
During transportation and normal handling, unless specified by the manufacturer's instructions, the pyrotechnic articles should contain the pyrotechnic composition	Test		As per criterion 3b
(4) Pyrotechnic articles must not contain:			
(a) Commercial blasting agents.	Docs		Examine the chemical composition as documented. See also comments on the use of such explosives and CEN TC 212 papers to EC
(b) Military explosives.	Docs		

BT to be developed in the Standard

Notes: Test – by physical test, Docs – by examination of documentation provided by the manufacturer

TT = Type Test (Module B), BT = Batch Test – conformity to type (Module C)

19 Identification of Test Methods

When testing the functioning of Theatrical Pyrotechnic Articles is important that each article/group/family is tested in accordance with how they are intended to be used and the conditions they are intended to be used in.

WG3 intend to use established test methods devised for Cat 1/2/3 fireworks where possible.

20 Standard Performance Distances for T2 Products and Guidelines for Determination of Safety Distances in real use

WG3 intends to provide assistance to users with Specialist Knowledge on interpretation and use of the information provided on the T2 product label to achieve a low risk to users, performers, the audience and to other hazards arising from the use of the product.

WG3 consider that this should form part of an annex to the Standard and also be available online to permit new advances to be made available to a wide audience.

21 Issues Identified

There are several issues that have been identified by WG3 and which require clarification by the Commission.

21.1 Military Explosives and Commercial Blasting Agents

The Essential Safety Requirements of the Pyrotechnic Directive (Annex I sections 4(a) and 4 (b)) specifically exclude pyrotechnic articles that contain commercial blasting agents, except black powder and flash powder and also military explosives. However, it has been noted by WG3 that some theatrical pyrotechnic articles that are currently commercially available contain these prohibited components.

21.2 Substances used as Theatrical Pyrotechnics

There are also many commercially available Theatrical Pyrotechnic products that are not articles e.g. binary powders, Nitrocellulose products (flash paper, cotton and string) and thus not strictly covered by this directive. WG3 would like these items included in the scope of the directive so as to ensure that the directive encompasses all existing commercially available Theatrical Pyrotechnics.

21.3 Other issues relating to the Essential Safety Requirements

The Essential Safety Requirements of the Directive detail a number of specific requirements for “other pyrotechnic articles”. WG3 do not consider that these provisions apply to T1/T2 products as the term “other pyrotechnic articles” is used explicitly within the Directive for P1/P2 products. If this assumption is deemed to be incorrect WG3 will revise their approach to development of Harmonized Standards.

21.4 Definition of “Low Hazard” in the Directive

WG3 members believe that the use of the term “Low Hazard” in the Directive is ambiguous and contradictory to the approach already adopted by WG1.

Hazard is an intrinsic feature of an item or activity irrespective of the actual functioning of the item. As all T1/T2 articles have, necessarily, explosive properties it is difficult to conclude that they inherently could pose a low hazard. For instance the functioning of even the smallest T1 mine would cause significant injury to an operator if the device were hand held, or oriented towards the operator’s face.

The overall likelihood of a particular item or activity causing the specified injury or accident relates to many parameters including:

- the relative positions of the operator (or others) to the device;
- the relative orientation of the device;
- the possible malfunctions of the item and their relative probabilities;
- the initiation mechanism for the device;
- the delay between initiation and functioning of the device in the situation in which it is functioned (e.g. for fireworks a delay is desirable to allow the operator, who has "hand-fired" the device to retreat, whereas for T1/T2 articles any delay allows performers to enter an area of risk during this delay).

The risk from an item or activity is, essentially, a combination of the inherent hazard and the likelihood. In most risk assessment regimes this relationship is considered as

RISK= HAZARD x FREQUENCY

WG3 members consider that one of the primary purposes of the development of a Standard is to reduce, as far as possible, the likelihood of a particular item or activity causing injury or accident by the following means

- providing information to the user (via labelling or Supplementary product information) to enable the user to operate the device in a manner which minimises the risks;
- to ensure that the product is, as far as is reasonably practical, free from inherent manufacturing failures or design faults.

NOTE A destructive testing regime can never guarantee this.

Hence WG3 members consider that the term "Hazard" in the Directive should be considered as really meaning "Risk"; this approach is also being followed by WG2 and WG5.

21.5 Labelling in the language or languages of the recipient Member State

The Directive requires all products to be labelled in the language or languages of the recipient Member state. This requirement raises a number of issues:

1. This will necessarily complicate labelling, especially on smaller items.
2. The product may not be used in the Member State in which it was supplied. Enforcers at the place of use may not understand the language of the label and may attempt to restrict the use of the product; this must be addressed.
3. In case of product failure debris collected may not be in the language of the country in which it is used; hence it will be difficult to trace the originator of the product for disposal or information.

21.6 Multiple safety distances

The use of T1 and T2 products in close proximity to performers and often indoors means that there are a number of possible safety distances which are relevant to the user to maintain a high degree of safety. The Directive has only allowed T1 products to display a single "safety distance" whereas T2 products may display multiple "safety distance(s)". WG3 have sought CEN TC 212 approval to apply a consistent logic to T1 and T2 products.

Furthermore, if a T1 or T2 product is to be used at a variety of orientations then the safety distances to the various parameters will change. WG3 have determined that if it was determined that T1 products could be used at a variety of angles that would be determined by the user then the label should convey a safety distance in the direction of the effect (that is the greatest) which would allow for the firing of the device at any angle from vertical to horizontal (except dropping effects) without the need to calculate a more stringent safety

distance. For the purposes of labelling only it is proposed that this all encompassing safety distance be calculated by the application of a suitable multiplier to the effect height.

For T2 products WG3 have determined that it is important to provide the "person with specialist knowledge" sufficient information to be able to use the product in a variety of situations with minimum risk.

21.7 Member State obligations for determining Persons with Specialist Knowledge

WG3 members also consider that variations in the criteria applied by Member States in determining "Persons with Specialist Knowledge" may lead to undesirable effects which were not intended by the Directive. For instance, if the criteria are significantly less stringent in one Member State than a neighbouring Member State then we can see no reason why persons should not purchase T2 items in the former place, and then move them across the border and use them in another. The act of supply will have been carried out properly and legally and since "use" is not covered any additional constraints on use will have to be covered and enforced by individual member states.

WG3 suggests the European Commission consider this potential anomaly.

21.8 T2 users using T1 articles, Cat 1/2/3/4 fireworks or other pyrotechnic articles

WG3 is concerned that there may be enforcement issues where a person with specialist knowledge who has purchased T1, cat 1/2/3/4 or other pyrotechnic articles and is using them in a "professional" capacity and, potentially, with reduced safety distances.

This anomaly potentially arises because the Directive addresses supply and not use, and because the safety distances appropriate for "amateur" users may not be applied by those with specialist knowledge.

It is feasible to conjecture that certain products could be supplied in many of the categories identified in the Directive, dependent purely on the marketing position of those marketing the item.

WG3 have considered that all T1 items should be labelled with a phrase to the effect.

"This product may be used by persons with specialist knowledge at reduced safety distances"

But consider that this would be impractical or undesirable because:

- It may encourage consumers to apply reduced safety distances.
- It would also be applicable to the Cat 1/2/3 vs Cat 4 situation and the P1 vs P2 situation.
- It would also apply to T2 users using cat 1/2/3 or P1 items.
- It would require more text on an already cramped label.

WG3 would request that this issue is addressed in Member states and that "professional" users may use other items utilising their specialist knowledge to ensure a low risk to persons and property.

22 Resolutions made to CEN TC 212

The following resolutions have been made in order to clarify the points addressed in this report.

Table 6 — WG3 Resolutions submitted to CEN TC 212

Resolution Number	Description	Comments
01/2008	to ask the EC via CEN TC 212 to consider if prepared pyrotechnic substances (e.g. smoke pellets or binary mixtures) should be considered within the scope of preparing Standards for T1/T2 pyrotechnic articles and if so to prepare suitable guidance.	Agreed unanimously
02/2008	to ask the EC via CEN TC 212 to consider that some commonly used commercial theatrical items already containing small amounts of high explosives (e.g. flame projectors and bullet hits) be included within the scope of preparing Standards for T1/T2 pyrotechnic articles and if so to prepare suitable guidance (NB comparison with automotive airbags) – Section 4 a/b of the ESRs.	Agreed unanimously Subject to subsequent proposals from TC 212
03/2008	to ask the EC via CEN TC 212 to consider that for the purposes of developing Standards WG3 will adopt the following definitions. T1 – pyrotechnic articles or prepared pyrotechnic substances for stage use which present a low hazard. T2 – pyrotechnic articles or prepared pyrotechnic substances or Theatrical Pyrotechnics which do not meet all the requirements for T1 for stage use which are intended for use only by persons with specialised knowledge.	Agreed unanimously Subsequently agreed unanimously at TC 212
04/2008	Minimum Safety Distance(s) -Labeling Requirements. For T1 – accept there may be more than one distance. For T2 – adopt WG2 approach and recommend the use of “Standard Performance Parameter(s)”.	Agreed unanimously Subsequently agreed unanimously at TC 212
05/2009	WG3 asks CEN TC/212 to take forward the Technical Report they have developed to a final vote.	Agreed unanimously
06/2009	WG3 has identified the following work items necessary for the development of T1/T2 Standards Terminology Categorisation Requirements Labelling Test methods and asks CEN TC/212 to proceed with authorisation of these work items.	Agreed unanimously

23 Acknowledgements

WG3 would like to acknowledge the support of the following bodies/persons in development of this report.

- WG2 Secretariat and WG5 Convenor - Pierre Thebault
- CEN Secretariat
- Members of WG3 and their network of expertise outside CEN

24 Outline of future work

The following work items have been identified for completion of the Standard:

- terminology;
- categorisation;
- requirements;
- labelling;
- test methods.

WG3 have identified possible project leaders for each of these work items.

The following is an outline of the proposed development timescale for development of the Standard for T1/T2 products outlined above. This proposal may be modified according to decisions by CEN TC 212.

Approx Date	**Work**	**Comments**
Mid 2009	Demonstration to be arranged for T1/T2 products	For WG3 members and other interested parties in CEN TC 212 and invited guests
End 2009	Work items in progress	
Mid 2010	1st draft Standard complete	
End 2010	2nd draft Standard complete	
Mid 2011	3rd draft Standard complete	
End 2011	Final draft version of Harmonized Standards for T1/T2 products and submission to public comment	To allow for comments prior to publication and to allow producers time to adapt and test products to the new Standards before the mandatory date (July 2013)
Mid 2012	Revisions	
End 2012	Final publication	
4 July 2013	Directive comes into force for T1/T2 pyrotechnic articles	

This page has been intentionally left blank

BSI - British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: +44 (0)20 8996 9000. Fax: +44 (0)20 8996 7400.

BSI offers members an individual updating service called PLUS which ensures that subscribers automatically receive the latest editions of standards.

Buying standards

Orders for all BSI, international and foreign standards publications should be addressed to Customer Services. Tel: +44 (0)20 8996 9001. Fax: +44 (0)20 8996 7001 Email: orders@bsigroup.com You may also buy directly using a debit/credit card from the BSI Shop on the Website http://www.bsigroup.com/shop

In response to orders for international standards, it is BSI policy to supply the BSI implementation of those that have been published as British Standards, unless otherwise requested.

Information on standards

BSI provides a wide range of information on national, European and international standards through its Library and its Technical Help to Exporters Service. Various BSI electronic information services are also available which give details on all its products and services. Contact Information Centre. Tel: +44 (0)20 8996 7111 Fax: +44 (0)20 8996 7048 Email: info@bsigroup.com

Subscribing members of BSI are kept up to date with standards developments and receive substantial discounts on the purchase price of standards. For details of these and other benefits contact Membership Administration. Tel: +44 (0)20 8996 7002 Fax: +44 (0)20 8996 7001 Email: membership@bsigroup.com

Information regarding online access to British Standards via British Standards Online can be found at http://www.bsigroup.com/BSOL

Further information about BSI is available on the BSI website at http://www.bsigroup.com.

Copyright

BSI Group
Headquarters 389
Chiswick High Road,
London, W4 4AL, UK
Tel +44 (0)20 8996 9001
Fax +44 (0)20 8996 7001
www.bsigroup.com/
standards