

GOST R 51270-99

Group L75

STATE STANDARD OF THE RUSSIAN FEDERATION

PYROTECHNIC GOODS

General safety requirements

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OKSTU 7275

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Preface

1 DEVELOPED AND INTRODUCED by R&D Institute of Applied Chemistry (NIIPH)

2 APPROVED AND RELEASED by Resolution of Gosstandart of Russia no. 135 dated April 27, 1999

3 This standard incorporates the norms of [the Law of the Russian Federation "On Protection of Consumer Rights"](#)

4 FIRST RELEASE

5 EDITION (February of 2011) with [Revision 1](#) approved in June of 2010 (IUS 10-2010)

1 Scope

This standard covers pyrotechnic goods for household and technical application and establishes general safety requirements for development, manufacturing, transportation, storage, sale/distribution, use and disposal, conformity with which on voluntary basis may serve as evidence of compliance with respective technical regulations.

Section 1 (Revised edition, [Rev. 1](#)).

2 Normative references

This standard refers to the following norms:

[GOST 2.102-68](#) Unified system for design documentation. Types and sets of design documentations

[GOST 2.114-95](#) Unified system for design documentation. Specifications

[GOST 17527-2003](#) Package. Terms and definitions

[GOST 19433-88](#) Dangerous goods. Classification and marking

[GOST 12.4.026-2001](#) Occupational safety standards system. Safety colors, safety signs and signal marking. Purpose and rules of application. General technical requirements and characteristics. Methods of tests

[GOST R 51271-99](#) Pyrotechnic goods. Methods of certification tests

3 Terms, definitions and acronyms

The following terms with their respective definitions and acronyms are used in this standard:

- 3.1 **igniter**: Initiating device (electric squib and/or fuse) used for actuation of a pyrotechnic article (PA)
- 3.2 **ignition bursting charge**; IBC: Element of a firework article (FA) that ensures the preset spreading and ignition of a pyrotechnic element (PE)
- 3.3 **delay time**; DT: Time interval from the moment of initiation to the moment the operating PA provides an output
- 3.4 **delay element**: Ignition train element that provides a preset delay in transmitting an initiating stimulus to the connected element of PA or launch equipment (LE)
- 3.5 **initiating device**; ID: PA element that sets off the ignition train
- 3.6 **handling signs**: Images that illustrate proper methods of handling
- 3.7 **propellant charge**; PC: PA element that ensures ejection of PE with preset initial speed and engagement of further elements of the ignition train
- 3.8 **mortar**: LE element intended for propelling FA or PE in preset direction with preset initial speed
- 3.9 **ignition train**; IT: System of PA and LE elements that ensure sequential transmission of stimuli to initiate the necessary sequence of igniting PA munition
- 3.10 **danger zone**: Part of the space surrounding the operating pyrotechnic compound (PTC) and the article that contains it and inside which at least one hazard reaches a dangerous level
- 3.11 **hazard**: Specific effect created by pyrotechnic compounds and articles that contain them which, if it reaches a dangerous level, poses a threat for health, property and environment
- 3.12 **pyrotechnic article**; PA: Product intended for obtaining a necessary effect by means of firing/blasting PTC
- 3.13 **pyrotechnic goods**; PG: PTC and PA that contain them for household and technical use, including PTC for unaided application
- 3.14 **pyrotechnic compound**; PTC: Mix of components capable of unaided or environment-facilitated burning that generates gaseous and condensed products, thermal, luminous, and mechanical energy and provides diverse optical, electrical, baric and other special effects in the process of burning
- 3.15 **pyrotechnic element**; PE: PA component in the form of a charge or a device that produces a preset effect
- 3.16 **consumer package**: Package intended for packing and handing PA over to consumer
- 3.17 **fireworks display**: Mass entertainment event with the use of PA for technical use
- 3.18 **remote control device**; RCD: LE element that enables remote activation of ignition trains and PA at necessary moments of time and protects them from unauthorized triggering
- 3.19 **launch station**; LS: Set of mortars and guides for launching rigidly fixed on a common base
- 3.20 **launch equipment**; LE: Equipment intended for actuating PA
- 3.21 **firework article**; FA: PA of professional application intended for obtaining sound, light, smoke, special scenic and other effects during fireworks display

Section 3 (Revised edition, [Rev. 1](#)).

4 General

4.1 Pyrotechnic articles are fire-hazardous and/or explosion-hazardous. PA combustion products may cause negative effects on people and environment. External effects [EE (impact, heating, electromagnetic

radiation, detonation pulse, etc.)] may cause unauthorized triggering of PA or loss of their functional capacity if permissible EE levels are exceeded.

Exceeding the specified levels of external effects, misuse of articles or neglecting the user manual, as well as inconsistency of parameters and characteristics of PA and LE may lead to abnormalities, destruction and ejection of structural elements and burning PE outside the established danger zone, and origination of shock waves.

4.2 Depending on their intended use and design features, the action of PA is accompanied with one or more hazards (table 1) characterized by levels of danger.

Table 1 - Hazards and danger zones of pyrotechnic articles

Hazard	Key parameter, unit of measure	Danger level (zone size)
1 Flame or high-temperature jet of combustion products	Flame size, m	Whole flame
2 Scattered fire-hazardous structural elements (burning pellets, incandescent slags, sparks, etc.)	Burst radius, m	Whole area within the burst radius
3 Thermal (infrared) radiation	Surface density, W/m ²	540
4 Blast shock wave	Pressure, Pa	35·10 ³
5 Flying hitting fragments	Burst radius, m	Whole area within the burst radius
6 PA or PE moving due to initial ejection speed or reactive force	Kinetic energy, J	20
7 Acoustic emission	Sound level, dBA:	
	- transient	140
	- continuous	120
8 Optical emission	Flux density, J/m ²	1·10 ⁴
9 Aerosolized combustion or dispersion products	To be determined by normative and technical documentation for PA	
10 Specific influence of combustion products on humans and environment	Same	

When using protective means specified by PA technical documentation, the danger zone sizes are to be established with regard to the use of such means.

4.3 When working with PA, measures are to be taken to evacuate or safeguard people and property inside the danger zones.

4.4 Normative and technical documents for PG [standards, specifications, technical descriptions, application/use manuals] should contain:

- list of hazards of PA normally functioning also in emergency, sizes of danger zones;
- PG cargo hazard class;

- safety requirements (including fire safety) and rules for storage, transportation, and use of PA;
- methods of disposal of PA (used, failed, or past their shelf life);
- other requirements and limitations ensuing from the specifics of design, usage conditions, and intended application of PA.

4.1-4.4 (Revised edition, [Rev. 1](#)).

5 Classification of pyrotechnic articles

5.1 By application and by conditions of use, PA are subdivided in two groups:

- PA for household use, freely sold to the public, the handling of which requires no special knowledge or skills, and usage in compliance with the enclosed instructions for use ensures safety of people and no damage to property or environment outside their danger zones;
- PA for technical and special application, the handling of which requires special knowledge and skills, relevant qualification of performers/users and/or provision of certain technical fit-out conditions.

5.2 By the degree of potential danger in use, PA are subdivided into the following hazard classes:

- class I: PA in which the kinetic energy of motion is no higher than 0.5 J, there are no shock waves or fragments flying outside the danger zone, the acoustic emission at a distance of 0.25 m from the pyrotechnic articles does not exceed 125 dB, and the radius of the danger zone of other hazards is no greater than 0.5 m;
- class II: PA in which the kinetic energy of motion is no higher than 5 J, there are no shock waves or hitting fragments flying outside the danger zone, the acoustic emission at a distance of 2.5 m from the PA does not exceed 140 dB, and the radius of the danger zone of other hazards is no greater than 5 m;
- class III: PA in which the kinetic energy is higher than 5 J in directed motion and no more than 20 J in undirected motion, there are no shock waves or hitting fragments flying outside the danger zone, the acoustic emission at a distance of 5 m from the PA does not exceed 140 dB, and the radius of the danger zone of other hazards is no greater than 30 m;
- class IIIa: PA in which the kinetic energy is higher than 5 J in directed motion and no more than 20 J in undirected motion, there are no shock waves or hitting fragments flying outside the danger zone, the acoustic emission at a distance of 5 m from the PA does not exceed 140 dB, and the radius of the danger zone of other hazards is no greater than 20 m;
- class IV: PA that make no shock wave and whose danger zone radius of at least one of the other hazards is more than 30 m;
- class V: special PA and technical articles other than those in classes I to IV;
- class Va: PA the activation of which is accompanied with a shock wave (baric field with pressure level over 35 kPa) and/or flying hitting fragments with specific kinetic energy over 0.5 J/mm² to a distance more than 5 m.

(Revised edition, [Rev. 1](#)).

5.3 Cargos that contain PG are classified in accordance with appendix A.

(Added, [Rev. 1](#)).

6 Safety requirements

6.1 Pyrotechnic goods requirements

6.1.1 During development of PG, the nomenclature of hazards and the sizes of danger zones are to be minimized. The nomenclature of hazards and the sizes of danger zones of PTC are to be defined within a

specific PA.

(Revised edition, [Rev. 1](#)).

6.1.2 PG are to meet the safety requirements after exposure to EE attributable to the specified conditions of manufacturing, storage, transportation and use throughout the designated shelf life.

6.1.3 The PA package is to keep security of the PA and the marks on them as well as invariability of the safety characteristics throughout their shelf life.

Overpacks for household PA are to be subjected to fireproofing, contain flame suppressor powder (a substance that retards the burning process, such as dicyandiamide, thiourea, carbamide, oxamide, etc.) in an amount of 50 g/m³ but no less than 5 g per package and be able to withstand open flame for 3 s. The special fire safety symbol "Fireproofed package" is to be applied onto the containers according to [GOST R 12.4.026](#), appendix B, and the "Internal fireproofing" caption.

If necessary, the package may be divided by fire-retardant-impregnated cardboard partitions into cells with bagged organic flame suppressor placed in them in an amount of at least 5 g per bag to promote higher fire security of PA in storage.

6.1.4 PA of classes I-IV, when engaged from a built-in launching unit or from an external standard electrical detonator (type ED-8), should not detonate, and any accidental actuation of the article should not lead to abnormality (altered nomenclature of hazards and danger zone radius) of another article of the same type in immediate proximity to it (in the package).

The articles are not to require any maintenance works by the user. Function tests and continuity checks of electrical initiators in PA of classes II and III by the user shall be prohibited. Usage of electrical initiating systems in PA of class I is not allowed.

6.1.3, 6.1.4 (Revised edition, [Rev. 1](#)).

6.1.5 The design of PA intended for launching from hands or working in hands should preclude the influence of all hazards on the user, and additionally, for PA of classes I-III, the temperature of the surfaces in contact with the hand should not exceed 65°C.

Normative and technical documents for such PA should specify reasonable limitations to the recoil force (impulse) and the torque.

6.1.6 It must be ensured that remotely launchable PA are initiated from within the safety zone.

PA directly launchable by hand should have a delay element to ensure safe launching and make the manifestation of hazards delayed for a time necessary for the user to leave the danger zone of the starting portion of the actuated PA's trajectory. The speed of leaving should be assumed no greater than 1.5 m/s in this case.

The minimum delay time of PA of classes I-III should be no less than 0.2 s. Absence of delay elements is allowed for PA that, when activated, ensure safety of the user by their design features or by the danger zone size reduced to 0.5 m in enough time for the user to leave the danger zone specified for that PA.

6.1.7 The delay time for PA of classes II and III that create an effect on height (e.g. rockets, Roman candles, mini-fireworks, etc.) should be long enough for the operator to leave the danger zone of the launch (possible impact of ejection charge combustion products or resulting stream of fumes) and the initial portion of the trajectory.

6.1.6, 6.1.7 (Revised edition, [Rev. 1](#)).

6.1.8 Safety holdback units of PA initiation systems should be distinguishable and safe to remove.

6.1.9 Where delay elements with the time of delay longer than 10 s are used in PA of classes I-III, such time should be mentioned in the instructions for use.

6.1.10 PA that, owing to active ejection or reactive force, acquire kinetic energy values above 20 J, should be fitted with stabilizing and/or guiding fins to ensure that the deviation of flight from the intended direction is no greater than 7.5° at the starting portion (within 5 m from the launching point). The danger zone

radius of the starting portion of trajectory should not exceed 3 m.

6.1.11 PA that create effects at height are to burn down no lower than 3 m above the ground. This also concerns multi-element PA, in which all of the elements are to be activated. Possibility of unexploded or unburnt PE falling down to the ground within the danger zone and actions to be taken in this case should be specified in the operating instructions of the PA.

6.1.10, 6.1.11 (Revised edition, [Rev. 1](#)).

6.1.12 In order to minimize the possibility of injuring people, PA of classes I-III moving by means of reactive force or propelling device should have no sharp edges, be provided with protective caps and tips or made of shock-absorbing materials, and the specific kinetic energy of motion should not exceed 0.5 J/mm^2 .

6.1.13 PA for household use should not have a class of hazard higher than III. It is mandatory that each PA is provided with instruction for use with the wording on the danger of PA and limitations of its use in highlighted font. The instruction can be applied on the PA body or on its consumer package, provided that the text is clear and legible. The instruction can be enclosed to the PA, provided that they both have unambiguous identity marks.

6.1.14 PA should neither emit nor contain in their combustion products any harmful substances in hazardous concentrations.

6.1.15 PA of classes I-IV are to ensure safety (not blast in bulk) when falling in manufacturer's package onto a concrete base/steel plate from 12 m high and retain their consumer properties and safety after accidentally falling down in their consumer package or without the same to a rigid base from at least 1.5 m high at the ultimate temperatures specified for the PA.

Where technically reasonable, the normative and technical documentation for PA may set different values of the parameters of safety and stability to accidental falling with such values stated expressly in the PA-specific operating documentation.

(Revised edition, [Rev. 1](#)).

6.1.16 The number of failures for household PA should be no more than 10%. Specific values of the reliability parameters should be stated in the normative and technical documentation for the PA.

6.1.17 The marking on PA, consumer package and shipping containers should allow for identifying the PA. For PA of classes IV and V it is mandatory to specify the manufacturer, date of manufacture, and lot number.

6.1.18 Special requirements for PA designed for collective games and promotion of engineering creativity (marker, signal, target-marking grenades, rockets, mines, micromotors, initiating and propellant devices):

- their hazard class shall not be higher than class IV;

- they shall have operating documentation containing special information, including the list of necessary protective means for consumers, characteristics of directivity and range of flight, restrictions by the conditions of use (visual range, wind speed, recoil force, nature of the surface on which the articles should be used), and the warning that they are not to be used outside a specially equipped game field or without supervision by an instructor.

6.1.19 In the process of development of FA the following shall be taken into account:

6.1.19.1 Special requirements for FA:

- a) outer leads of FA IT should be provided with clearly visible safeguards against damage and accidental engagement;

- b) length of the wires (for FA with electrical igniter) or the fuse cord should be at least 150 mm longer than the permissible length of the mortar.

This requirement is not applicable to FA that are a ready-to-use one-time shot;

c) FA are to remain operable at the following conditions of use:

- at storage temperature between minus 50°C and plus 40°C;
- at temperature of use between minus 30°C and plus 40°C;
- after exposure at relative humidity up to 98% at temperature 25±5°C for no more than 8 hours;
- after transportation in manufacturer's package by rail to any distance, by road on highways in enclosed vehicles to a distance of max 5000 km at a speed no higher than 60 km/h, on dirt roads to a distance of max 300 km at a speed no higher than 40 km/h;
- after transportation by air in sealed cabs with no limitation on distance or altitude. Number of "takeoff-landing" cycles: five;

d) FA with IT as a fuse cord should ensure the time of delay from the moment of ignition of its tip to the triggering of the PC no less than 3 s, and the end of the fuse cord should be closed with a protective cap.

The IT of FA with calibers 150 mm and above should have initiating devices as an electrical igniter, the bare ends of the wires should be twisted and electrically insulated.

e) the recommended shelf life of FA is 3 years. The shelf life established for a specific FA should be indicated on the FA (the FA's package).

6.1.19.2 The test FA intended for the qualification of launch equipment should ensure displaying the interaction of the simulated article and its combustion products with the launch equipment at minimum possible sizes of the danger zone (minimum dispersion range of the ejected elements and their side effects).

The test FA should create in the tested LE a pressure exceeding the permissible level for the simulated FA type by at least 20% but by no more than 40%.

The operating documentation for the test FA should additionally contain data on the simulated FA types and extra safety measures for testing.

The test FA should have the certification of conformance.

6.1.19.3 Operational documentation for FA should contain the following additional special information:

- a) value of the maximum pressure created in the mortar in normal and abnormal (maroon) mode (other force impacts on the launch equipment) in the conditions of the recommended mortars;
- b) description of the effects produced;
- c) burst height/raise height;
- d) PE possible after-firing height;
- e) danger zone radius depending on the wind speed;
- f) DT (for articles with a fuse cord);
- g) recommended dimensions (diameter, length of the working section) of the mortar.

6.1.18, 6.1.19, 6.1.19.1-6.1.19.3. (Added, [Rev. 1](#)).

6.2 Requirements for normative and technical documentation for pyrotechnic goods

6.2.1 A set of documents is to be developed for PG, which should conform to the developer's norms and this standard.

(Revised edition, [Rev. 1](#)).

6.2.2 (Excluded, [Rev. 1](#)).

6.2.3 The normative documents for PA should contain approvals and endorsements (if required), intended use, name and identification of the article/its design options, and OKP (Russian national product classification code) in accordance with appendix C.

6.2.4 The "Technical requirements" section of a normative document (specification or standard) should comprise:

- PA's main parameters and dimensions;
- quality values and characteristics that determine the PA's consumer properties and safety;
- conditions of production, storage and use of the PA that would ensure the specified customer properties and safety of the PA throughout its shelf life;
- shelf life;
- delivery set;
- packing and marking requirements;
- safety requirements if the PA in the manufacturer's package is dropped from 12 m high and retainment of consumer properties and safety if the PA in the consumer package or without the same is dropped from at least 1.5 m.

6.2.5 The normative documents (specifications and standards) should contain the "Safety requirements" section, including:

- list of acting hazards;
- danger zone radius;
- transportation hazard class, compatibility group, emergency card number for responding in emergencies;
- methods of safe handling, use and disposal of faulty PA;
- transportation requirements and safety conditions (including fire safety), age limits and/or other restrictions for the user;
- measures to ensure safety in the danger zone (if required);
- text of the instruction for use;
- the conclusion: "The article is safe if used in conformity with this normative document (specification or standard) and the instruction for use."

6.2.6 The "Acceptance rules" section of the normative document (specification or standard) should envisage the complete nomenclature of parameters/characteristics to be determined during acceptance tests (AT), control methods and scope of the tests needed to confirm the consumer properties and safety of the PA.

The designer/manufacturer may guarantee conformance of PA with technical requirements that cannot be checked during the AT only if references are provided to documented data (statements, certificates, test reports, etc.).

6.2.7 The text of the operating documentation (instruction for use) of PA along with markings on the package/shipping container should contain:

- a) name/description of the product;
- b) warning that the product is dangerous;
- c) name and location of the product's manufacturer or importer (for imported goods);
- d) designation of standards or other documents (contracts) in accordance with which the PG have been

manufactured or supplied;

- e) best before date;
- f) list of hazards and danger zone sizes;
- g) restrictions to the conditions of use;
- h) requirements for safe storage and disposal of the product;
- i) information on certification of conformance of the PG with the technical regulations.

The cargo hazard class and the name of the manufacturer/exporter or importer, and also the lot details should be indicated on the shipping container.

The above information should be in Russian. Additional use of foreign languages is allowed provided that their contents are fully identical to the Russian wording.

The text of the markings should be clear and easily legible. Warning captions should be highlighted with a contrast font or accompanied with the "Attention!" legend.

6.2.3-6.2.7 (Revised edition, [Rev. 1](#)).

6.3 Safety requirements for handling pyrotechnic goods

6.3.1 PG should be transported, stored, used and disposed of (destroyed) in strict conformity with the normative documentation (instruction for use) of the PG, with general rules of safety and security in storage properly met.

The PA storage rules are given in appendix D to this standard.

6.3.2 Disassembling and retrofitting (rearming) of PA other than allowed by the normative and technical documentation for the PA by the consumer/seller, as well as misuse or using in other conditions than specified by the PG operating documentation, are not allowed.

6.3.3 A PG lot (or a part thereof) shipped to consumer (received by consumer or seller) should be provided with:

- shipping documents set out as appropriate;
- datasheet/form certifying conformance of PG with the PA documentation (for classes IV-V, except for PA for entertainment and FA);
- copy certificate/declaration of conformity with the safety requirements attested with a signature/facsimile of an officer and a seal/facsimile seal of the holder of the certificate/declaration of conformity.

6.3.1-6.3.3 (Revised edition, [Rev. 1](#)).

6.3.4 Application of FA for their intended purpose should be made with the use of LE meeting the requirements in appendix E.

6.3.5 Selling or using any PA with missing or lost identification signs, past their shelf life, with traces of damage, or without reading the instruction for use, are not allowed.

The main identification signs of PA include the name or code, designation of specification, item number or catalog number, manufacturer's symbol, lot number, and best before date. If the instruction for use is made as a separate document, it should contain the identification signs of the product. If the identification signs are placed on the consumer package, then selling or storing at the customer's outside of the package are not allowed.

6.3.4, 6.3.5 (Added, [Rev. 1](#)).

6.4 Safety requirements for imported pyrotechnic goods

6.4.1 Imported PG are to conform with the safety requirements specified in 6.1.2-6.1.19.3, 6.2.7, 6.3.1-6.3.5 of this standard.

6.4.2 Conformity of PG with the safety requirements shall be established for each lot of PA imported to the Russian Federation. A PG lot is understood as all of the products imported under a single contract.

6.4.1, 6.4.2 (Revised edition, [Rev. 1](#)).

6.4.3 The marking on PA, consumer package and shipping containers should allow for identifying the PA.

6.4.4 Information on the PA shelf life should be placed on the PA and/or its package.

6.4.5 Any PG lot presented for certification should be accompanied with:

- copy contract with the supplier;
- copy certificate of quality of the PG manufacturer;
- copy certificate of conformity (if available) issued by a competent authority of the manufacturer/supplier country;
- drawing/diagram explaining the principle of action and design of the PA;
- instruction for use;
- data on the compounds and their weights applied in the PA.

The documents are to be provided in Russian and attested with the applicant's signature and seal.

(Revised edition, [Rev. 1](#)).

7 Procedure for checking and confirming the safety compliance of pyrotechnic goods

7.1 The values of hazard parameters and danger zone sizes are to be determined as per [GOST R 51271](#).

If a PA has a specific hazard the measurement of parameters of which is not covered by the said standard, then the test methods specified by the normative documentation of such PA should be applied. The methods and procedures of testing shall be set out as appropriate.

7.2 In confirmation of the safety requirements, conclusions of competent expert and scientific organizations on conformity of PA with certain safety requirements may be recognized.

7.3 Conformity confirmation activities should be conducted in accordance with the normative documents adopted in due manner.

7.2, 7.3. (Revised edition, [Rev. 1](#)).

Appendix A
 (mandatory)

Classes and subclasses of hazardous cargos containing pyrotechnic compounds and pyrotechnic articles

Table A.1

Class	Sub-class	Description	Classification features
1.	1.1	PG with bulk explosion danger	PTC and PA characterized with bulk explosion danger
	1.2	PG not exploding in bulk	PTC and PA that are characterized with projection hazard but pose no bulk explosion danger
	1.3	Fire-hazardous PG not exploding in bulk	PTC and PG that are characterized with fire hazard and minor explosion hazard or minor projection hazard, or both, but not characterized with bulk explosion danger
	1.4	PG posing no significant danger	PTC and PA posing only minor explosion hazard in case of ignition or initiation in transportation The effects are manifested mainly inside the package, expecting no ejection of fragments of considerable size or to considerable distance. External fire should not be the cause of virtually instantaneous explosion of nearly all of the contents of the package
4	4.1	Inflammable solids	PTC and PG able to ignite from a short (up to 30 s) impact of a low-energy ignition source, and those igniting by friction
<p>Notes</p> <p>1 Explosion in bulk means an explosion that propagates to the whole cargo virtually instantaneously.</p> <p>2 Pyrotechnic articles for household use are regarded as hazardous cargo having classification codes 1.4G, 1.4S, 1.4F and 4.1, and those for technical application, having classification codes 1.1G-1.4G and 4.1.</p>			

Appendix A (Added, [Rev. 1](#)).

Appendix B
(mandatory)

Fireproofing sign

$$b = 2a$$



Figure B.1

Appendix B (Added, [Rev. 1](#)).

Appendix C
 (mandatory)

Pyrotechnic goods classification list

Table C.1

Classes of pyrotechnic goods by application	OKP code
1. Pyrotechnic goods for entertainment, including:	
1.1 - pyrotechnic toys (PA for household use of class I)	963980
1.2 - PA for household use of classes II-III	7275999100
1.3 - PA for technical use of class IV	727540, 727590
2 Thermite pyrotechnic means, fuse cords and quick matches, including:	727510
2.1 - thermite means	727511
2.2 - fuse cords and quick matches	727513, 727514
2.3 - pyrotechnic matches	727512
3 Lighting and photo-lighting pyrotechnic means	727520
4 Signal pyrotechnic means, including:	727530
4.1 - general purpose signals	727534
4.2 - training signal cartridges	727533
4.3 - signal rockets	727535
4.4 - signaling devices and distress signals of the marine register	7275381000
4.5 - signaling devices and distress signals of the river register	7275382000
4.6 - signaling devices and distress signals for small vessels	7275384000
4.7 - security means	7275385000
5 Firework pyrotechnic means/articles, including:	727540
5.1 - high altitude	7275440000
5.2 - for parks	7275450000
5.3 - testing	7275460000
5.4 - theatrical (special) pyrotechnic articles	7275470000
6 Smoke pyrotechnic means, including:	727550
6.1 - for household use	7275580000
6.2 - smoke candles	727551
6.3 - smoke generators	727552
6.4 - other	727559
7 Pyrotechnic means for pyroautomatics, interference and negotiating obstacles, including:	727560

7.1 - pyrotechnic power sources and sensors	7275681000
7.2 - delay elements	7275682000
7.3 - cutters	727565
7.4 - cartridges for expulsion of liquid	727561
7.5 - means of interferences (IR, radar, and sonar)	727562, 727563, 727566
7.6 - means for negotiation of obstacles	7275690000
7.7 - pyroheaters	727564
7.8 - other	7275699000
8 Pyrotechnic means for industrial use, including:	727570
8.1 - gas-generating and impacts on production wells	727571
8.2 - welding, cutting, building-up	727572
8.3 - means for destruction/disposal of various materials	727573
8.4 - firefighting means	727574
8.5 - delivery means (lifeline guns)	727575
8.6 - other	727579
9 Pyrotechnic means of environmental impact, including:	727580
9.1 - frost protection of plants	727581
9.2 - means of active influence on atmospheric phenomena	727582
9.3 - antihail rockets	727583
9.4 - other	727589
10 Simulation pyrotechnic means, training simulation munitions and others, including:	727590
10.1 - simulation munitions (cartridges, candles, firecrackers)	727591, 727592, 727593
10.2 - simulation articles, smoke apparatuses	727594
10.3 - means for group games	727595
10.4 - means for technical creativity	727596
10.5 - simulation pyrotechnic articles used in motion pictures and videos	7275980000
11 Solid-fuel pyrotechnic charges, including:	728400
11.1 - for industrial engines	728470
11.2 - pyrotechnic igniters of solid-fuel charges	728490
12 Pyrotechnic initiation means, including:	728700
12.1 - mechanical action/engagement	728710
12.2 - electrical triggering	728720

12.3 - temperature triggering	728740
13 Touristic goods, including means for heating and warming-up, disinfection and insect control, etc.	961971
14 Solid rocket fuels and pyrotechnic compounds, including:	727800
14.1 - solid pyrotechnic rocket fuels	727830
14.2 - pyrotechnic compounds	7278500000
15 Pyrotechnic instruments and apparatuses for automatic firefighting and fire alarm systems	437191

Appendix C (Added, [Rev. 1](#)).

Appendix D
 (mandatory)

Rules of storage of pyrotechnic articles

1 When designing, constructing and using warehouses/premises for PA storage, it is necessary to follow [Federal Law No. 123 dated July 22, 2008 "Technical regulation on fire safety requirements"](#), [Resolution by the Government of the Russian Federation No. 1082 dated December 24, 2009 "On adoption of the technical regulation on the safety of pyrotechnic compounds and articles containing them"](#), applicable national standards (GOST), building code (SNiP), industry-specific norms of engineering design and other normative and technical documents in the area of occupational, fire and environmental safety and health to the extent consistent with this standard.

2 PA are to be stored in equipped and duly permitted warehouse buildings/premises and should ensure safety, security, accountability and verifiability of the products in stock.

PA storages are subdivided into wholesale, active, and retail warehouses.

Table D.1 - Storage of PA depending on their hazard class

Hazard class	Storage area		
	Retail storage	Active storage	Wholesale warehouse
I-III	Allowed	Allowed	Allowed
IV	Not allowed	Allowed	Allowed
V	Not allowed	Allowed	Allowed
Va	Not allowed	Allowed in specialized organizations	Allowed in specialized organizations

3 In wholesale and active warehouses, only the works of acceptance, storage, and release of PA may be made. PA are to be stored in the supplier's package in conformity with the marking and handling signs and captions. Opening of the packages should be made in separate premises.

4 Safety of PA storage is to be ensured by complying with the requirements to packing, loading limits, duration of storage, conditions of storage (temperature, humidity), compatibility of products in stock, and by providing personal and collective protective equipment, taking measures for prevention of emergencies and elimination of their consequences.

5 Load limits and instructions for safe storage of PA and working in warehouses approved by the enterprise chief executive are to be displayed in an easily visible place in every warehouse.

6 The load limits for warehouse premises are to be installed considering the protective properties of structures, characteristics of compounds and articles in stock, distances from the storage place to other buildings, facilities, utility lines and crowded areas, and are to be approved by the EMERCOM State Firefighting Service authorities.

The load limits in warehouse premises/buildings of category B1 should not exceed 300 kg of PA per 1m², and for categories B2 to B4 it should be calculated by the fire load per unit area specified for that category of premises/buildings.

7 Warehouse buildings are to meet the applicable fire safety requirements and to be provided with the necessary firefighting means.

8 The warehouses are to have at least two emergency exits. It is allowed for warehouses up to 12 m long to make one emergency exit. However, the distance from any point of the floor to the exit should not exceed 30 m.

9 Warehouse doors shall be outward-opening.

Emergency doors shall be opening along the escape route.

10 The warehouse building is to have explosion surfaces (ES). An ES design area shall include:

- open gaps and holes;
- relief structures;
- windows;
- doors.

It is recommended to determine the minimum ES area as:

$$F = 2 \cdot 10^{-3} \cdot P_{\text{II}},$$

where F is total area of explosion surfaces, m²;

P_{II} is load limit of premises by compounds and gunpowders in the articles, kg.

11 All wholesale and active PA warehouses shall have lightning protection.

12 The arrangement of lighting and electrical equipment of warehouses shall meet the requirements of the applicable normative and technical documentation on the arrangement of electrical installations.

13 Warehouse buildings and premises are to be equipped with fire security alarms.

The power supply system of the fire alarm shall have a redundant power supply cutting in automatically in case of the main electrical network outage.

14 The ventilation system shall preclude the propagation of fire by air ducts from one room to another.

15 PA packages should be stored in piles or on racks. The placement of articles in piles and on racks should provide access for ventilation, inspection and withdrawal of packages from every pile or rack.

A plate shall be attached onto every pile and rack stating the PA name/item number and lot number.

When piling the PA, leave aisles along the walls at least 0.8 m wide, a longitudinal aisle at least 1.5 m wide, and lateral aisles every 6 m along the warehouse length at least 0.8 m wide.

The piling method should preclude piles from breaking down and damaging the packages of the products in the pile.

Warehouse premises opposite the doors are to have free aisles with the width equal to that of the doors.

16 Transport devices used for mechanization of warehouse and handling operations (carts, etc.) are to be certified in the manner established at the enterprise.

17 The security management of wholesale warehouses and their technical resistance against burglary shall ensure security of PA.

18 Workers engages in organizing and carrying out the PA storage process are to have the necessary qualification and be allowed for work in accordance with the applicable regulatory documents in the respective enterprise.

19 Disposal of PA lots is to be made by specialized organizations authorized for this kind of activity. Where so provided for by the article-specific regulatory documentation, disposal of single PA may be conducted at the consumer's in accordance with the instruction for use.

Appendix D (Added, [Rev. 1](#)).

Appendix E
(mandatory)

Launch equipment requirements

1 LE is to meet the requirements of this standard and the design documentation set (for LE of the Russian origin) approved in due manner. The recommended depth to inner diameter ratio of the mortar is between 4 and 6.

2 The design and the mechanical properties of LE, guides, frames and other PA holding devices should compensate the forces and moments acting on them at any rate and sequence of engagement of the PA armed in them as per the normative documentation, and the impacts exerted by them on the PA should not lead to accidental triggering or abnormality.

3 LE is to be operable and safe in use under the influence of:

- ambient temperature between minus 30°C and plus 40°C;
- after exposure at relative humidity up to 98% at temperature 25±5°C for at least 8 hours;
- after transportation at ambient temperature between minus 50°C and plus 50°C unpacked: by rail in a covered wagon with no limitation of distance or speed; by road in a covered motor vehicle on asphalted or concrete highway to a distance of at least 5000 km with speed no higher than 60 km/h, and on dirt roads to a distance of at least 500 km with speed no higher than 40 km/h;
- after transportation by air in unsealed cabs with no limitation on distance or altitude. Number of "takeoff-landing" cycle is unlimited;
- after storage unpacked in unheated storages with natural temperature fluctuations between minus 50°C and plus 50°C for at least three years.

Stricter limitations may be introduced for certain kinds of LE, which shall then be indicated in their operating documentation.

4 PE and guides are to ensure a shooting direction setting accuracy of ±5° or better.

5 The normative and technical documentation for PA of Russian origin shall contain requirements to the level of working and permissible pressure/strength, geometry, operation resource, controllable parameters and inspection methods, and storage and use conditions. The operating documentation for LE shall contain information on its mechanical strength (permissible pressure inside the mortar, mechanical loads), geometry, types of articles permitted for the armament, necessary safety measures, and other limitations (if required) for use.

6 LE and separately manufactures mortars shall have a document/logbook of a standard form with a mandatory (for products of Russian origin) mark of the manufacturer on conformity with the normative and technical documentation for that product and filled-in sections (except for single-use articles) for the counting of the number of shots per barrel, repairs and refurbishment works, and results of periodic and extraordinary checks of strength and geometry (qualifications).

7 LE may be qualified using special testing items intended for the checking of the respective LE type, as well as by direct loading. Hydrostatic pressurization of the mortar in its bottom part should be made for at least 30% of the total depth of the mortar.

8 Communication lines and RCD shall be protected from unauthorized triggering of PA (including static electric charges and induced currents) and have reliable electric insulation.

9 Mortars shall have marking applied on a fixed visible part, which must include the mortar's type identification, manufacturer, production date, and identification number.

If inserts and spacers are available in the set, they shall be marked with the mortar diameter and the insert inner diameter (105/100 insert) and the spacer height. In all cases the instructions for use of the LA (supplements to them) shall contain the list and method of installation of inserts and spacers (including disposable ones) into mortars and check-out operations.

10 Mortars are to ensure unobstructed movement of the FA armed in them and may be completed with spacers to adjust the working part depth.

Using mortars with the actual inner diameter over the mortar's whole length exceeding the actual diameter of the FA to be armed by more than 2 mm is not allowed, except for FA with IT leads made as electrical wires with maximum insulation diameter up to 0.8 mm, for which the mortar diameter shall be no more than 1 mm greater.

11 Consistency of the mortar's geometry with the FA's operating documentation may be achieved by using inserts and spacers.

12 Fiberglass mortars are allowed for use for no more than three years after manufacturing, provided that they are re-qualified each year after the winter season. Fiberglass mortars over 150 mm in caliber are not permitted for launching FA.

13 Reuse of paper-rolled mortars over 64 mm in caliber is not allowed.

Appendix E (Added, [Rev. 1](#)).

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L75

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