BS EN 16263-3:2015

BSI Standards Publication

Pyrotechnic articles — Other pyrotechnic articles

Part 3: Categories and types

bsi.

National foreword

This British Standard is the UK implementation of EN 16263-3:2015.

BSI, as a member of CEN, is obliged to publish EN 16263-3:2015 as a British Standard. However, attention is drawn to the fact that during the development of this European Standard the UK committee voted against its approval as a European standard. The UK committee submitted a negative vote due to the criteria relating to the kinetic energy of projected objects, including fragments, which determine whether an article is categorized as P1 or P2 (see 6.2.3.7), and the corresponding test method in EN 16263-4:2015. The UK committee is of the opinion that these are not sufficiently rigorous to minimize the risk of possible injury to users and bystanders for all articles within the scope of the standard. The UK committee is actively engaged in seeking amendments to EN 16263-3:2015 and EN 16263-4:2015 in order to address this issue and testing has been carried out in the United Kingdom to support this initiative. In the meantime, the UK committee recommends that people supplying pyrotechnic articles (i.e. placing pyrotechnic articles on the market) that are intended to produce fragments or projected objects ensure that:
- they have assessed the potential for those fragments or projected objects to cause injury to users and bystanders;
- they provide appropriate information to users, including specifying collective measures and suitable personal protective equipment, that will allow users to take appropriate precautions to protect both themselves and bystanders.

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.

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Pyrotechnische Gegenstände - Sonstige pyrotechnische Gegenstände - Teil 3: Kategorien und Typen

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

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Contents

Page

European foreword

This document (EN 16263-3:2015) has been prepared by Technical Committee CEN/TC 212 “Pyrotechnic articles”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2016, and conflicting national standards shall be withdrawn at the latest by February 2016.

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, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA or Annex ZB, which are an integral part of this document.

This European standard is one of the series of standards as listed below:

— EN 16263-1*, Pyrotechnic articles — Other pyrotechnic articles — Part 1: Terminology;*

— EN 16263-2*, Pyrotechnic articles — Other pyrotechnic articles — Part 2: Requirements;*

— EN 16263-3*, Pyrotechnic articles — Other pyrotechnic articles — Part 3: Categories and types;*

— EN 16263-4*, Pyrotechnic articles — Other pyrotechnic articles — Part 4: Test methods;*

— EN 16263-5*, Pyrotechnic articles — Other pyrotechnic articles — Part 5: Minimum labelling requirements and instructions for use.*

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard defines the procedure for categorization of other pyrotechnic articles except pyrotechnic articles for vehicles, ignition devices and cartridges for powder actuated tools (PAT).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16263-1:2015, *Pyrotechnic articles — Other pyrotechnic articles — Part 1: Terminology*

EN 16263-4:2015, *Pyrotechnic articles — Other pyrotechnic articles — Part 4: Test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16263-1:2015 apply.

4 Generic types

Other pyrotechnic articles shall belong to one of the following generic types:

4.1
flare
article consisting of a light and/or radiated heat producing pyrotechnic composition, with or without a casing, with or without means of ignition

4.2
flash device
article consisting of a casing and flash powder, with or without a means of ignition, all assembled in one piece ready for firing

4.3
gas generator
article consisting of a pyrotechnic composition designed to generate gases, with or without a casing, with or without an ignition device

4.4
heater
article containing a pyrotechnic composition designed to generate heat

4.1
torche et flamme
article constitué d'une composition pyrotechnique émettant de la lumière et/ou de la chaleur, avec ou sans corps, avec ou sans moyen d'allumage

4.2
article flash
article constitué d'un corps et de poudre flash, équipé de son moyen propre d'amorçage ou non, le tout assemblé dans un seul objet prêt à tirer

4.3
générateur de gaz
article constitué d'une composition pyrotechnique conçue pour générer des gaz, avec ou sans corps, avec ou sans système d'initiation

4.4
réchauffeur/générateur thermique
article contenant une composition pyrotechnique conçue pour générer de la chaleur

4.1
Fackel
Gegenstand, bestehend aus pyrotechnischem Satz, der Licht und/oder Wärmestrahlung erzeugt, mit oder ohne Gehäuse, mit oder ohne Anzündvorrichtung

4.2
Blitzkartusche
Gegenstand, bestehend aus einem Gehäuse und Blitzsatz, mit oder ohne Anzündvorrichtung, bei dem alle Teile zu einem einzigen Stück zusammengebaut sind, das bereit zum Anzünden ist

4.3
Gasgenerator
Gegenstand, bestehend aus einem pyrotechnischen Satz, der darauf ausgelegt wurde, Gase zu erzeugen, mit oder ohne Gehäuse, mit oder ohne Anzündmittel

4.4
Aufheizer
Gegenstand, der einen pyrotechnischen Satz enthält, der darauf ausgelegt wurde, Wärme zu erzeugen

4.5

other cartridge

(except flash device)

article comprising a cup containing means of ignition, projecting charge and effect to be projected, and designed to be fired from a device having the means of holding the cartridge and providing the stimulus to function the means of ignition

4.5

autre cartouche

(sauf cartouche flash)

article comprenant une coupelle contenant un moyen d'allumage, une charge de chasse et un effet destiné à être projeté, et conçu pour être tiré à partir d'un dispositif capable de retenir la cartouche et de délivrer le stimulus qui initie le fonctionnement du moyen d'allumage

4.5

andere Kartusche

(außer Blitzkartusche)

Gegenstand, der aus einem Becher besteht, der die Anzündvorrichtung, die Treibladung und den hinauszuschleudernden Effekt enthält, und zum Anzünden von einer Vorrichtung aus, die die Kartusche aufnimmt und den Anzündimpuls liefert, um ausgelöst zu werden, ausgelegt ist

4.6

pyromechanical device

article consisting of mechanically mobile parts which are driven by the reaction of a pyrotechnic composition, with no or limited effect outside the device

4.6

pyromécanisme

article constitué de pièces mécaniquement mobiles qui sont mises en mouvement par une composition pyrotechnique, avec un effet limité voire nul à l'extérieur du produit

4.6

pyromechanisches Gerät

Gegenstand, der aus beweglichen mechanischen Teilen besteht, welche durch die Reaktion eines pyrotechnischen Satzes angetrieben werden, mit keiner oder einer begrenzten Wirkung außerhalb des Gegenstandes

4.7

pyrotechnic liquid disperser

article containing a charge of pyrotechnic composition or unit which ejects or disperses a liquid or gel without forming aerosol as its principal effect

4.7

disperseur pyrotechnique de liquide

article contenant une charge de composition pyrotechnique ou un élément qui, pour principal effet, éjecte ou disperse sans former d'aérosol un liquide ou un gel

4.7

pyrotechnischer Flüssigkeitszerstäuber

Gegenstand, der eine Ladung pyrotechnischen Satzes oder eine Einheit enthält, die als Haupteffekt eine Flüssigkeit oder ein Gel ausstößt oder zerstäubt, ohne dass dabei Aerosol gebildet wird

4.8

rocket and rocket motor

respectively, article which is propelled by one or more rocket motors, and article consisting of a pyrotechnic composition, generally a solid propellant, either contained or not in a casing fitted with one or more nozzles

4.8

fusée et moteur fusée

la fusée est un article propulsé par un ou plusieurs moteurs. Le moteur fusée est un article constitué d'une composition pyrotechnique, généralement un propergol solide, contenu ou non dans un corps équipé d'une ou plusieurs tuyères

4.8

Rakete und Raketenmotor

Gegenstand, der von einem oder mehreren Raketenmotor(en) angetrieben wird bzw. Gegenstand, der aus einem pyrotechnischen Satz, allgemein einer festen Treibladung besteht, die sich entweder in einem Gehäuse oder keinem Gehäuse mit einer Düse oder mehreren Düsen befindet

Note 1 to entry: Rocket motors which are not intended for model rockets, but are designed and intended for use as components of pyrotechnic articles are “semi-finished pyrotechnic product” and need to comply with the corresponding categorization criteria. All other rocket motors are subject to Directive 93/15/EEC.

Note 1 à l’article : Les moteurs fusée qui ne sont pas destinés à être utilisés sur des modèles réduits de fusées mais qui sont destinés à être utilisés comme composant d’un article pyrotechnique appartiennent au type générique « produit pyrotechnique semi-fini » et doivent satisfaire les critères de catégorisation correspondants. Tous les autres moteurs fusée sont soumis à la Directive 93/15/EEC.

Anmerkung 1 zum Begriff: Raketenmotoren, die nicht für Modellraketen vorgesehen sind, sondern zur Verwendung als Bestandteile pyrotechnischer Gegenstände ausgelegt und vorgesehen sind, sind „pyrotechnische Halbfertigerzeugnisse“ und müssen mit den entsprechenden Kategorisierungskriterien übereinstimmen. Alle weiteren Raketenmotoren unterliegen der Richtlinie 93/15/EWG.

4.9

semi-finished pyrotechnic product

article made of or containing pyrotechnic composition, with or without means of ignition, which is designed not to function by itself but requires inclusion or installation in or assembly with other parts to exhibit the intended performance characteristics and to achieve the intended effect

4.9

produit pyrotechnique semi-fini

article constitué de ou contenant une composition pyrotechnique, équipé ou non d’un moyen d’amorçage, qui n’est pas conçu pour être utilisé en propre mais nécessite son intégration ou son assemblage avec d’autres éléments pour développer les caractéristiques attendues et obtenir l’effet souhaité

4.9

pyrotechnisches Halbfertigerzeugnis

Gegenstand, der aus einem pyrotechnischen Satz besteht oder pyrotechnischen Satz enthält, mit oder ohne Anzündvorrichtung, der darauf ausgelegt ist, nicht für sich selbst auszulösen, sondern einen Einbau oder eine Installation oder einen Zusammenbau mit anderen Teilen erfordert, um die gewünschten Leistungsmerkmale hervorzubringen und den beabsichtigten Effekt zu erzielen

Note 1 to entry: The definition applies to articles the performance characteristics of which cannot be verified independently from the articles they are designed and intended to be included in.

Note 1 à l’article : La définition s’applique aux articles dont les caractéristiques de performance ne peuvent être vérifiées indépendamment des articles auxquels ils sont conçus et destinés à être inclus.

Anmerkung 1 zum Begriff: Die Definition gilt für Gegenstände, deren Leistungsmerkmale nicht unabhängig von den Gegenständen verifiziert werden können, für die sie konstruktionsbedingt vorgesehen sind und in die sie aufgenommen werden sollen.

Note 2 to entry: Products which are placed on the market composed of separate parts designed to be assembled before use are not considered as “semi-finished pyrotechnic products”.

Note 2 à l’article : Les produits placés sur le marché en plusieurs parties destinées à être assemblées avant utilisation ne sont pas considérés comme des « produits pyrotechniques semi-finis ».

Anmerkung 2 zum Begriff:
Produkte, die aus gesonderten Teilen bestehend auf den Markt gebracht werden, die darauf ausgelegt sind, dass sie vor Gebrauch zusammengebaut werden, werden nicht als „pyrotechnische Halbfertigerzeugnisse“ betrachtet.

4.10

smoke / aerosol generator

article consisting of a pyrotechnic composition designed to generate smoke or aerosol, with or without a casing and with or without a means of ignition

4.10

fumigène et générateur d’aérosol

article constitué d’une composition pyrotechnique destinée à produire de la fumée ou un aérosol, équipé ou non d’un corps, équipé ou non d’un moyen propre d’initiation

4.10

Rauch-/Aerosol-Generator

Gegenstand, der aus einem pyrotechnischen Satz besteht und dazu bestimmt ist, Rauch oder Aerosol zu erzeugen, mit oder ohne Gehäuse und mit oder ohne Anzündvorrichtung

4.11
sound emitter
article designed to emit sounds through the ignition of the pyrotechnic composition(s) it contains

4.11
émetteur sonore
article conçu pour émettre des sons ou des bruits par l'allumage de la ou des composition(s) qu'il contient

4.11
Schallerzeuger
Gegenstand, der darauf ausgelegt ist, durch die Zündung des/der darin enthaltenen pyrotechnischen Satzes/Sätze Schall abzugeben

5 Subtypes

Each other pyrotechnic article belongs to a generic type as defined in Clause 4.

These generic types can contain the following subtypes:

5.1
actuator
article containing a pyrotechnic composition and a means of ignition, producing mechanical effect by means of gas production

Note 1 to entry: Typical effects are: activate (press, hit, push, pull), unlock/open, lock/close, separate, weld/join fasten/ penetrate…

Note 2 to entry: It is a subtype of the generic type "pyromechanical device".

5.1
actionneur
article contenant une composition pyrotechnique et un moyen d'allumage, produisant un effet mécanique par production de gaz

Note 1 à l'article : Les effets typiques sont : actionner (comprimer, frapper, pousser, tirer), déverrouiller/ouvrir, verrouiller/fermer, souder/joindre, séparer, attacher/pénétrer…

Note 2 à l'article : Il constitue une sous-catégorie du type générique « pyromécanisme ».

5.1
Aktuator
Gegenstand, der einen pyrotechnischen Satz und eine Anzündvorrichtung beinhaltet, um einen mechanischen Effekt durch Gaserzeugung zu erzielen

Anmerkung 1 zum Begriff: Typische Effekte sind: Aktivieren (Drücken, Schlagen, Schieben, Ziehen), Entriegeln/Öffnen, Verriegeln/ Schließen, Trennen, Schweißen/ Verbinden, Befestigen/Durchdringen…

Anmerkung 2 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „pyromechanisches Gerät".

5.2
aircraft flare
flare designed to be fixed to or launched from an aircraft

Note 1 to entry: It is a subtype of the generic type "flare".

5.2
torche et flamme aérienne
torche et flamme destinées à être fixées sur ou larguées à partir d'un aéronef

Note 1 à l'article : Il constitue une sous-catégorie du type générique « torche et flamme ».

5.2
Flugzeugfackel
Fackel, die dazu bestimmt ist, an einem Flugzeug angebracht oder vom Flugzeug aus gestartet zu werden

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Fackel".

5.3

consolidated grain

solid charge of pyrotechnic composition which is given an intended shape, volume and density during the manufacturing process by means of an appropriate method such as pressing, casting, moulding, extrusion or rolling

Note 1 to entry: The surface of the consolidated grain can be primed to facilitate its ignition or partially inhibited to fix its burning behaviour over a given time frame. It may be supplied within or mechanically linked to a mechanical part which acts as a casing, support or fixing element.

Note 2 to entry: It is a subtype of the generic type “semi-finished pyrotechnic product”.

5.3

bloc (de composition)

bloc solide de composition pyrotechnique mis en forme, au volume et à la densité voulus, au moyen de procédés de production adaptés tels que la compression, la coulée, le moulage, l’extrusion ou la dragéification

Note 1 à l’article : La surface du bloc peut être amorcée afin de faciliter son allumage, ou partiellement inhibée afin de maîtriser ses caractéristiques de combustion dans une gamme de durée donnée. Le bloc peut être approvisionné en l’état ou intégré dans un élément mécanique jouant le rôle d’une enveloppe, d’un support ou d’un élément de fixation.

Note 2 à l’article : Il constitue une sous-catégorie du type générique « produit pyrotechnique semi-fini ».

5.3

verfestigtes Korngefüge

feste Ladung eines pyrotechnischen Satzes, welcher während des Herstellungsprozesses mittels eines geeigneten Verfahrens wie z. B. Pressen, Gießen, Formpressen, Strangpressen oder Walzen eine vorgesehene Form, ein vorgesehenes Volumen und eine vorgesehene Dichte gegeben wird

Anmerkung 1 zum Begriff: Die Oberfläche des verfestigten Korngefüges kann entsprechend vorbereitet sein, um die Zündung zu erleichtern oder sie kann teilweise mit Inhibitoren versehen sein, um das Brennverhalten über einen bestimmten zeitlichen Rahmen festzusetzen. Es kann direkt in ein mechanisches Teil integriert oder mit einem solchen mechanisch verbunden sein, das als Gehäuse, Halterung oder Befestigungselement dient.

Anmerkung 2 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „pyrotechnisches Halbfertigerzeugnis“.

5.4

fast-lock device

article containing a pyrotechnic composition and a means of ignition, producing the desired mechanical effect (unlock/open, separate/disjoin), e.g. by rupturing a component of the article

Note 1 to entry: It is a subtype of the generic type “pyromechanical device”.

5.4

déverrouilleur rapide

article contenant une composition pyrotechnique et un moyen d’allumage, produisant l’effet mécanique désiré (déverrouiller/ouvrir, séparer/disjoindre), par exemple par rupture d’un composant de l’article

Note 1 à l’article : Il constitue une sous-catégorie du type générique « pyromécanisme ».

5.4

Schnellauslösevorrichtung

Gegenstand, der einen pyrotechnischen Satz und eine Anzündvorrichtung enthält, die den gewünschten mechanischen Effekt erzeugt (entriegeln/öffnen, teilen/trennen) z. B. durch Zerbrechen einer Komponente des Gegenstandes

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „pyromechanisches Gerät“.

5.5

hand-held flare

flare designed to be held in the hand

Note 1 to entry: It is a subtype of the generic type “flare”.

5.5

torche manuelle

torche destinée à être tenue à la main

Note 1 à l’article : Elle constitue une sous-catégorie du type générique « torche et flamme ».

5.5

Handfackel

Fackel, die dazu bestimmt ist, in der Hand gehalten zu werden

Anmerkung 1 zum Begriff Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Fackel“.

5.6

hand-held rocket

article operated by hand and fitted with a rocket motor in order to exhibit a light, sound or smoke effect at a distance in the air

Note 1 to entry: The definition applies to other uses of hand-held rockets than signalling under SOLAS regulation (not subject to Directive 2007/23/EC and then to the present standard), such as anti-hail, pest-killing, plant-care applications, etc.

Note 2 to entry: It is a subtype of the generic type “rocket and rocket motor”.

5.6

fusée à main

article mis en œuvre à la main et équipé d’un moteur fusée de façon à produire un effet lumineux, sonore ou fumigène à distance dans l’air

Note 1 à l’article : La définition s’applique à d’autres utilisations des fusées à main que la signalisation soumise à la réglementation SOLAS (non soumise à la Directive 2007/23/CE et donc à la présente norme), telles que les applications paragrêle, antiparasitaires, phytosanitaires, etc.

Note 2 à l’article : Il constitue une sous-catégorie du type générique « fusée et moteur fusée ».

5.6

handgehaltene Rakete

Gegenstand, der von Hand betätigt wird und mit einem Raketenmotor ausgerüstet ist, um Licht-, Geräusch- oder Raucheffekte in einem bestimmten Abstand in der Luft zu erzeugen

Anmerkung 1 zum Begriff: Diese Definition gilt für andere Anwendungen von handgehaltenen Raketen als die Signalisierung nach der SOLAS-Regularien (die nicht Gegenstand der Richtlinie 2007/23/EG und somit auch nicht der vorliegenden Norm sind), wie z. B. Anti-Hagel-Anwendungen, Anwendungen zur Schädlingsbekämpfung, Pflanzenschutzanwendungen usw.

Anmerkung 2 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Rakete und Raketenmotor“.

5.7

line-thrower

gas generating pyrotechnic device used to project or propel a projectile with line(s) attached

Note 1 to entry: It is a subtype of the generic type “rocket and rocket motor” or “gas generator”.

5.7

lance-câble

article générateur de gaz, destiné à projeter ou propulser un projectile relié à un ou plusieurs filin(s)

Note 1 à l’article : Il constitue une sous-catégorie du type générique « fusée et moteurs fusée » ou « générateur de gaz ».

5.7

Leinenwurfgerät

gaserzeugendes pyrotechnisches Gerät, das dazu verwendet wird, einen Flugkörper auszustoßen oder anzutreiben, welcher mit einer oder mehreren Leine(n) verbunden ist

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Rakete und Raketenmotor“ oder „Gasgenerator“.

5.8

model rocket and model rocket motor

rocket and rocket motor for small-size simulation of rocket and rocket motors for entertainment and private use

Note 1 to entry: It is a subtype of the generic type “rocket and rocket motor”.

5.8

modèle réduit de fusée et moteur de modèle réduit de fusée

fusée et moteur fusée pour simulation à échelle réduite de fusées et moteurs fusées pour divertissement et usage privé

Note 1 à l’article : Il constitue une sous-catégorie du type générique « fusée et moteurs fusée ».

5.8

Modellrakete und Modellraketenmotor

Rakete und Raketenmotor zur kleinformatigen Simulation von Raketen und Raktenmotoren für Unterhaltungszwecke und zur privaten Nutzung

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Rakete und Raketenmotor“.

5.9

power device

article containing pyrotechnic composition(s) designed to generate gases or a pressure impulse in a short time, including power cartridges

Note 1 to entry: It is a subtype of the generic type “gas generator”

5.9

dispositif de puissance ou de pression

article contenant une ou des compositions pyrotechniques conçu pour générer des gaz ou une impulsion de pression dans un temps court. Il s’agit notamment des cartouches de puissance

Note 1 à l’article : Il constitue une sous-catégorie du type générique « générateur de gaz ».

5.9

Kraftelement

Gegenstand, der einen oder mehrere pyrotechnische(n) Satz/Sätze enthält und darauf ausgelegt ist, Gase oder einen Druckimpuls in einer kurzen Zeit zu erzeugen, einschließlich Kraftkartuschen

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Gasgenerator“.

5.10

projecting cartridge

cartridge projecting an effect specially designed for a specific technical use

Note 1 to entry: It is a subtype of the generic type “other cartridge” or “gas generator”, as appropriate.

5.10

cartouche propulsive

cartouche projetant un effet spécialement conçu pour un usage technique spécifique

Note 1 à l’article : Elle constitue une sous-catégorie du type générique « autre cartouche » ou « générateur de gaz », selon les cas.

5.10

Antriebskartusche

Kartusche, die einen Effekt antreibt und speziell für eine bestimmte technische Anwendung ausgelegt ist

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „andere Kartuschen“ oder „Gasgenerator“, wie jeweils zutreffend.

5.11

propelled signal

article containing a rocket motor which propels a charge of pyrotechnic composition which generates light, sound, or smoke for the purpose of signalling. It does not include signal cartridges

Note 1 to entry: It is a subtype of the generic type “rocket and rocket motor” and any appropriate generic type according to the type of principal effect.

5.11

signal propulsé

article constitué d’un moteur fusée qui propulse une charge de composition pyrotechnique générant de la lumière, du bruit ou de la fumée dans un but de signalisation. Ce type générique n’inclut pas les cartouches de signalisation

Note 1 à l’article : Il constitue une sous-catégorie du type générique « moteur et moteur fusée » et tout autre type générique approprié en relation avec l’effet principal.

5.11

angetriebenes Signalmittel

Gegenstand, der einen Raketenmotor enthält, der eine Ladung eines pyrotechnischen Satzes antreibt, der zum Zwecke der Signalgebung Licht, Geräusche oder Rauch erzeugt. Er umfasst keine Signal-kartuschen.

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Rakete und Raketenmotor“ und jedes geeigneten anderen Gegenstandstypen je nach Art der Hauptwirkung .

5.12

pyrotechnic fire-fighting device

article containing a pyrotechnic composition which produces or disperses a fire extinguishing agent

Note 1 to entry: It is a subtype of the generic type “gas generator” or “smoke /aerosol generator” or “pyrotechnic liquid disperser”.

5.12

produit pyrotechnique de lutte contre le feu

article contenant une composition pyrotechnique qui produit ou disperse un agent extincteur de feu

Note 1 à l’article : Il constitue une sous-catégorie du type générique « générateur de gaz » ou « générateur de fumée » ou « disperseur pyrotechnique de liquide».

5.12

pyrotechnisches Brandbekämpfungsgerät

Gegenstand, der einen pyrotech-nischen Satz enthält, und ein Feuerlöschmittel erzeugt oder verteilt

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Gasgenerator“ oder „Rauch-/Aerosol-Generator“ oder „pyrotechnischer Flüssigkeitszerstäuber“.

5.13

reactive target

article containing pyrotechnic composition which, when struck by an impacting projectile, produces light, heat, sound, sparks or smoke or a combination of two or more of these effects to record a "hit"

Note 1 to entry: It is a subtype of the appropriate generic types according to the principal effects.

5.13

cible réactive

article contenant une composition pyrotechnique qui, lorsqu'il est frappé par un projectile impactant, produit de la lumière, de la chaleur, un son, des étincelles ou de la fumée ou une combinaison d'un ou plusieurs de ces effets pour marquer un « coup au but »

Note 1 à l'article : Il constitue une sous-catégorie des types génériques appropriés selon les effets principaux.

5.13

reaktive Zielscheibe

Gegenstand, der einen pyrotechnischen Satz enthält, und beim Auftreffen eines Aufschlaggeschosses Licht, Wärme, Schall, Funken oder Rauch oder eine Kombination aus zwei oder mehreren dieser Effekte erzeugt, um einen „Treffer" aufzuzeichnen

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp der entsprechenden Gegenstandstypen je nach Hauptwirkung.

5.14

rock-breaking cartridge

gas generating cartridge designed and intended to break different materials (usually rocks or concrete)

Note 1 to entry: It is a subtype of the generic type "gas generator".

5.14

cartouche de dérochage

cartouche génératrice de gaz définie et destinée à briser différents matériaux (habituellement des roches ou du béton)

Note 1 à l'article : Elle constitue une sous-catégorie du type générique « générateur de gaz ».

5.14

steinbrechende Kartusche

gaserzeugende Kartusche, die darauf ausgelegt und vorgesehen ist, unterschiedliche Stoffe zu brechen (gewöhnlich Gestein oder Beton)

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Gasgenerator".

5.15

signal cartridge

cartridge projecting a light, sound, or smoke effect for the purpose of signalling

Note 1 to entry: It is a subtype of the generic type "other cartridge".

5.15

cartouche de signalisation

cartouche projetant un effet lumineux, sonore ou fumigène dans le but de donner un signal

Note 1 à l'article : Elle constitue une sous-catégorie du type générique « autre Cartouche ».

5.15

Signalkartusche

Kartusche, die ein Licht-, Schall- oder Raucheffekt zum Zweck der Signalgebung ausstößt

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „andere Kartuschen".

5.16

simulation device

article containing a means of ignition, a charge of pyrotechnic composition and an effect intended for use in paintball, airsoft or other similar activities; designed to be placed or thrown

Note 1 to entry: It is a subtype of the generic type "Other cartridge" or "smoke generator" or "pyrotechnic liquid disperser" or other generic types according to the principal effect.

5.16

produit de simulation

article contenant un moyen d'amorçage, une charge de composition pyrotechnique et un effet, destiné à être utilisé dans des activités de paintball, airsoft ou autres activités similaires ; conçu pour être posé ou lancé à la main

Note 1 à l'article : Il constitue une sous-catégorie du type générique « autre cartouche » ou « fumigène » ou « disperseur pyrotechnique de liquide » ou autre type générique en relation avec l'effet principal.

5.16

Gegenstand zur Simulation

Gegenstand, der eine Anzündvorrichtung, eine Ladung pyrotechnischen Satzes und einen Effekt beinhaltet und dessen Zweck es ist, in Paintball, Softair oder sonstigen ähnlichen Aktivitäten eingesetzt zu werden; er ist zum Platzieren oder Werfen ausgelegt

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „andere Kartuschen" oder „Rauchgenerator" oder „pyrotechnischer Flüssigkeitszerstäuber" oder um andere Gegenstandstypen je nach seiner Hauptwirkung.

EXAMPLES

paintball cartridge

cartridge containing paint sachet and/ or paintballs for a marking effect

airsoft cartridge

cartridge containing airsoft pellets and/or other pellets to give a low hazard fragmentation effect

other projectile cartridge

cartridge containing other fills, such as paper or powder, to give a low hazard fragmentation effect

5.17

star

consolidated grain, intended to burn in the air and give an individual visual effect

Note 1 to entry: A star may have various shapes: spherical, cylindrical, cubic, rectangular, etc. It can include a charge of pyrotechnic composition to break it in fragments during its combustion to improve or modify the visual effect (“fragmentation” star).

Note 2 to entry: It is a subtype of the generic type “semi-finished pyrotechnic product”.

5.18

surface flare

flare designed to be placed on the ground

Note 1 to entry: It is a subtype of the generic type “flare”.

EXEMPLES

cartouche paintball

cartouche contenant un sachet ou des billes de peinture pour marquage de cible

cartouche airsoft

cartouche contenant des pastilles airsoft ou toutes autres pastilles générant des effets de fragmentation à faible risque

autre cartouche à projectiles

cartouche contenant d’autres charges, telles que du papier ou de la poudre, générant des effets de fragmentation à faible risque

5.17

étoile

bloc de composition, destiné à brûler à l’air libre afin de produire un effet visuel

Note 1 à l’article : Une étoile peut avoir plusieurs formes, sphérique, cylindrique, cubique, parallélépipédique. Elle peut comporter une charge de composition pyrotechnique destinée à la fragmenter en cours de sa combustion afin d’augmenter ou de modifier l’effet visuel (étoile à « fragmentation »).

Note 2 à l’article : Elle constitue une sous-catégorie du type générique « produit pyrotechnique semi-fini ».

5.18

torche et flamme terrestre

torche et flamme conçues pour être placées sur le sol

Note 1 à l’article : Elles constituent une sous-catégorie du type générique « torche et flamme ».

BEISPIELE

Paintball-Kartusche

Kartusche, die Farbbeutel und/oder Farbkugeln enthält, um einen Markierungseffekt zu erzielen

Softair-Kartusche

Kartusche, die Softair-Granulat und/oder andere Granulate enthält, um einen Splittereffekt mit geringer Gefahr zu erzeugen

andere Antriebskartusche

Kartusche, die andere Füllstoffe enthält, z. B. Papier oder Pulver, um einen Splittereffekt mit geringer Gefährdung zu erzeugen

5.17

Stern

verfestigtes Korngefüge, das dafür vorgesehen ist, in der Luft abzubrennen und einen individuellen visuellen Effekt zu erzeugen

Anmerkung 1 zum Begriff: Ein Stern kann verschiedene Formen haben: kugelförmig, zylinderförmig, kubisch, rechteckig usw. Er kann eine Ladung eines pyrotechnischen Satzes enthalten, wodurch er während des Abbrennens in Fragmente auseinander bricht, um den visuellen Effekt zu verbessern oder zu verändern („Splitter“-Stern).

Anmerkung 2 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „pyrotechnisches Halbfertigerzeugnis“.

5.18

Bodenfackel

Fackel, die dazu bestimmt ist, auf dem Boden platziert zu werden

Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Fackel“.

5.19 **thermite cartridge** cartridge containing a pyrotechnic substance designed to produce heat and molten metal	**5.19** **cartouche à thermite** cartouche contenant une substance pyrotechnique destinée à produire de la chaleur et du métal fondu	**5.19** **Thermit-Kartusche** Kartusche, die eine pyrotechnische Substanz enthält und dazu ausgelegt ist, Wärme und geschmolzenes Metall zu erzeugen
Note 1 to entry: It is a subtype of the generic type “heater”.	Note 1 à l’article : Elle constitue une sous-catégorie du type générique « réchauffeur/générateur thermique ».	Anmerkung 1 zum Begriff: Es handelt sich dabei um einen Untertyp des Gegenstandstyps „Aufheizer“.

6 Categorization criteria

6.1 General

Any other pyrotechnic article shall belong to one of the following categories:

— Category P1: pyrotechnic articles other than fireworks and theatrical pyrotechnic articles which present a low hazard;

— Category P2: pyrotechnic articles other than fireworks and theatrical pyrotechnic articles which are intended for handling or use only by persons with specialist knowledge.

Determination whether an article is to be categorized as P1 or P2 is made by application of a sequence of general and specific criteria (cf. 6.2) to identify the hazard level of the article in normal and foreseeable conditions of use.

6.2 Criteria for categorization

6.2.1 General

A pyrotechnic article can only be categorized as P1, if the manufacturer or importer categorises it as P1 and the categorization is confirmed by the notified body responsible for the EC-type examination.

The manufacturer or importer may categorize the article as P2, even though it might fulfil all requirements for P1.

If an article does not fulfil one or more of the categorization criteria for P1 applicable to its generic type, it shall be categorized P2.

The flow chart given in Figure A.1 specifies the way the sequence of criteria is organized. It may be used as an explanatory complement to 6.2.2 to 6.2.4. These criteria are organized in four steps:

— Step 1 “Nominal Use” deals with the level of knowledge that is needed to use the article in a correct manner;

— Step 2 “Handling” deals with the level of knowledge that is needed to handle the article safely;

— Step 3 “Setting” deals with the conditions which shall be addressed when preparing the ignition of the article;

— Step 4 “Functioning” deals with the nature, performance and related hazard level of the effects produced by the article; both principal and secondary effects are considered.

6.2.2 General criteria

6.2.2.1 Specialist knowledge [steps S 1.1, S 2.1, S 2.2, S3.1, S 3.2, S3.3, S 3.4, S3.6, S3.7, S4.12 and S4.13 of Figure A.1]

The article shall be assigned to category P2 when additional technical knowledge is required that is not possible to include in the instructions for use for the safe handling and use of the article and/or the mandatory use of specified equipment, installation and/or ancillary device where appropriate.

6.2.2.2 Pyrotechnic operation [step S 1.2 of Figure A.1]

The article shall be assigned to category P2 if the setting or using of the article requires a pyrotechnic operation as defined in EN 16263-1:2015, 2.2.46.

6.2.2.3 Net Explosive Content [step S 1.3 of Figure A.1]

The article shall be assigned to category P2 if the net explosive content (NEC) of the article, as defined in EN 16263-1:2015, 2.2.30, is higher than the values given in Table 1, column “NEC” for the individual generic types.

6.2.2.4 Sensitiveness [steps S 3.4, S 3.5 of Figure A.1]

In the case where the user might have possible contact with bare pyrotechnic composition or if composition is likely to become exposed during normal conditions of handling or use, the article shall be assigned to category P2 when the self-ignition temperature of the considered composition is less than or equal to 150 °C or when its sensitiveness, when tested in accordance with EN 16263-4:2015, 5.13.1, meets one of the following requirements:

— sensitiveness to friction: less than or equal to 80 N;

— sensitiveness to impact: less than or equal to 8 J;

— sensitiveness to electrostatic discharge: less than or equal to 200 mJ.

6.2.2.5 Safety firing distances and hazard zone

6.2.2.5.1 General

For the purpose of categorization, two safety distances shall be taken into account:

— the “safety firing distance” as defined in EN 16263-1:2015, 2.2.50;

— the hazard zone as defined in EN 16263-1:2015, 2.2.20, when there are effects that are remote from the firing point.

6.2.2.5.2 Safety firing distance [step S 3.1, S4.3 of Figure A.1]

The safety firing distance or the performance data for its calculation are given by the manufacturer on the label or in the instructions for use.

The decision whether the considered articles are categorised as P1 or P2 depends on the following aspects:

— in those cases where specific protective measures are required and those protective measures are either not readily available to the public (e.g. not sold in the consumer market or limited to persons with specialist knowledge) or not supplied with the article by the manufacturer or importer, the article shall be categorised as P2;

— in the case where the safety firing distance shall be calculated by the user from performance data, the article shall be categorized as P2.

6.2.2.5.3 Hazard zone [steps S3.1, S 4.3, S 4.4 of Figure A.1]

For P1 articles, manufacturers or importers shall provide the end users with the dimensions and shape of the hazard zone as illustrated in Figure 1.

In the case where the dimensions and/or shape of the hazard zone shall be calculated by the user from performance data, the article shall be categorized as P2.

The above criteria are not applicable to life saving devices.

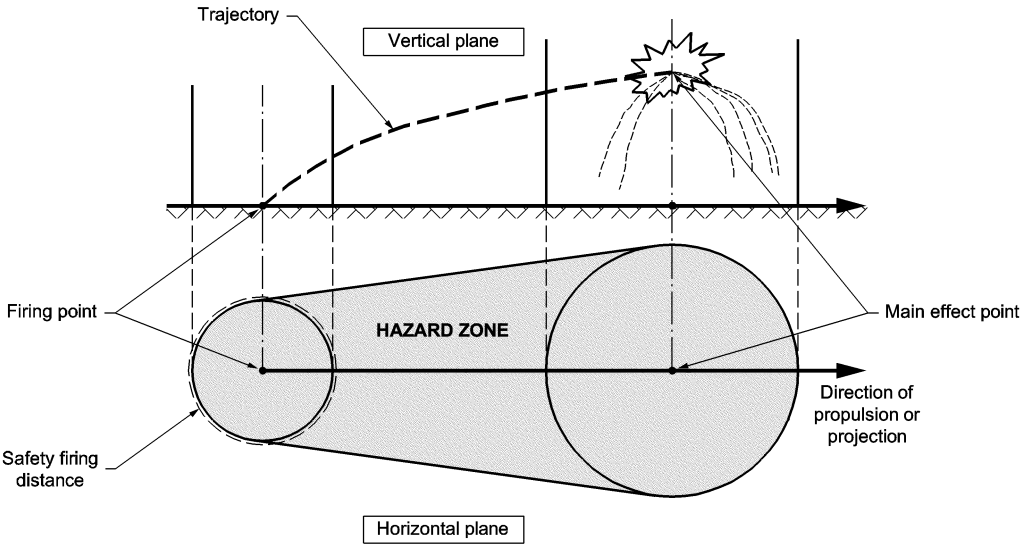


Figure 1 — Control of the direction of propulsion or projection

6.2.3 Specific criteria [Functioning step of Figure A.1]

6.2.3.1 General

In the following criteria, both principal and secondary effects as defined in EN 16263-1:2015, 2.2.40 and 2.2.51 shall be considered.

6.2.3.2 External effect [steps S 4.2 of Figure A.1]

If skin contact cannot be avoided, **the article shall be assigned to category P2** if, when tested in accordance with EN 16263-4:2015, 5.13.2, the external surface temperature of the handling part of the article exceeds 45 °C.

When the article is intended to be handled during a short time before being placed on the ground or in a specified ancillary device, the above requirement only applies during the hand-held phase.

6.2.3.3 Falling debris [steps S 4.5, S 4.6, S4.7 of Figure A.1]

The article shall be assigned to P2 category:

— if one or more pieces of falling debris exceed 1 kg; or

— if one or more pieces of falling debris land outside the hazard zone with a calculated impact kinetic energy exceeding 1 J; or

— if the calculated impact kinetic energy of any individual debris exceeds 5 J.

The presence of falling debris inside and outside the hazard zone shall be confirmed by recording during function tests according to EN 16263-4:2015, 5.10.

The following formulae give an equivalent approach corresponding to the energy limit of 1 J and 5 J.

For rigid debris (e.g. hard plastic, ceramic, metallic or wooden fragments), the size and shape of foreseeable falling debris which land outside the hazard zone (e.g. rocket motor casing) shall comply with the following formulae:

— when the velocity of falling debris is not controlled by specific means such as parachutes (e.g. free fall debris):

$$M \geq 0,78 \times C_x^{1/2} \times S_d^{1/2}$$ for the energy limit of 5 J

$$M \geq 0,35 \times C_x^{1/2} \times S_d^{1/2}$$ for the energy limit of 1 J

where

M is the mass of the falling debris (kg);

C_x is the drag coefficient of the falling debris. If the actual value is unknown, use the value in Table B.1 for the corresponding shape and orientation;

S_d is the reference surface (projected frontal area) of the falling debris (m^2).

— when the velocity of falling debris is controlled by specific means such as parachutes (i.e. C_x = 1):

$$M \geq 0,78 \times S_p^{1/2}$$ for the energy limit of 5 J

$$M \geq 0,35 \times S_p^{1/2}$$ for the energy limit of 1 J

where

M is the mass of the falling debris (kg);

S_p is the surface of the parachute (m^2).

For resilient debris (e.g. fragments of soft or flexible plastic, felt or cardboard fragment, fabric) the mass M may be weighted with a coefficient < 1 depending on the nature of the debris.

When necessary, static tests of the articles may be made to determine or confirm the possible size, shape and energy of falling debris.

NOTE In the case of fragments, the calculation will be made from assumptions on the mass, dimensions and shape of the largest foreseeable fragment.

6.2.3.4 Thermal effect [steps S 4.8 and S 4.9 of Figure A.1]

The article shall be assigned to category P2 if one of the following criteria is met:

— when the exposure time t(s) is lower than or equal to 120 s:

$$D = \int_0^t \Phi(t)^{4/3} \cdot dt > 125 \left(\left[\text{kW/m}^2 \right]^{4/3} \cdot \text{s} \right)$$

— when the exposure time t(s) is greater than 120 s:

$$\Phi_m > 1,0 \left(\text{kW/m}^2 \right)$$

where

D is the thermal dose effect at the safety firing distance $(kW/m^2)^{4/3}.s$;

t is the time during which the user is exposed to the thermal flux in seconds (exposure time). The exposure time may be different from the burning time of the article e.g. the duration of the hand-held phase when the article is intended not to be handled during the complete burning time;

$\Phi(t)$ is the "density of heat flow rate" measured during exposure time (kW/m^2);

Φ_m is the mean value of the "density of heat flow rate" measured during exposure time at the safety firing distance (kW/m^2).

NOTE The above thermal dose criterion requires the measurement (when tested in accordance with EN 16263–4:2015, 5.10) or the calculation (see Annex C) of the "density of heat flow rate" versus "duration of the exposure".

6.2.3.5 Burning rate of Flares and Smoke/Aerosol generators [steps S 4.10 and S 4.11 of Figure A.1]

The article shall be assigned to category P2 if, when tested in accordance with EN 16263-4:2015, 5.10, the burning rate exceeds:

$BR = NEC / t > 10$ g/s

where

BR is the burning rate of the article (g/s) as defined in EN 16363-1:2015, 2.2.7;

NEC is the net explosive content of the article (g) as defined in EN 16363-1:2015, 2.2.30;

t is the burning time of the article (s).

This requirement applies to flares and devices designed to release smokes or aerosols in the atmosphere for signalling, marking, testing, pest control, and similar applications. It does not apply to gas generators, rocket motors, propelled articles, life saving devices and pyrotechnic fire-fighting devices.

6.2.3.6 Acoustic pressure level effects [step S 4.14 and S 4.15 of Figure A.1]

The article shall be assigned to category P2 if, when tested in accordance with EN 16263-4:2015, 5.5, the C-weighted sound pressure level $L_{C,peak}$ is higher than 145 dB or the maximum A-weighted impulse sound pressure level (L_{Almax}) exceeds 120 dB, except when wearing hearing protection is required by the instructions for use.

The above criterion is not applicable to life saving devices and firefighting devices.

When the intrinsic noise level of the article is effectively damped in all circumstances of normal use, (e.g. mole killing devices, rock breaking cartridges), measurements shall be made in damped conditions representative of normal use as defined by manufacturers' or importers' specifications.

For projected or propelled articles which produce a noise outside the safety firing distance, measurements shall be made either at a known distance from the main effect point or by keeping the articles at a fixed point during the function test. The sound level at the boundary of the hazard zone shall be calculated from these measurements according to the following formula:

$$L_S = L_M + 20 \times \log_{10}\left(\frac{r_M}{r_S}\right)$$

where

L_S sound pressure at the boundary of the hazard zone;

L_M sound pressure level, measured on the measuring point;

r_M measuring distance;

r_S distance between the main effect point and the closest point of the boundary of the hazard zone to the main effect point.

NOTE For sound emitters, the safety firing distance is not necessarily based on the acoustic level of the sound emitting charge. It might be based on other aspects which are typical of the normal use of the article, e.g. falling or projected debris or thermal effect.

6.2.3.7 Projected debris and fragments [steps S 4.18, S 4.19 of Figure A.1]

The article shall be assigned to category P2 if during testing according to EN 16263-4:2015, 5.15 (method A or B) or according to EN 16263-4:2015, 5.10 (high speed camera or video recording) either if the fragments perforate the specified witness screen or exhibit a kinetic energy higher than 5 J at the safety firing distance or if they exceed the categorization criteria of the possible other appropriate test methods.

6.2.3.8 Kinetic energy / Thrust [steps S 4.16, S4.17 of Figure A.1]

Gas generators shall be categorised as P2 if, during functioning according to EN 16263-4:2015, 5.10, the maximum motion of the article exceeds 15 m.

6.2.3.9 Semi-finished pyrotechnic products

Semi-finished product shall be categorised as P2, except when the application of the flowchart as presented in Annex A leads to its categorization as P1.

6.2.4 Specific criteria table [criteria versus generic type]

When an article does not fulfil one or more of the categorization criteria for P1 applicable to its generic type given in Table 1, it shall be categorized P2.

Table 1 — Criteria for P1 categorization

Generic type	NEC (6.2.2.3)	Burning rate (6.2.3.5)	External effect (6.2.3.2)	Kinetic energy/ Thrust (6.2.3.8)
Flare	≤ 2 kg	Projected or propelled: N/A Neither projected nor propelled: ≤ 10 g /s	≤ 45 °C (only applicable for hand-held flares, 5.5)	N/A
Flash device	≤ 4,0 g of nitrate/metal-based composition or ≤ 2,0 g of any other composition that produces a flash	N/A	N/A	N/A
Gas generator	None	N/A	N/A	No dangerous thrust: maximum motion < 15 m
Heater	≤ 2 kg	≤ 10 g/s	N/A	N/A
Other cartridge (except flash device)	≤ 5,0 g of black powder as projecting charge or mass of other pyrotechnic composition giving equivalent pressure. NEC of the effect charge ≤ 100 g	N/A	N/A	N/A (see limitation of the projecting charge)
Pyromechanical device	None	N/A	N/A	N/A
Pyrotechnic liquid disperser	Bursting charge ≤ 10 g	N/A	N/A	N/A
Rocket and rocket motor	Propelling charge ≤ 150 g (≤60 g for hand-held rockets) NEC of the effect charge ≤ 300 g (≤10 g for model rockets and ≤ 120 g for hand-held rockets)	N/A	N/A	N/A (Covered by NEC limit)
Semi-finished pyrotechnic product	Category P2, except when the application of the flowchart as presented in Annex A leads to its categorization as P1.			
Sound emitter	Reports: ≤ 10 g of black powder or any other composition that produces a report effect. Other sound emitters ≤ 10 g of sound generating (e.g. whistling) composition Propelled items: Propelling charge ≤ 10 g	N/A	N/A	N/A (Covered by NEC limit for propelled devices)
Smoke / aerosol generator	≤ 2,5 kg	Projected or propelled: N/A Neither projected nor propelled: ≤ 10 g /s	≤ 45 °C (Except when there is no skin contact during handling)	N/A

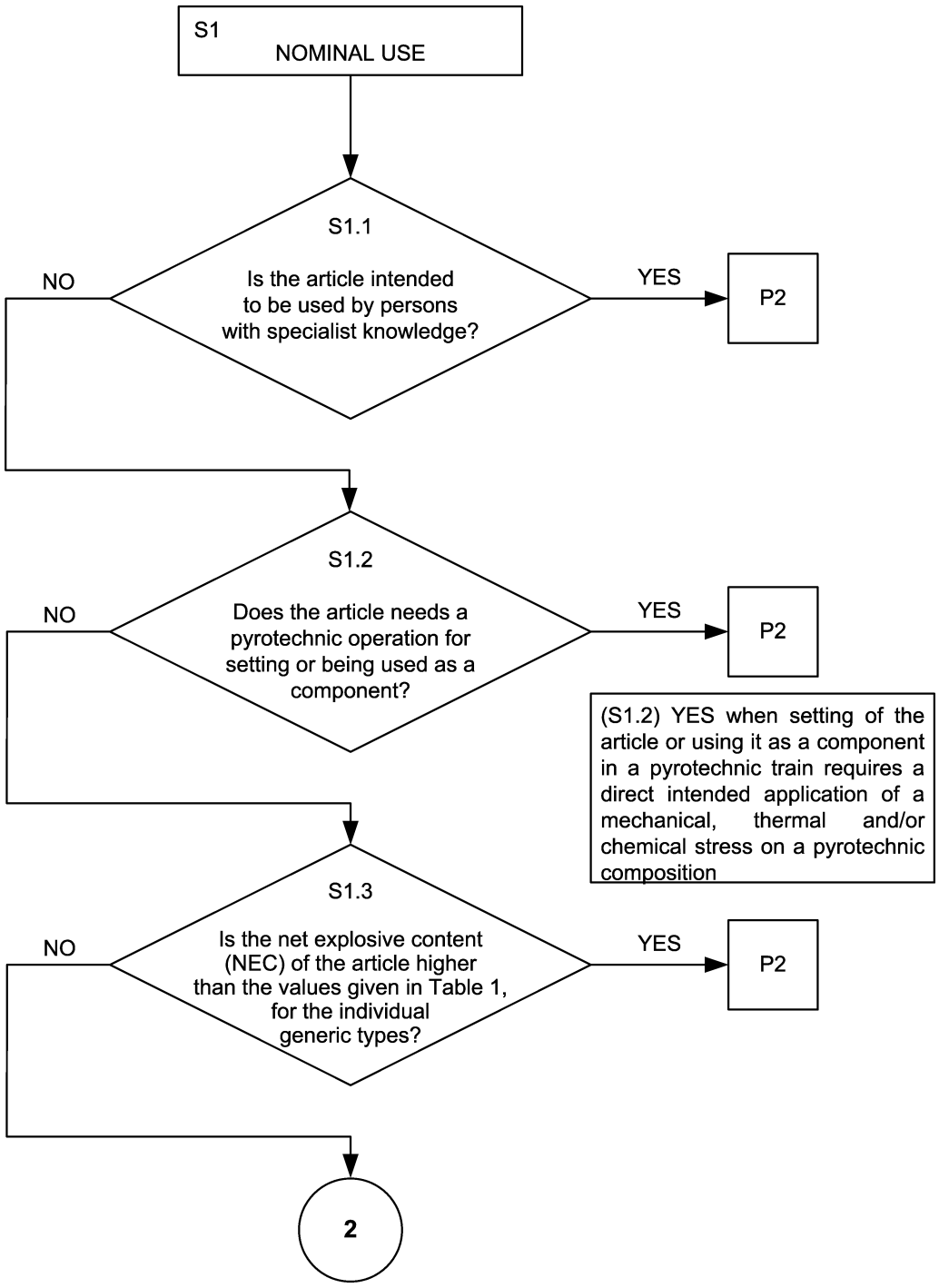
Generic type	**Thermal effect (6.2.3.4)**	**Acoustic pressure level effects (6.2.3.6)**	**Projected debris and Fragments (6.2.3.7)**	**Falling debris (6.2.3.3) (Not applicable to life saving articles)**
Flare	$D \leq 125$ [(W/ m^2)$^{4/3}$.s] (for $t \leq 120$ s.) or $\Phi_m \leq 1{,}0$ (kW/ m^2) (for $t > 120$ s.). Non applicable for projected or propelled flares	N/A	None	Projected or propelled flares: ≤ 1 kg and impact energy ≤ 5 J (≤1 J outside the hazard zone)
Flash device	N/A	Measured at the safety firing distance: $L_{CPEAK} \leq 145$ dB or $L_{AImax} \leq 120$ dB See special requirement for propelled or projected items	No fragments with kinetic energy greater than 5 J	Projected or propelled flash devices: ≤ 1 kg and impact energy ≤ 5 J (≤1 J outside the hazard zone)
Gas generator	N/A	N/A	There shall be no unintended fragments during normal functioning. Any intentional fragments shall not exhibit a kinetic energy greater than 5 J	N/A
Heater	$D \leq 125$ [(W/ m^2)$^{4/3}$.s] (for $t \leq 120$ s.) or $\Phi_m \leq 1{,}0$ (kW/ m^2) (for $t > 120$ s.)	N/A	There shall be no unintended fragments during normal functioning. Any intentional fragments shall not exhibit a kinetic energy greater than 5 J	N/A
Other cartridge (except flash device)	N/A	Measured at the safety firing distance: $L_{CPEAK} \leq 145$ dB or $L_{AImax} \leq 120$ dB See special requirement for propelled or projected items	N/A	Falling debris ≤ 1 kg and impact energy ≤ 5J (≤1 J outside the hazard zone)
Pyromechanical device	N/A	N/A	There shall be no unintended fragments during normal functioning. Any intentional fragments shall not exhibit a kinetic energy greater than 5 J	N/A

Generic type	**Thermal effect (6.2.3.4)**	**Acoustic pressure level effects (6.2.3.6)**	**Projected debris and Fragments (6.2.3.7)**	**Falling debris (6.2.3.3) (Not applicable to life saving articles)**
Pyrotechnic liquid disperser	N/A	Measured at the safety firing distance: L_{CPEAK} ≤ 145 dB or L_{AImax} ≤ 120 dB Not applicable to fire fighting devices and life saving devices	No fragments with kinetic energy greater than 5 J	N/A
Rocket and rocket motors	N/A	N/A	No fragments with kinetic energy greater than 5 J	Rockets: Falling debris ≤ 1 kg and impact energy ≤ 5 J (≤1 J outside the hazard zone)
Semi-finished pyrotechnic product	Generally categorized as P2: where appropriate use the flowchart presented in Annex A.			
Sound emitter	N/A	Measured at the safety firing distance: L_{CPEAK} ≤ 145 dB or L_{AImax} ≤ 120 dB See special requirement for propelled or projected items	No fragments with kinetic energy greater than 5 J	Projected or propelled items: Falling debris ≤ 1 kg and impact energy ≤ 5 J (≤1 J outside the hazard zone)
Smoke / aerosol generator	N/A	N/A	'There shall be no unintended fragments during normal functioning. Any intentional fragments shall not be of kinetic energy greater than 5 J	Projected or propelled items: Falling debris ≤ 1 kg and impact energy ≤ 5 J (≤1 J outside the hazard zone)

Annex A
(normative)

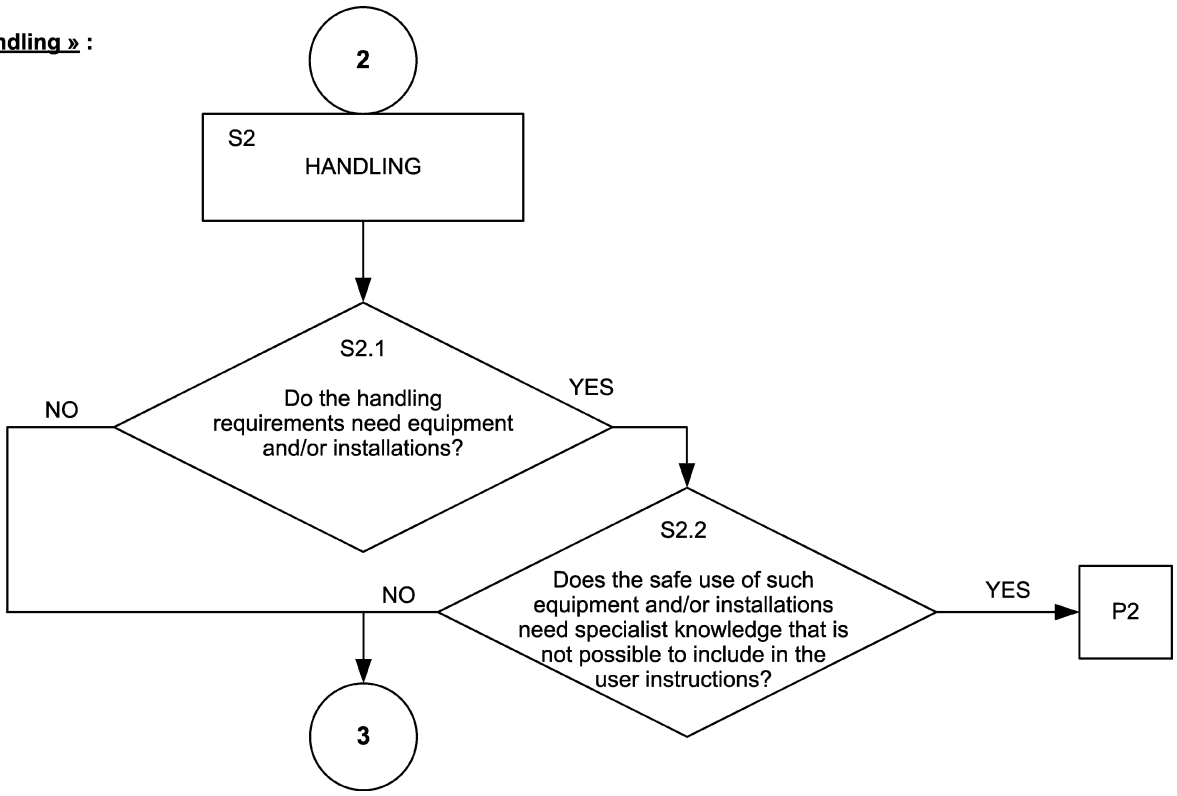
Flow chart

Step 1 « Nominal use » :

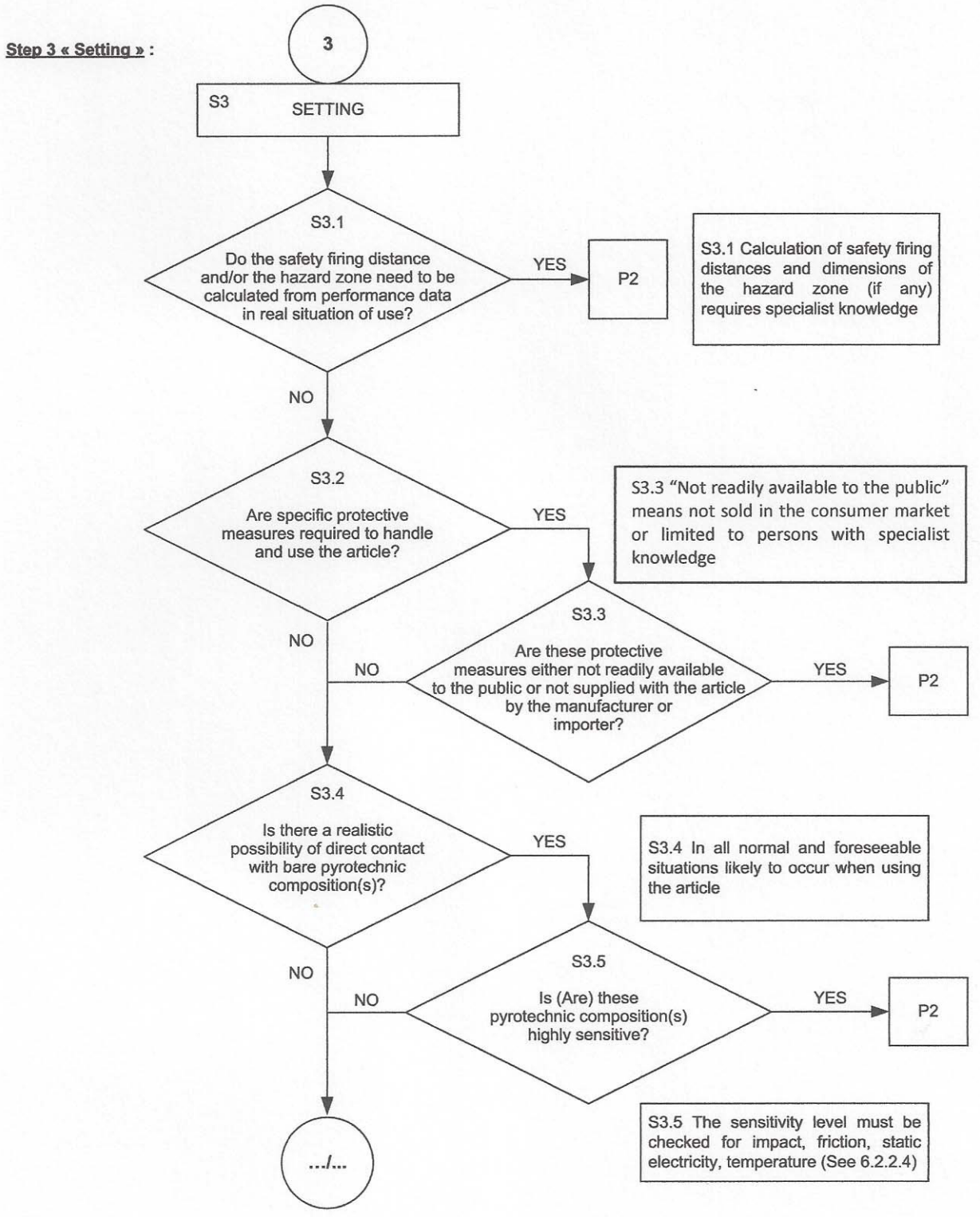


a) Flow chart (1 of 7)

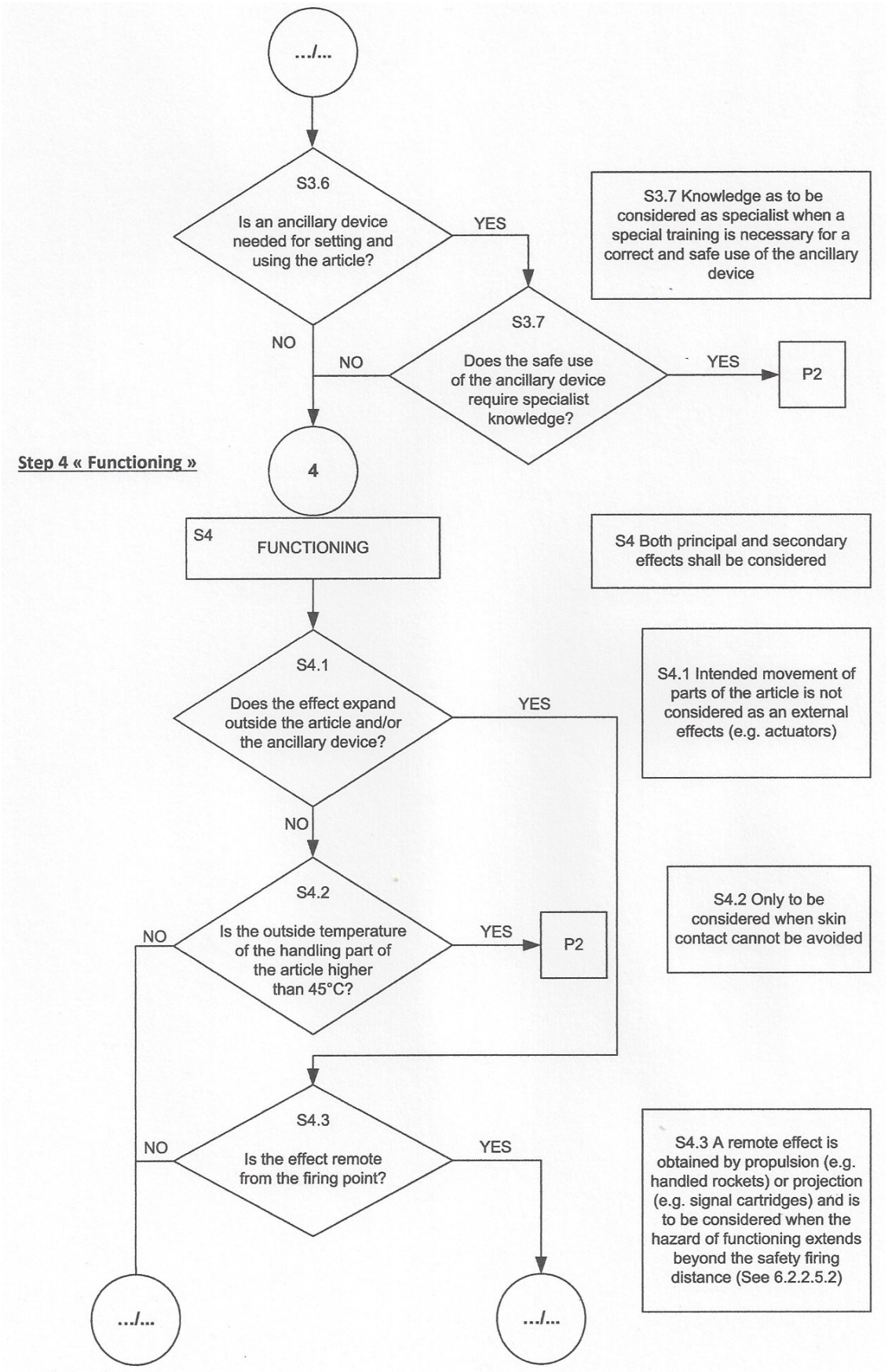
Step 2 « Handling » :



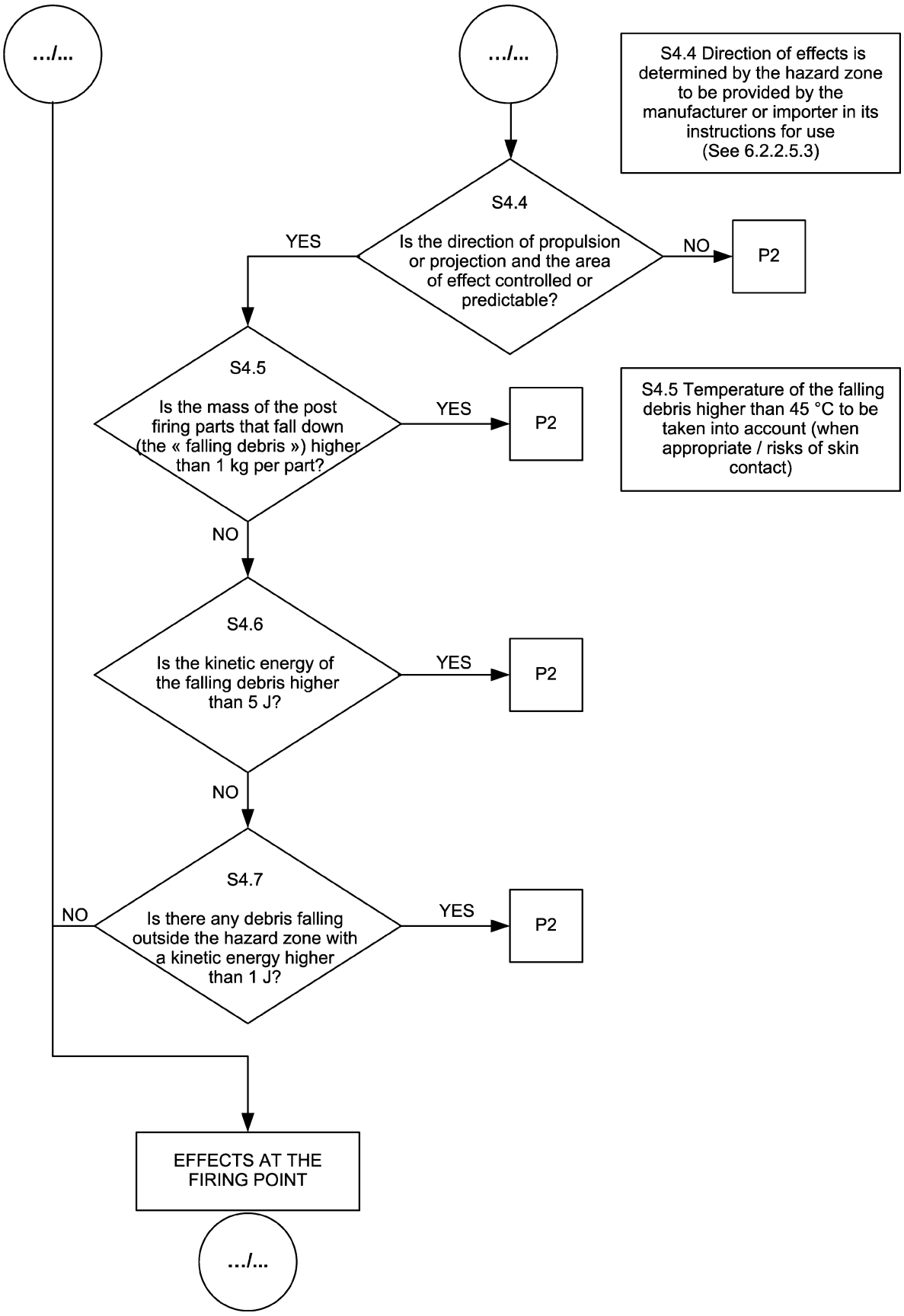
b) Flow chart (2 of 7)



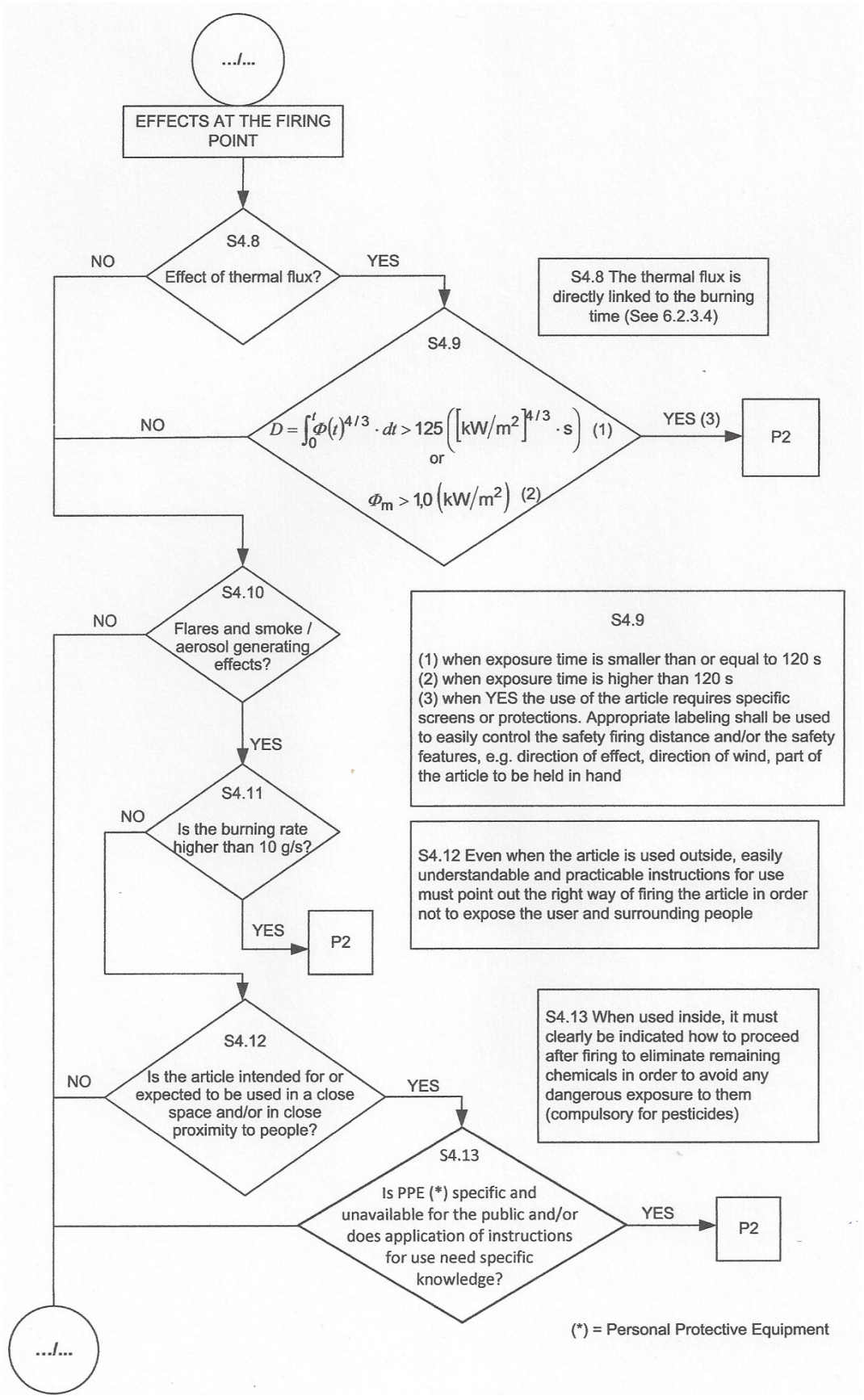
c) Flow chart (3 of 7)



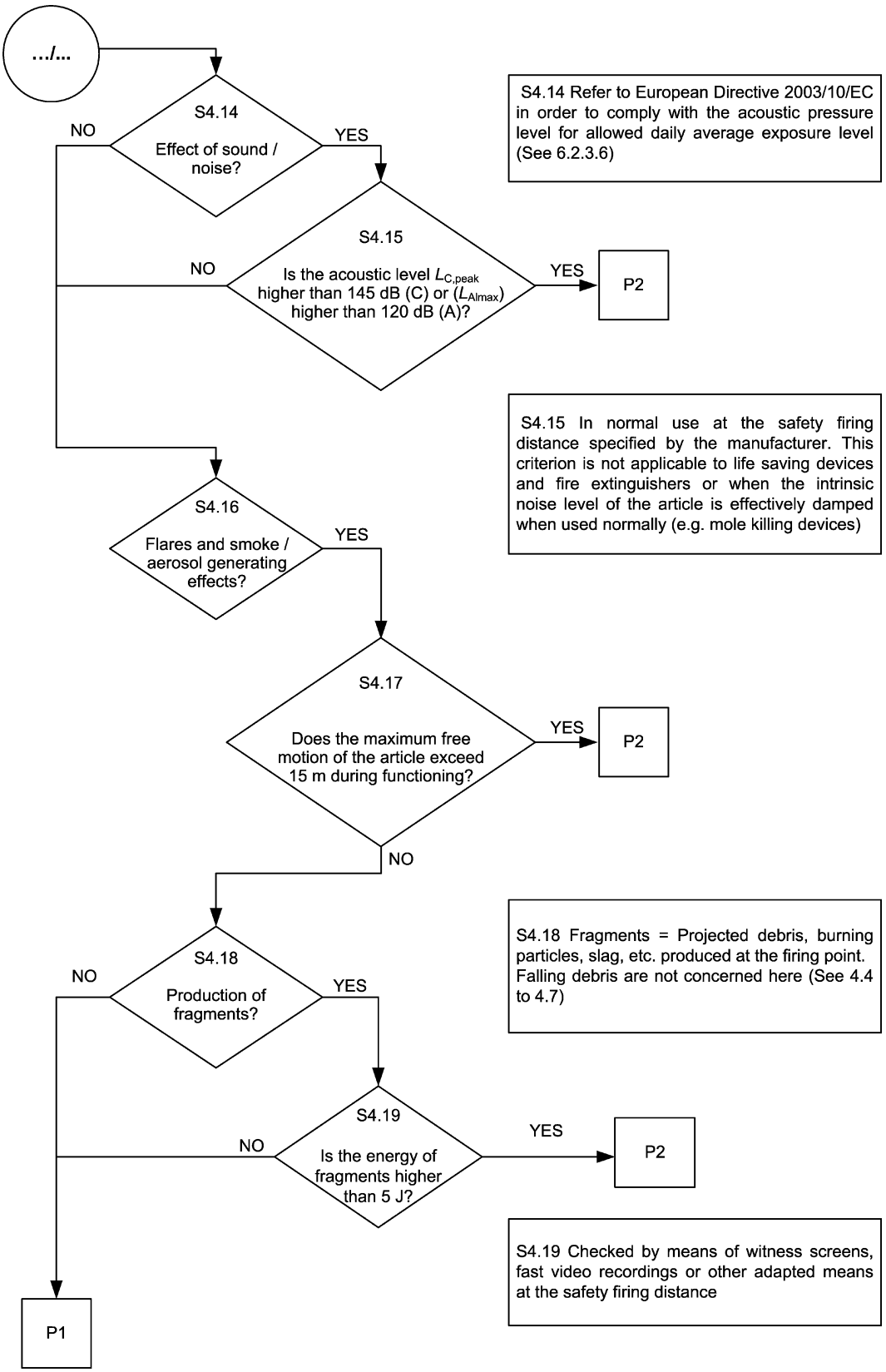
d) Flow chart (4 of 7)



e) Flow chart (5 of 7)



f) Flow chart (6 of 7)



g) Flow chart (7 of 7)

Figure A.1 — Flow chart

Annex B
(normative)

Value of the drag coefficient

Table B.1 — Value of the drag coefficient

Typical shapes	Drag coefficient
Laminar flat plate parallel to the flow	0,001
Turbulent flat plate parallel to the flow	0,005
Streamlined object	0,04
Smooth sphere	0,10
Half sphere	0,42
Rough sphere	0,48
Cone	0,50
Angled cube, i.e. point first	0,80
Long cylinder	0,82
Cube, flat face normal to the flow	1,05
Short cylinder	1,15
Wires and cables	1,0 to 1,3
Flat object perpendicular to flow	1,28

Annex C
(normative)

Calculation of the thermal dose

C.1 Method of calculation

For categorization, the calculation of the mean thermal flux or the thermal dose the user is submitted to at the safety firing distance (see 6.2.3.4) is necessary.

Thermal flux is calculated by Formula (C.1):

$$\Phi_m = \frac{1}{t_{\text{exp}}} \int_0^{t_{\text{exp}}} \Phi(t) \cdot dt \qquad \text{(C.1)}$$

Thermal dose is calculated by Formula (C.2):

$$D = \int_0^{t_{\text{exp}}} \Phi(t)^{4/3} \cdot dt \qquad \text{(C.2)}$$

where:

Φ_m is the mean value of the "density of heat flow rate" measured during exposure time at the safety firing distance (kW/m^2);

D is the thermal dose effect at the safety firing distance (kW/m^2)$^{4/3}$.s;

t_{exp} is the exposure time (seconds);

$\Phi(t)$ is the "density of heat flow rate" measured during exposure time (kW/m^2).

When $\Phi(t)$ is measured by means of a heat flux meter (EN 16263-4:2015, 4.20), Φ_m or D can be directly calculated from processing the recorded signal using an electronic integrator.

An alternative to such measurement consists in directly calculating Φ_m or D from construction and performance characteristics of the article as explained below.

The density of heat flow rate is given by the following formula:

$$\Phi(t) = \frac{\beta \cdot H}{4\pi \cdot R^2} \cdot q(t) \qquad \text{(C.3)}$$

as a function of:

β the ratio between radiation effect and global thermal effect;

H (J/g) the enthalpy of combustion of the product;

R (m) the distance between the source of the thermal effect and the target;

$q(t)$ (g/s) the mass of burnt pyrotechnic composition per unit of time.

When $q(t)$ is constant or can be approximated by a constant law of time, Formula (C.3) can be written as follows:

$$\Phi(t) = \frac{\beta \cdot H}{4\pi \cdot R^2} \cdot \frac{NEC}{t_c} \qquad \text{(C.4)}$$

where:

NEC is the net explosive content (g) of the pyrotechnic composition creating the thermal effect;

t_c is the effect time (s) of the pyrotechnic composition creating the thermal effect.

then:

$$\Phi_m = \frac{\beta \cdot H}{4\pi \cdot R^2} \cdot \frac{NEC}{t_c} \quad \text{(C.5)}$$

and:

$$D = \Phi_m^{4/3} \cdot t_{exp} \quad \text{(C.6)}$$

where:

t_{exp} is the exposure time (s).

When $q(t)$ is not constant or cannot be approximated by a constant law of time, similar formulae can be obtained mathematically. When no analytical solution can be found, Φ_m or D can be calculated from Formula (C.1) and Formula (C.2) on a personal computer by using a mathematical solver.

C.2 Typical values of the enthalpy of combustion

H can be determined by calorimetric analysis.

For pyrotechnical compositions, the average value of H is about 4 KJ/g.

Some products such as energetic propellants have H values about 6 KJ/g.

When calorimetric values of H are not available and in order to have a good safety margin, it is recommended to use an average value of 5 KJ/g.

C.3 Radiation part of the thermal flux

Only the radiation effect is considered as long as the user shall not have direct contact with the flame and combustion products generated by the combustion of the pyrotechnic compositions of the article.

The ratio between the global energy of the product and the radiation effect is admitted to be about 0,4.

C.4 Alternative criterion when $q(t)$ is constant or can be approximated by a constant law of time

— When the exposure time t_{exp} is lower than or equal to 120 s the article is assigned to category P2 if the thermal dose D complies with the following criterion:

$$D > 125 \ \left(\text{kW} / \text{m}^2\right)^{4/3} \text{s} \quad \text{(C.7)}$$

Using the above recommended values of β and H, Formula (C.6) and Formula (C.7) lead to the following criterion:

$$NEC > 235 \cdot R^2 \cdot \frac{t_c}{t_{exp}^{3/4}}$$

with NEC in grams, R in metres, t_{exp} and t_c in seconds.

— when the exposure time t_{exp} is greater than 120 s:

$$\Phi_m > 1,0 \text{ kW / m}^2 \quad \text{(C.8)}$$

Using the above recommended values of β and H, Formula (C.5) and Formula (C.8) leads to the following criterion:

$NEC > 6,28 \cdot R^2 \cdot t_c$

with NEC in grams, R in metres and t_c in seconds.

EXAMPLE A hand-held flare with an effect time of 8 min which, according to manufacturer's specification, is to be held with outstretched arm (R = 0,7 m) during an exposure time of 60 s maximum, will be categorized as P1 if the net explosive content creating the principal effect is lower than:

$NEC \leq 2\,570$ *g*

If the same hand-held flare is to be held during more than 2 min, its NEC limit will be:

$NEC \leq 1\,470$ *g*

Annex D
(informative)

Overview of essential safety requirements and corresponding clauses of all parts of EN 16263

The correspondence between the parts of EN 16263 and Directive 2007/23/EC on the placing on the market of pyrotechnic articles can be found in Annex ZA of each part of EN 16263.

Table D.1 gives an overview about all essential safety requirements and the corresponding clauses and subclauses of all parts of EN 16263.

Table D.1 — Overview of essential safety requirements and corresponding clauses of all parts of EN 16263

Essential Safety Requirements (ESR) of Directive 2007/23/EC	**Clause(s)/sub-clause(s) of**		
	EN 16263–2:2015	EN 16263–4:2015	EN 16263–5:2015
(1)	5.1, 5.7, 5.8, 6.2, 8, 9	5.4, 5.5, 5.6, 5.10, 5.11	
(2)	1, 4.2, 5.2, 8	5.2, 5.3	4.5
(3), 1st paragraph	5.1, 5.7, 5.8, 6.2, 8, 9	5.4, 5.5, 5.6, 5.10, 5.11	4.5
(3), 2nd paragraph	5.1, 5.4, 5.6, 5.7, 5.8, 8, 9	5.7, 5.8, 5.9, 5.10, 5.11, 5.16	
(3) (a)	1, 4.1, 4.4, 5.2, 6.1, 8, 9	5.2, 5.3	
(3) (b)	5.4, 5.5, 5.7, 5.8, 8, 9	5.7, 5.8, 5.9, 5.10	
(3) (c)	5.4, 5.5, 8, 9	5.7, 5.8, 5.9, 5.10, 5.16	
(3) (d)	4.1, 5.7, 5.8, 8	5.9	
(3) (e)	5.6, 7, 8	5.9, 5.16	
(3) (f)	5.8, 8	5.9, 5.10	
(3) (g)	4.3, 4.4, 8, 9	5.7, 5.8, 5.10.3.4, 5.12	4.5, 4.9
(3) (h)	4.2, 4.5, 5.3, 8, 9	5.14	4.5, 4.6, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13
(3) (i)	5.7, 5.8, 7, 8, 9	5.9	
(3) (j)	8, 9	5.7, 5.8	4.5
(3), last paragraph	5.4, 5.5, 8	5.2, 5.3	
(4)	See Annex ZB		
(5) B. (1)	1, 4, 5.2, 8, 9	5.4, 5.5, 5.6, 5.10, 5.11	
(5) B. (2)	4.4, 5.2, 8, 9	5.2, 5.3	4.5, 4.8, 4.9
(5) B. (3)	5.1, 8, 9	5.4, 5.5, 5.6, 5.10, 5.11	
(5) B. (4)	5.1, 5.7, 5.8, 6.2, 8, 9	5.7, 5.8, 5.9, 5.10, 5.11, 5.16	4.11

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

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the New Approach Directive 2007/23/EC on the placing on the market of pyrotechnic articles.

Once EN 16263-3 is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the normative clauses of EN 16263-3 confers, within the limits of the scope of EN 16263-3, a presumption of conformity with the corresponding Essential Requirements of that Directive and associated EFTA regulations.

WARNING — Other requirements and other EU Directives may be applicable to the product(s) falling within the scope of this standard.

Annex ZB
(informative)

Relationship between this European Standard and the Essential Requirements of EU Directive 2013/29/EU on the placing on the market of pyrotechnic articles

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association to provide a means of conforming to Essential Requirements of the Directive 2007/23/EC on the placing on the market of pyrotechnic articles, which is repealed by Directive 2013/29/EU.

Once EN 16263-3 is cited in the Official Journal of the European Union under that Directive and has been implemented as a national standard in at least one Member State, compliance with the clauses of EN 16263-3 confers, within the limits of the scope of EN 16263-3, a presumption of conformity with the requirements of that Directive and associated EFTA regulations.

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[4] EN 16263-2:2015, *Pyrotechnic articles — Other pyrotechnic articles — Part 2: Requirements*

[5] EN 16263-5:2015, *Pyrotechnic articles — Other pyrotechnic articles — Part 5: Minimum labelling requirements and instructions for use*

[6] prEN 16265, *Pyrotechnic articles — Other pyrotechnic articles — Ignition devices*

[7] Directive 2013/29/EU of the European Parliament and of the Council of 12 June 2013 on the harmonization of the laws of the Member States relating to the making available on the market of pyrotechnic articles (recast), OJL 178; 28.6.2013, available from http://eurlex.europa.eu/LexUriServ.do?uri=OJ:L:2013:178:0027:0065:en:PDF

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