

2018 APA STANDARD 87-1A

STANDARD FOR THE CONSTRUCTION, CLASSIFICATION, APPROVAL, AND TRANSPORTATION OF CONSUMER FIREWORKS

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NOTE: The latest version of Appendix I, II, III and V are available on the PHMSA website at PHMSA.DOT.GOV

PART 1: Introduction and Applicability

1.1 Introduction

This document describes requirements related to Novelties and Consumer Fireworks classed as UN0336, Fireworks, Division 1.4G only and is not intended to supersede the transportation requirements in accordance with Title 49 Code of Federal Regulations (CFR) Parts 100-185.

The American Pyrotechnic Association (APA) is a primary national industry association for manufacturers, importers, wholesalers, distributors, and retailers of consumer fireworks, display fireworks, and entertainment industry and technical pyrotechnic devices. The U.S. Department of Transportation (DOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) has jurisdiction over the packaging and transportation of hazardous materials in commerce, pursuant to Title 49 CFR, Parts 100-185. The U.S. Consumer Product Safety Commission (CPSC) has jurisdiction in the United States over devices intended for use by consumers. The regulations for consumer fireworks are found in Title 16, CFR.

This document is subject to review and every effort is made to keep the standard consistent with Federal regulations. The APA will periodically review and amend this standard every five years or more frequently as appropriate. Proposed changes to this standard may be submitted to the APA in writing. Submitters should provide the proposed language, substantiation, and request that the change be considered for incorporation by reference. Users are cautioned to obtain the latest edition of this document and all applicable regulations before making any decisions based on the material noted in this standard.

This document should not be confused with Federal, state or municipal specifications or regulations, insurance requirements, or national safety codes. However, when incorporated by reference (IBR) in Title 49 CFR, those portions of this document that apply to the manufacturing and transportation of consumer fireworks have the force of a Federal regulation, and the manufacturers, importers, wholesalers, distributors, retailers and shippers of consumer fireworks are subject to penalties pertaining thereto.

This document describes a standard in which classifications are assigned based on the weight and type of chemical composition contained in each specific device. When a specific Approval is sought for a device that does not comply with the requirements of this standard, this standard may not be used and the Approval procedures specified in 49 CFR § 173.56(b) or (f) must be followed.

Pursuant to the procedure described in 5 U.S.C. 552(a) and 1 CFR Part 51, Parts 1 through 5 of this document have been incorporated by reference into 49 CFR § 171.7. The Appendices to this document are not incorporated by reference and are provided solely as guidance materials. Unless otherwise noted, all CFR references cited in this standard refer to sections in effect on October 1, 2017.

Requests for classification approvals under the procedures described in this document can be sent to the U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration, Office of Hazardous Materials Safety, Approvals & Permits Division, East Building, 1200 New Jersey Avenue, SE, Washington, DC 20590-0001 or by using the e-mail address: fireworks@dot.gov or submitted on line through the PHMSA website.

Requests for certifications under the procedures described in this document can be sent to one of the DOT approved Fireworks Certification Agencies (FCA). The list of approved FCAs may be found on the PHMSA website.

The information contained in this document was obtained from sources believed to be reliable and is based on technical information and experience currently available from members of the APA and others. However, the Association, and its members, make no guarantee of the results and assume no liability or responsibility in connection with the information or suggestions contained within, or that abnormal or unusual circumstance may not warrant or suggest further requirements or additional procedures.

1.2 Applicability

This document applies to fireworks meeting the requirements of consumer fireworks and novelties. Pursuant to the procedure described in 5 U.S.C. 552(a) and 1 CFR Part 51, Parts 1 through 5 of this document has been incorporated by reference into 49 CFR § 171.7. Specifically, this document details the requirements for obtaining approvals for the transportation of Consumer Fireworks classed as UN0336, Fireworks, Division 1.4G and Novelties not regulated as Class 1. The Appendices to this document are not incorporated by reference and are provided solely as guidance materials.

PART 2: Consumer Fireworks – Definitions and General Requirements

2.1 Introduction

This standard is limited in scope to the classification requirements for transportation of consumer firework devices or novelties.

This standard provides consumer firework and novelty manufacturers with requirements and information on how to submit an application request for classification of a 1.4G Fireworks. Under 49 CFR §§ 173.64 and 173.65, fireworks are permitted to be approved by PHMSA or certified by an FCA for transportation, if the firework device is compliant with the APA Standard 87-1A incorporated by reference.

2.2 Classification

2.2.1 Novelty devices, which comply with Section 3.2.1 of this standard, are not subject to review by PHMSA or an FCA. An EX approval (EX number) or FC certification letter (FC number) is not required to ship the novelty devices, specifically listed in the APA Standard 87-1A, into or within the United States. However, when novelties are transported by air, they must be classed as UN3178, Flammable Solid, inorganic, n.o.s. (Novelties), 4.1, PGII.

2.2.2 Only consumer fireworks which comply with this standard may be approved by PHMSA or certified by an FCA. For devices not listed in this standard see 49 CFR § 173.56.

2.3 Definitions of Some Common Consumer Firework Terms

Term	Definition
Aerial Device	A device designed to produce its effect(s) in the air
Applicant	The manufacturer of the consumer firework or novelty device
Approval (also known as a competent authority approval)	Written authorization from the Associate Administrator of the Office of Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration, of the U.S. DOT or other designated Department official, to perform a function that requires prior authorization under subchapter C of 49 CFR Parts 100-185
Assembled Devices	A display piece made (assembled together) from other devices with valid approval and/or certification transported by private carriage
Assortment Pack	Multiple finished items combined for retail sale
Attachments	Attachments are external components of an aerial device
Base	The bottom surface or an attachment that is affixed to the bottom of a device, which provides stability to maintain the device in a vertical position upon functioning
Black Match, Fuse	Uncovered fuse made from thread impregnated with black powder
Black Powder	A chemical composition used in firework devices

Term	Definition
Break/Burst Charge	A chemical composition used to open an aerial device
Cake	A multiple tube device that is fused and assembled together to form one device
Certification	Document issued by a Firework Certification Agency indicating that the 1.4G UN0336 fireworks application complies with all the requirements of this standard
Chemical Composition	Chemical formulations contained in a firework or novelty device
Combination Device	Multiple devices that are fused and assembled together to form one device
Consumer Fireworks	A finished firework device, including a reloadable kit, that requires no assembly and is in a form intended for use by the public that complies with the limits and requirements of this standard, and the construction, performance, chemical composition, and labeling requirements codified by the CPSC in <i>Title 16 CFR</i>
Driver	A firework component (tube) that contains a propellant charge
Effect	A chemical composition, other than lift charge or burst charge, which upon functioning will burn or explode to produce a visual and/or audible result
Electric Igniter (E-Match)	A device used for the electrical ignition of pyrotechnic devices
EX Number	An explosive classification approval number preceded by the prefix "EX", assigned by the Associate Administrator of PHMSA, to a device that has been reviewed and classed under the provisions of 49 CFR §§ 173.56 or 173.64
Explosive Composition	Any chemical composition whose primary purpose is to produce a report (audible effect) in a consumer firework device
Firecracker	A small, paper-wrapped or cardboard tube containing explosive composition.
Firework Certification Number (FC #)	A firework certification number preceded by the prefix "FC", assigned by a Fireworks Certification Agency, to a consumer fireworks device that has been reviewed and certified to meet 1.4G requirements for transportation under the provisions of 49 CFR § 173.65
Firework Device	A device containing chemical compositions, which upon functioning produces a desired effect that is intended for public or professional use
Fireworks Certification Agency (FCA)	An entity authorized under the provision of 49 CFR § 107.402 to review and certify Division 1.4G UN0336 consumer fireworks device as being in compliance with this standard
Flash Powder	A term for a chemical composition used to produce a report
Fountain Powder	The chemical composition used to expel the effects from a fountain only
Fuse	A core of fine grained powder surrounded by a flexible material
Fuse, Connecting	A fuse used to connect tubes and/or components in a device
Fuse, Ignition	A fuse used to initiate the functioning of a consumer firework or novelty device

Term	Definition
Fuse, Quickmatch instantaneous, non-detonating	A piece of black match that is encased in a paper and/or plastic sheath designed to burn fast
Ground Device	A device that is designed to produce its effects at or near ground level
Handle	A part of the device intended to be held in the hand while the device functions
Ignition Powder	A chemical composition used to ensure ignition transfer between components in a device
Inserts	An internal component of a device that can contain a burst charge
Lift or Lifting Charge	A chemical composition intended to expel internal components from a device
Manufacturer of Fireworks	An entity that produces the finished firework device
Novelty Device	A device that meets the General Requirements in Section 2.4 and the Specific Requirements in Section 3.2.1
Particle Size	A measurement, expressed in microns, of a chemical component (typically used for metal powders)
Propellant Charge	A chemical composition that burns at a controlled rate to produce thrust, which causes movement of a device
Pyrotechnic composition	A chemical mixture, which upon burning, and without explosion, produces a visual display, whistle, and/or motion.
Report	A concussive effect and flash of light produced by the ignition of a chemical composition
Safety fuse	<ol style="list-style-type: none">1. A fuse commonly used as the ignition fuse in consumer fireworks, consisting of a thread-wrapped black powder train that has protection against side ignition2. Safety fuse is not Fuse, Safety UN0105
Spike	A part of the device used to keep the device upright and secure in the ground while it functions
Tail	A chemical composition that burns during the flight of an aerial device to produce a visual effect

2.4 General Requirements

These requirements, where applicable, must be met for all consumer firework devices and novelties constructed under this standard.

General Requirements for Consumer Fireworks and Novelties	
Aerial device	Must be designed to produce its effect(s) in the air
Applicant	Must be the manufacturer. In addition, foreign applicants must have a U.S. Designated Agent who may submit an application to PHMSA on their behalf (See 49 CFR § 105.40)
Assembled Device	Must comply with requirements in Part 5
Base	Must remain attached during transportation and handling
Black Match	Must be made with black powder
Black Powder	Must consist of a mixture of charcoal or carbon and either potassium or sodium nitrate, potassium perchlorate, with or without sulfur and may contain a binder
Break/Burst Charge	<ol style="list-style-type: none"> 1. Must not exceed 25 percent of the total chemical composition weight per tube including the lift charge 2. Any burst charge containing metallic powder (such as magnalium or aluminum) less than 149 microns (100 mesh) in particle size is limited to 130 milligrams 3. Secondary burst charges are only permitted in inserts
Cake (200 and 500)	<p>Must be a multiple tube device:</p> <ol style="list-style-type: none"> 1. Must contain items marked “yes” on line 81 of the requirement tables, 2. Must comply with the individual device requirement tables for specific weight limits, chemical restrictions and special conditions, and 3. Must be fused and assembled together to form one device. (Sequential fusing required) <p><u>200 gram cakes:</u></p> <ol style="list-style-type: none"> a. Require no separation between tubes; b. The total combined weight of the chemical compositions in all tubes must not exceed 200 grams; and c. The tubes must be securely held together by glue, wire, string or other means. <p><u>500 gram cakes:</u></p> <ol style="list-style-type: none"> a. If the inner diameter of any tube is greater than 12.7 millimeters (0.5 inches), tubes must be separated from each other by a minimum distance of 12.7 millimeter at the top, bottom and sides b. If the inner diameter of all tubes is less than 12.7 millimeters and contains less than 5 grams of composition no tube separation is required c. The total combined weight of the chemical compositions in all tubes is greater than 200 grams and must not exceed 500 grams; and d. The device must have an attached base.
Chemical Composition	Must be the formulation(s) used to produce the pyrotechnic effects that are listed on the application request and must be formulated from the chemicals in the Permitted and Restricted Chemical Table for Consumer Fireworks and Novelties (available on the PHMSA website)
Chemical Restrictions	Must be adhered to when using restricted chemicals in any chemical composition (available on the PHMSA website)

General Requirements for Consumer Fireworks and Novelties	
Combination	<p>Must contain more than one device fused together to form a new device (other than just tube devices):</p> <ol style="list-style-type: none"> 1. Must contain items marked “yes” on line 82 of the requirement tables, 2. Must comply with the individual device requirement tables for specific weight limits, chemical restrictions and special conditions, 3. Must be fused and assembled together to form one device. (Sequential fusing required), 4. Must have an attached base if marked “yes” on line 51 of the requirement tables, 5. Spikes are permitted. <p><u>200 gram combination:</u></p> <ol style="list-style-type: none"> a. require no separation between devices; and b. the total combined weight of the chemical composition in all devices must not exceed 200 grams. <p><u>500 gram combination:</u></p> <ol style="list-style-type: none"> a. For tube devices, if the inner diameter of any tube is greater than 12.7 millimeters (0.5 inches), tubes must be separated from each other by a minimum distance of 12.7 millimeter at the top, bottom and sides b. If the inner diameter of all tube devices is less than 12.7 millimeters and contains less than 5 grams of composition no tube separation is required c. The total combined weight of the chemical compositions in all tubes is greater than 200 grams and must not exceed 500 grams; and d. The device must have an attached base.
Construction	<ol style="list-style-type: none"> 1. Materials must be suitable for the intended purpose and the integrity of the device must be maintained during transportation and handling; and 2. Product must not leak pyrotechnic composition during transportation and handling
Dimensional Series	Only devices that are marked “yes” on line 83 of the requirements table are permitted to be approved as a series. See Series Application for additional requirements.
Driver	<ol style="list-style-type: none"> 1. Contains the propellant charge; 2. Must be constructed of sturdy materials such as (but not limited to) plastic, Kraft paper, or cardboard; and 3. Must be securely attached to the device so as not to separate or come loose during transportation
Effects	Must be formulated from the chemicals listed in the Permitted and Restricted Chemicals Table. Lift charge, burst charge, and fuses are not considered effects
Effect Series	Only devices that are marked “yes” on line 83 of the requirements table are permitted to be approved as a series. See Series Application for additional requirements.
Electric Igniter (E-Match)	Not permitted, excluding assembled devices defined in Part 5.
Fountain Powder	Must be black powder
Finished Consumer Firework	<p>A consumer firework device or reloadable kit that:</p> <ol style="list-style-type: none"> 1. Meets the General Requirements for that specific device; 2. Meets all the requirements in the requirement tables in Part 3; 3. Passes the Thermal Stability Test in Part 4; 4. Has no loose chemical composition in the packaging; 5. Requires no assembly; 6. Marked with the EX Number/ FC Number on the device, or packaging if the device is too small; and 7. Any device manufactured, prior to October 1, 2018 is not required to be marked with the EX Number/FC Number

General Requirements for Consumer Fireworks and Novelties	
Fuse	<p>Connecting, Delay, Ignition Fuse, Safety Fuse and Quickmatch are not required to be listed on the chemical composition sheet. If fuse is listed on the chemical composition sheet, formulations of nitrate and perchlorate salts mixed with or without charcoal, sulfur, benzoates, and binders are permitted</p> <p>Ignition fuse is a component of finished fireworks and is limited to one per device and must be safety fuse.</p> <p>Safety Fuse is fuse designed to resist side ignition and is used to ignite firework devices. For the purposes of this standard, safety fuse is not Fuse, Safety (UN0105).</p>
Ground Device	Must be designed to produce its effect(s) at or near the ground level
Handle	May be cardboard, paper tube, plastic, wire or wood
Insert	A cylindrical or spherical receptacle containing pyrotechnic and/or non-pyrotechnic effects
Launch Tube	<ol style="list-style-type: none"> Is a component of reloadable kits and must be constructed of sturdy materials such as (but not limited to) plastic, fiberglass, Kraft paper, or cardboard with an attached base. The tube must be capable of launching twice the number of devices contained in the kit without failure of the tube
Lift or Lifting Charge	Must be formulations of nitrate salts mixed with charcoal, sulfur and with or without a binder
Manufacturer of Consumer Fireworks and Novelties	Must be the entity that produces the finished device
Novelty Devices	<ol style="list-style-type: none"> Must meet the requirements of Section 3.2.1 of this standard and are not subject to review by PHMSA or an FCA EX approval or FC certification is not required to transport Novelty devices, listed in this standard, into or within the United States When novelties are transported by air, they must be classed as UN3178, Flammable Solid, inorganic, n.o.s. (Novelties) 4.1, PGII. Each outer package containing novelties must be plainly marked "NOVELTIES, NOT REGULATED, EXCEPT WHEN TRANSPORTED BY AIR, IN CONFORMANCE WITH APA STANDARD 87-1A"
Particle Size	Must be provided in microns, when aluminum, magnesium, and/or titanium are used in a chemical formulation. The smallest particle size is all that is required, but a range can be provided
Prohibited Components	No component of any consumer fireworks device or novelty, may upon functioning, project or disperse any metal, glass, or brittle plastic fragments
Propellant Charge	<ol style="list-style-type: none"> Formulations are not limited to black powder; Only permitted in aerial spinners, chasers, ground spinners, girandolas, helicopters, missiles, rockets, specialty items, and wheels; Metal powders must be greater than 149 microns in particle size and must not exceed 10 percent by weight of the propellant charge; and Benzoates, phthalates, salicylates and terephthalates are only permitted in a propellant charge that produces a whistle effect

General Requirements for Consumer Fireworks and Novelties	
Reloadable Kits:	<ol style="list-style-type: none"> 1. Must contain a fully assembled tube with attached base; 2. No more than 60 grams per reloadable shell; 3. No more than 12 reloadable shells per kit; 4. No more than 400 grams of chemical composition in a kit; 5. All launching tubes for mines and shells must be capable of firing twice the number of devices in the kit without failure of the tube; and 6. Each kit must be in an inner packaging
Reports	<ol style="list-style-type: none"> 1. Are permitted when line 21 is marked yes and are limited to 50 mg per report for ground devices and 130 mg per report for aerial devices. 2. Multiple reports are permitted when line 23 is marked yes
Rocket Stick	Must remain securely attached to the device while in transportation
Series Application	<p>A series is a group of closely related devices that are categorized as a dimensional series or an effect series and meet the following requirements:</p> <ol style="list-style-type: none"> 1. Series approvals are limited to one category of device; 2. Dimensional series: <ol style="list-style-type: none"> a. Must contain the same chemical composition; and b. Only vary in size, weight, and/or numbers of tubes in the device 3. Effect series: <ol style="list-style-type: none"> a. Must be the same size, maximum weight and numbers of tubes; and b. Only vary in the effects produced (chemical formulations vary)
Specialty Devices	Does not require sequential fusing
Shells (aerial)	<ol style="list-style-type: none"> 1. Single or stacked cylindrical or spherical receptacle constructed of sturdy materials such as (but not limited to) plastic, Kraft paper, or cardboard; and 2. Must be a component of an aerial firework device or reloadable kit
Smoke Compositions	Formulations that incorporate chlorates must contain an equal or greater amount of an acid neutralizer (bicarbonates or carbonates).
Tails	May be either an external or an internal component of an aerial shell or a mine device. External tails must remain securely attached to the device during handling and transportation
Thermal Stability test	Must be conducted in accordance with the requirements outlined in Part 4 of this standard or 49 CFR § 173.64(a)(2)
Tubes	Must be constructed of sturdy materials such as (but not limited to) plastic, fiberglass, Kraft paper, or cardboard

PART 3: Specific Requirements for Novelties and Consumer Fireworks

3.1 Introduction

In addition to the general requirements in section 2.4, this part contains the specific requirements for Novelties and for each type of consumer fireworks that can be approved or certified under this standard. The chemical composition weights listed in this standard are the maximum weight limits permitted for the components and the finished device. The requirements for novelties, ground devices, aerial devices, cakes, combinations, reloadable kits and fuse are provided in the following tables. When a requirement is not applicable, it was omitted from the requirements table. The units of measure for the following tables are grams for weights and millimeters for dimensions, abbreviations I.D. = inner diameter, O.D. = outer diameter. Devices in APA Standard 87-1A, are for consumer use.

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3.2.1 Novelties

3.2.1.1 - Booby Trap / Pull Apart

	Booby Trap – a device that is actuated by means of friction that when pulled apart, activates the device producing a noise effect.	
	Attribute	Requirements
1	Composition weight in finished device	0.016 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Only formulations of barium, potassium and/or sodium chlorate with red phosphorus are permitted.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	12

3.2.1 Novelties

3.2.1.2 - Novelty Flitter Sparkler

	Flitter Sparkler – a paper or cardboard tube attached to a stick or wire that produces a shower of sparks, a colored flame and/or a crackling effect.	
	Attribute	Requirements
1	Composition weight in finished device	5 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	Yes
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	Yes
63	Ignition fuse must be safety fuse	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Formulations containing chlorates are limited to 4 grams with no more than 15 percent of the formulation being chlorates.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	8

3.2.1 Novelties

3.2.1.3 - Party Popper

	Party Popper – a device that is actuated by means of friction. Pulling the string or trigger activates the device producing a noise effect and releasing paper streamers or confetti. Common examples resemble champagne bottles and toy pistols.	
	Attribute	Requirements
1	Composition weight in finished device	0.016 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Only formulations of barium, potassium and/or sodium chlorate with red phosphorus are permitted.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	72

3.2.1 Novelties

3.2.1.4 – Novelty Snake

	Snake – a device in the form of a pressed pellet of chemical composition that upon burning produces a snake-like ash that expands in length as the pellet burns.	
	Attribute	Requirements
1	Composition weight in finished device	2 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Only formulations of nitrated asphalt, asphaltum, bitumen, pitch and/or tar with an oxidizer (with or without a binder) are permitted.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	25

3.2.1 Novelties

3.2.1.5 - Snapper

	Snapper – a paper or plastic wrapped device that contains silver fulminate coated on small bits of sand or gravel. When dropped the device activates, producing a noise effect.	
	Attribute	Requirements
1	Composition weight in finished device	0.001 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Only formulations of silver fulminate are permitted.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Inner packages must contain sawdust or similar impact absorbing material.
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	50

3.2.1 Novelties

3.2.1.6 - Novelty Wire Sparkler or Novelty Dipped Stick

	Wire Sparkler or Dipped Stick – a device that consists of a metal wire or wood dowel coated with a chemical composition that produces a shower of sparks, a colored flame and/or a crackling effect.	
	Attribute	Requirements
1	Composition weight in finished device	25 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	Yes
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Formulations containing perchlorates are limited to 5 grams. Formulations containing chlorates are limited to 4 grams with no more than 15 percent of the formulations being chlorates.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	8

3.2.1 Novelties

3.2.1.7 - Novelty Smoke Device

Novelty Smoke – a device that produces only smoke.		
	Attribute	Requirements
1	Composition weight in finished device	5 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Formulations containing chlorates must contain an equal or greater amount of an acid neutralizer (bicarbonates or carbonates).
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Tubes are permitted
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	72

3.2.2 Ground Devices, Individual

3.2.2.1 - Chaser

	Chaser – a device consists of a paper or cardboard tube venting out the fuse end of the tube.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	20 grams
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.050 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.2 - Crackling Ball

	Crackling Ball - a device that consists of a spherical ball that contains small granules (micro-stars) of chemical composition that produce sparks and/or a crackling effect.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
103	Composition weight per inner packaging	72 grams

3.2.2 Ground Devices, Individual

3.2.2.3 - Crackling Strip

	Crackling Strip - a device that consists of small granules (micro-stars) of chemical composition adhered to and encased in a paper or cardboard wrapping that produce sparks and/or a crackling effect.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
103	Composition weight per inner packaging	72 grams

3.2.2 Ground Devices, Individual

3.2.2.4 - Crackling Tube

	Crackling Tube - a device that consists of a tube that contains small granules (micro-stars) of chemical composition that produce sparks and/or a crackling effect.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
103	Composition weight per inner packaging	72 grams

3.2.2 Ground Devices, Individual

3.2.2.5 - Firecracker

	Firecracker – a device that consists of a paper-wrapped or cardboard tube that produces a single report.	
	Attribute	Requirements
1	Composition weight in finished device	0.050 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.050 grams
23	Multiple reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	No
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Multiple firecrackers can be fused together to form a string. There is no limit to number of firecrackers in a string.
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.6 - Flasher / Strobe

	Flasher - a device containing a chemical composition that produces a crackling / flashing / strobing light effect.	
	Attribute	Requirements
1	Composition weight in finished device	5 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
103	Composition weight per inner packaging	60 grams

3.2.2 Ground Devices, Individual

3.2.2.7 - Flitter Sparkler

	Flitter Sparkler – a paper or cardboard tube attached to a stick or wire that produces a shower of sparks, a colored flame and/or a crackling effect.	
	Attribute	Requirements
1	Composition weight in finished device	25 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	Yes
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	Yes
63	Ignition fuse must be safety fuse	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Formulations containing chlorates are limited to 4 grams with not more than 15 percent of the formulations being chlorates.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.8 - Fountain, Cone

	Fountain, cone – a device that produces a shower of any combination of colored sparks, color flame, crackle, smoke, whistle and/or micro star effects.	
	Attribute	Requirements
1	Composition weight in finished device	50 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	Yes
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	Yes
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Pyrotechnic composition in a conical paper or cardboard container.
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.9 - Fountain, Cylindrical

	Fountain, Cylindrical - a device that produces a shower of any combination of colored sparks, color flame, crackle, smoke, whistle and/or micro star effects.	
	Attribute	Requirements
1	Composition weight in finished device	100 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	Yes
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	Yes
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.10 - Fountain, Nitrocellulose

	Fountain, Nitrocellulose – a device that produces a shower of sparks, color and/or flame as its primary effect using nitrocellulose as the major chemical component.	
	Attribute	Requirements
1	Composition weight in finished device	15 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	Yes
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	Yes
63	Ignition fuse must be safety fuse	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	When used in a multiple tube device (cake or combination) nitrocellulose is limited to 10 grams per tube and 100 grams per device.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	Yes
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	For a cone fountain a cone can be used in place of the tube requirement.
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.11 - Ground Spinner

	Ground Spinner - a device that contains chemical composition that emits a shower of colored sparks that vent out of an orifice causing the device to spin rapidly on the ground.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	20 grams
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.050 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Multiple ground spinners can be fused together to form a string, commonly referred to as "Jumping Jacks". Strings are limited to 20 grams of total composition.
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.12 - Illuminating Torch

Illuminating Torch - a device that emits a colored flame with or without crackles or sparks		
	Attribute	Requirements
1	Composition weight in finished device	100 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	Yes
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.13 - Smoke

Smoke – a device that produces smoke as the primary effect.		
	Attribute	Requirements
1	Composition weight in finished device	100 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Formulations containing chlorates must contain an equal or greater amount of an acid neutralizer (bicarbonates or carbonates).
80	Cake, Combinations and Series	--
81	Device permitted in a cake	Yes
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Multiple smoke devices can be fused together to form a string. Strings are limited to 100 grams of total composition.
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.1.14 – Snake

	Snake – a device in the form of a pressed pellet of chemical composition that upon ignition produces a snake-like ash that expands in length as the pellet burns.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	No
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Only formulations of nitrated asphalt, asphaltum, bitumen, pitch and/or tar with an oxidizer (with or without a binder) are permitted.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.15 - Specialty Device

	Specialty Device – a device in the shape of an animal or a small vehicle, etc. that produces multiple effects.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
3	Composition weight per tube	2 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	2 grams
13	Fountain powder permitted	Yes
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.050 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	Yes
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Tubes must not contain aerial components or internal shells. Sequential fusing is not required.
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.16 - Wheel

	Wheel – a multi-tube device intended to be attached to a support so it can rotate and produce a shower of sparks, whistle and/or other effects.	
	Attribute	Requirements
1	Composition weight in finished device	200 grams
3	Composition weight per tube	60 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	20 grams
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	Yes
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Handles are not permitted.
100	Packaging	--
101	Packaging limits	No

3.2.2 Ground Devices, Individual

3.2.2.17 – Wire Sparkler or Dipped Stick

	Wire Sparkler or Dipped Stick – a device that consists of a metal wire or wood dowel coated with a chemical composition that produces a shower of sparks, a colored flame and/or a crackling effect.	
	Attribute	Requirements
1	Composition weight in finished device	100 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	Yes
60	Ignition Requirements	--
61	Ignition fuse required	No
62	Ignition fuse permitted	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	Yes
72	Restriction	Formulations containing chlorates are limited to 4 grams with no more than 15 percent of the formulations being chlorates.
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	Yes
103	Composition weight per inner packaging	120 grams

3.2.3 Aerial Devices, Individual

3.2.3.1 - Aerial Spinner

	Aerial Spinner - a device that spins and rises into the air without a blade or propeller and may produce a secondary effect while in flight.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	20 grams
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	Yes
36	Multiple driver tubes permitted	Yes
40	Inserts and Shells	--
41	Inserts permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.3 Aerial Devices, Individual

3.2.3.2 - Girandola

	Girandola - a device that spins and rises into the air and may produce secondary effects while in flight.	
	Attribute	Requirements
1	Composition weight in finished device	200 grams
3	Composition weight per tube	60 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	20 grams
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	Yes
36	Multiple driver tubes permitted	Yes
40	Inserts and Shells	--
41	Inserts permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	A propeller or blade is permitted, but not required. A minimum of 3 drivers are required.
100	Packaging	--
101	Packaging limits	No

3.2.3 Aerial Devices, Individual

3.2.3.3 - Helicopter

	Helicopter - a device containing an attached propeller or blade that spins and rises into the air and may produce a secondary effect while in flight.	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	20 grams
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	Yes
36	Multiple driver tubes permitted	Yes
40	Inserts and Shells	--
41	Inserts permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.3 Aerial Devices, Individual

3.2.3.4 - Mine Preloaded

	Mine Preloaded – a device that ignites and projects its effect directly out of the launch tube. Effects may be pyrotechnic and/or non-pyrotechnic	
	Attribute	Requirements
1	Composition weight in finished device	60 grams
6	Lift charge permitted	Yes
7	Lift charge weight per device	20 grams
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	Yes
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	Yes
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Burst charges are limited to secondary effects (e.g., crossettes, inserts and shells).
100	Packaging	--
101	Packaging limits	No

3.2.3 Aerial Devices, Individual

3.2.3.5 - Mine and Shell Preloaded

	Mine and Shell Preloaded – a device that ignites and projects its effect and shell directly out of the launch tube. Effects may be pyrotechnic and/or non-pyrotechnic	
	Attribute	Requirements
1	Composition weight in finished device	60 grams
6	Lift charge permitted	Yes
7	Lift charge weight per device	20 grams
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	Yes
42	Shell required	Yes
44	Inner shells permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	Yes
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.3 Aerial Devices, Individual

3.2.3.6 - Missile - Fin Stabilized

Missile - Fin Stabilized - a device that contains a driver attached to a set of fins (primary stabilizer) which may produce a secondary effect after launching	
Attribute	Requirements
1	Composition weight in finished device 20 grams
6	Lift charge permitted No
11	Propellant charge permitted Yes
12	Propellant charge weight per tube 20 grams
13	Fountain powder permitted No
14	Burst charge permitted Yes
15	Secondary burst charge permitted No
20	Reports --
21	Reports permitted Yes
22	Weight per report 0.130 grams
23	Multiple reports permitted Yes
30	Tubes --
31	Tube required Yes
32	Multiple tubes permitted No
33	Cone required No
35	Driver tube required Yes
36	Multiple driver tubes permitted No
40	Inserts and Shells --
41	Inserts permitted Yes
50	Base, Spike and Handle Requirements --
51	Attached base required No
52	Spikes, handles, or sticks required No
53	Spikes, handles, or sticks permitted No
60	Ignition Requirements --
61	Ignition fuse required Yes
63	Ignition fuse must be safety fuse Yes
70	Chemical Restrictions --
71	Chemical Restrictions No
80	Cake, Combinations and Series --
81	Device permitted in a cake No
82	Device permitted in a combination No
83	Series applications permitted Yes
90	Special Conditions --
91	Are there any special conditions No
100	Packaging --
101	Packaging limits No

3.2.3 Aerial Devices, Individual

3.2.3.7 - Missile - Spin Stabilized

	Missile - Spin Stabilized – a device that contains a driver that sits on a launch spike attached to a base block. The driver spins (primary stabilizer) as it travels upward and may produce a secondary effect after launching	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	20 grams
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	Yes
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Device must be accompanied by a base block with an affixed launch spike.
100	Packaging	--
101	Packaging limits	No

3.2.3 Aerial Devices, Individual

3.2.3.8 – Rocket (Bottle)

	Rockets– a device that contains a driver attached to a stick for guidance and stability. Rockets may produce a secondary effect	
	Attribute	Requirements
1	Composition weight in finished device	20 grams
6	Lift charge permitted	No
11	Propellant charge permitted	Yes
12	Propellant charge weight per tube	20 grams
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	Yes
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Only sticks are permitted and must be securely attached to the tube.
100	Packaging	--
101	Packaging limits	No

3.2.3 Aerial Devices, Individual

3.2.3.9 - Roman Candle

Roman Candle - a device that expels a series of stars, shells, or other effects from a tube into the air.		
Attribute	Requirements	
1	Composition weight in finished device	20 grams
6	Lift charge permitted	Yes
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	Yes
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	Yes
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Each insert must not exceed 4g (excluding lift charge) of chemical composition.
100	Packaging	--
101	Packaging limits	No

3.2.3 Aerial Devices, Individual

3.2.3.10 - Shell Preloaded

	Shell Preloaded - a device that launches and ignites a preloaded shell into the air that bursts open and produces an effect. Effects may be pyrotechnic and/or non-pyrotechnic.	
	Attribute	Requirements
1	Composition weight in finished device	60 grams
6	Lift charge permitted	Yes
7	Lift charge weight per device	20 grams
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	Yes
42	Shell required	Yes
44	Inner shells permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
80	Cake, Combinations and Series	--
81	Device permitted in a cake	Yes
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	No
100	Packaging	--
101	Packaging limits	No

3.2.4 Cake and Combination Devices

3.2.4.1 - Cake 200

	Cake - a device that consists of multiple tubes fused together to form one device.	
	Attribute	Requirements
1	Composition weight in finished device	200 grams
3	Composition weight per tube	See individual device requirements
6	Lift charge permitted	See individual device requirements
7	Lift charge weight per device	See individual device requirements
8	Lift charge weight per tube	See individual device requirements
11	Propellant charge permitted	No
13	Fountain powder permitted	See individual device requirements
14	Burst charge permitted	See individual device requirements
15	Secondary burst charge permitted	See individual device requirements
20	Reports	--
21	Reports permitted	See individual device requirements
22	Weight per report	See individual device requirements
23	Multiple reports permitted	See individual device requirements
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	See individual device requirements
42	Shell required	See individual device requirements
44	Inner shells permitted	See individual device requirements
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	See individual device requirements
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	See individual device requirements
72	Restriction	See individual device requirements
80	Cake, Combinations and Series	--
82	Device permitted in a combination	Yes
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	See individual device requirements
100	Packaging	--
101	Packaging limits	No

3.2.4 Cake and Combination Devices

3.2.4.2 - Cake 500

	Cake - a device that consists of multiple tubes fused together to form one device.	
	Attribute	Requirements
1	Composition weight in finished device	500 grams
6	Lift charge permitted	See individual device requirements
7	Lift charge weight per device	See individual device requirements
8	Lift charge weight per tube	See individual device requirements
11	Propellant charge permitted	See individual device requirements
13	Fountain powder permitted	See individual device requirements
14	Burst charge permitted	See individual device requirements
15	Secondary burst charge permitted	See individual device requirements
20	Reports	--
21	Reports permitted	See individual device requirements
22	Weight per report	See individual device requirements
23	Multiple reports permitted	See individual device requirements
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	Yes
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	See individual device requirements
42	Shell required	See individual device requirements
44	Inner shells permitted	See individual device requirements
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	See individual device requirements
72	Restriction	See individual device requirements
80	Cake, Combinations and Series	--
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	See general requirements
100	Packaging	--
101	Packaging limits	No

3.2.4 Cake and Combination Devices

3.2.4.3 - Combination 200

	Combination—multiple devices that are fused and assembled together to form one device (e.g., a fountain combined with a helicopter).	
	Attribute	Requirements
1	Composition weight in finished device	200 grams
3	Composition weight per tube	See individual device requirements
6	Lift charge permitted	See individual device requirements
7	Lift charge weight per device	See individual device requirements
8	Lift charge weight per tube	See individual device requirements
11	Propellant charge permitted	See individual device requirements
12	Propellant charge weight per tube	See individual device requirements
13	Fountain powder permitted	See individual device requirements
14	Burst charge permitted	See individual device requirements
15	Secondary burst charge permitted	See individual device requirements
20	Reports	--
21	Reports permitted	See individual device requirements
22	Weight per report	See individual device requirements
23	Multiple reports permitted	See individual device requirements
30	Tubes	--
31	Tube required	See individual device requirements
32	Multiple tubes permitted	See individual device requirements
33	Cone required	See individual device requirements
34	Maximum inner tube diameter	See individual device requirements
35	Driver tube required	See individual device requirements
36	Multiple driver tubes permitted	See individual device requirements
40	Inserts and Shells	--
41	Inserts permitted	See individual device requirements
42	Shell required	See individual device requirements
44	Inner shells permitted	See individual device requirements
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	See individual device requirements
53	Spikes, handles, or sticks permitted	See individual device requirements
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	See individual device requirements
72	Restriction	See individual device requirements
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	See individual device requirements
100	Packaging	--
101	Packaging limits	No

3.2.4 Cake and Combination Devices

3.2.4.4 - Combination 500

	Combination—multiple devices which require spacing between each device. The devices are fused and assembled together to form one device (e.g., a fountain combined with a helicopter).	
	Attribute	Requirements
1	Composition weight in finished device	500 grams
3	Composition weight per tube	See individual device requirements
6	Lift charge permitted	See individual device requirements
7	Lift charge weight per device	See individual device requirements
8	Lift charge weight per tube	See individual device requirements
11	Propellant charge permitted	See individual device requirements
12	Propellant charge weight per tube	See individual device requirements
13	Fountain powder permitted	See individual device requirements
14	Burst charge permitted	See individual device requirements
15	Secondary burst charge permitted	See individual device requirements
20	Reports	--
21	Reports permitted	See individual device requirements
22	Weight per report	See individual device requirements
23	Multiple reports permitted	See individual device requirements
30	Tubes	--
31	Tube required	See individual device requirements
32	Multiple tubes permitted	See individual device requirements
33	Cone required	See individual device requirements
34	Maximum inner tube diameter	See individual device requirements
35	Driver tube required	See individual device requirements
36	Multiple driver tubes permitted	See individual device requirements
40	Inserts and Shells	--
41	Inserts permitted	See individual device requirements
42	Shell required	See individual device requirements
44	Inner shells permitted	See individual device requirements
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	See individual device requirements
72	Restriction	See individual device requirements
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	See general requirements
100	Packaging	--
101	Packaging limits	No

3.2.5 Reloadable Kits

3.2.5.1 - Aerial Shells, Reloadable Kit

	Reloadable Kits (Aerial Shell) – a finished device that consists of a non-preloaded launch tube with base, with no more than 12 shell components. The shells are individually placed in the launch tube and launched into the air to produce an effect.	
	Attribute	Requirements
2	Composition weight in finished kit	400 grams
4	Composition weight per reloadable shell	60 grams
6	Lift charge permitted	Yes
9	Lift charge weight per reloadable aerial shell	20 grams
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
34	Maximum inner tube diameter	50 millimeters
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	Yes
42	Shell required	Yes
43	Shell diameter (O.D.)	44.45 millimeters
44	Inner shells permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
72	Restriction	
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Maximum shell diameter is 44.45mm (1.75 inches) and inner packaging must include the launch tube. Secondary lift charge is authorized in cylindrical shells.
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	12
103	Composition weight per inner packaging	400 grams

3.2.5 Reloadable Kits

3.2.5.2 - Fountains, Reloadable Kit

	Reloadable Kits (Fountains) - a finished device that consists of a non-preloaded support tube with base, with no more than 12 fountain components. The fountains are individually placed in the tube and ignited to produce an effect.	
	Attribute	Requirements
2	Composition weight in finished kit	400 grams
5	Composition weight per reloadable component	60 grams
6	Lift charge permitted	No
7	Lift charge weight per device	Yes
8	Lift charge weight per tube	No
11	Propellant charge permitted	No
13	Fountain powder permitted	Yes
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
72	Restriction	
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Inner packaging must include the launch tube.
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	12
103	Composition weight per inner packaging	400 grams

3.2.5 Reloadable Kits

3.2.5.3 - Mines, Reloadable Kit

	Reloadable Kits (Mine) - a finished device that consists of a non-preloaded launch tube with base, with no more than 12 mine components. The mines are individually placed in the tube and ignited and the effects are launched into the air.	
	Attribute	Requirements
2	Composition weight in finished kit	400 grams
5	Composition weight per reloadable component	60 grams
6	Lift charge permitted	Yes
10	Lift charge weight per reloadable mine	20 grams
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	Yes
15	Secondary burst charge permitted	Yes
20	Reports	--
21	Reports permitted	Yes
22	Weight per report	0.130 grams
23	Multiple reports permitted	Yes
30	Tubes	--
31	Tube required	Yes
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	Yes
50	Base, Spike and Handle Requirements	--
51	Attached base required	Yes
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	Yes
63	Ignition fuse must be safety fuse	Yes
70	Chemical Restrictions	--
71	Chemical Restrictions	No
72	Restriction	
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Burst charges are limited to secondary effects (e.g., crossettes, inserts and shells). Inner packaging must include the launch tube.
100	Packaging	--
101	Packaging limits	Yes
102	Number of devices per inner packaging	12
103	Composition weight per inner packaging	400 grams

3.2.6 Miscellaneous

3.2.6.1 - Fuse

	Fuse – a core of fine grained powder surrounded by a flexible woven fabric. When ignited, it burns at a predetermined rate no faster than 2.5 cm (1”) per second. Fuse approved under these requirements can only be approved as (UN0336, Fireworks 1.4G). This entry should not be confused with Fuse, safety (UN0105) which requires laboratory examination before it can be approved as a 1.4S explosive.	
	Attribute	Requirements
1	Composition weight in finished device	150 grams
6	Lift charge permitted	No
11	Propellant charge permitted	No
13	Fountain powder permitted	No
14	Burst charge permitted	No
15	Secondary burst charge permitted	No
20	Reports	--
21	Reports permitted	No
30	Tubes	--
31	Tube required	No
32	Multiple tubes permitted	No
33	Cone required	No
35	Driver tube required	No
36	Multiple driver tubes permitted	No
40	Inserts and Shells	--
41	Inserts permitted	No
50	Base, Spike and Handle Requirements	--
51	Attached base required	No
52	Spikes, handles, or sticks required	No
53	Spikes, handles, or sticks permitted	No
60	Ignition Requirements	--
61	Ignition fuse required	No
70	Chemical Restrictions	--
71	Chemical Restrictions	No
72	Restriction	
80	Cake, Combinations and Series	--
81	Device permitted in a cake	No
82	Device permitted in a combination	No
83	Series applications permitted	Yes
90	Special Conditions	--
91	Are there any special conditions	Yes
92	Special conditions	Outer diameter of the fuse is limited to 3 millimeters. Composition is limited to 1.5 grams per linear foot. Applicant must provide a statement with the burn rate in their application.
100	Packaging	--
101	Packaging limits	Yes
103	Composition weight per inner packaging	150 grams

3.2.6 Miscellaneous

3.2.6.2 - Blank Requirements Table

Blank Requirements Table	
Attribute	Requirements
1	Composition weight in finished device [Number] (grams)
2	Composition weight in finished kit [Number] (grams)
3	Composition weight per tube [Number] (grams)
4	Composition weight per reloadable shell [Number] (grams)
5	Composition weight per reloadable component [Number] (grams)
6	Lift charge permitted Yes or No
7	Lift charge weight per device [Number] (grams)
8	Lift charge weight per tube [Number] (grams)
9	Lift charge weight per reloadable aerial shell [Number] (grams)
10	Lift charge weight per reloadable mine [Number] (grams)
11	Propellant charge permitted Yes or No
12	Propellant charge weight per tube [Number] (grams)
13	Fountain powder permitted Yes or No
14	Burst charge permitted Yes or No
15	Secondary burst charge permitted Yes or No
20	Reports --
21	Reports permitted Yes or No
22	Weight per report [Number] (grams)
23	Multiple reports permitted Yes or No
30	Tubes --
31	Tube required Yes or No
32	Multiple tubes permitted Yes or No
33	Cone required Yes or No
34	Maximum inner tube diameter [Number] (millimeters)
35	Driver tube required Yes or No
36	Multiple driver tubes permitted Yes or No
40	Inserts and Shells --
41	Inserts permitted Yes or No
42	Shell required Yes or No
43	Shell diameter (O.D.) [Number] (millimeters)
44	Inner shells permitted Yes or No
50	Base, Spike and Handle Requirements --
51	Attached base required Yes or No
52	Spikes, handles, or sticks required Yes or No
53	Spikes, handles, or sticks permitted Yes or No
60	Ignition Requirements --
61	Ignition fuse required Yes or No
62	Ignition fuse permitted Yes or No
63	Ignition fuse must be safety fuse Yes or No
70	Chemical Restrictions --
71	Chemical Restrictions Yes or No
72	Restriction [Text]
80	Cake, Combinations and Series --
81	Device permitted in a cake Yes or No
82	Device permitted in a combination Yes or No
83	Series applications permitted Yes or No
90	Special Conditions --
91	Are there any special conditions Yes or No
92	Special conditions [Text]
100	Packaging --
101	Packaging limits Yes or No
102	Number of devices per inner packaging [Number] (count)

Blank Requirements Table	
Attribute	Requirements
103	Composition weight per inner packaging [Number] (grams)

Part 4: Thermal Stability Test Requirements for Fireworks and Novelties

4.1 Introduction

All devices offered for transportation must be thermally stable. Thermal stability is assessed by subjecting a finished device or the chemical compositions as they will appear in the finished devices to a constant temperature of 75 degree C (167 degree F) for 48 consecutive hours with no ignition or marked decomposition occurring.

Safety Notes-

- When testing quantities of pyrotechnic composition in excess of several grams, the thermal stability test must be conducted in an isolated facility. Personnel must not be working in the vicinity. Barricading of the ovens must be considered.
- It is strongly recommended that the thermal stability testing not be conducted on large, intact devices, which could produce devastating consequences. The components used in such large devices should be tested rather than a completed device.
- Samples should be placed in a pan or aluminum foil to prevent/minimize oven contamination.
- The oven should be wiped cleaned after each test and fully cleaned on a regular basis.

4.2 General Requirements for Thermal Stability Testing

Testing Requirement	<ul style="list-style-type: none">• Any device approved by DOT or certified by an FCA for transportation must be thermally stable. The explosive material must not ignite spontaneously or undergo marked decomposition when subjected to a temperature of 75 degree C (167 degree F) for 48 consecutive hours.• When the thermal stability test is conducted on components rather than the finished device, the components that would be in contact with each other in the finished device must be placed in contact with each other for thermal stability testing.
Recommended Equipment	A commercial laboratory-type oven is best for conducting the thermal stability test with explosion-proof wiring. The oven must be capable of controlling temperature to ± 2 degrees C.
Safety Factors	<ul style="list-style-type: none">• Safety is critical in the performance of thermal stability tests.• It must be assumed that there is distinct possibility that the sample will ignite/explode during the test, and precautions must be taken to minimize the consequences of ignition and the resultant fire or explosion.
Recording Requirements	<ul style="list-style-type: none">• Test Date• Test Location / Company• Name of Person performing the test and Job Title• Test Results – did the device ignite, explode or undergo any significant decomposition.

Part 5: Special Provisions for Transportation

5.1 Misfired Fireworks

Misfired undamaged devices that are to be returned from the display site to the supplier shall be permitted to be transported under the EX approval of the original device and shall be packed separately from unused, unfired devices, and transported only by private motor carrier.

Shall not contain loose pyrotechnic composition.

5.2 Assembled Devices and Set Pieces

Assembled devices and Set pieces made exclusively from devices with valid EX approval and/or FCA Certification shall not require a new approval provided:

- a. The device is transported by private motor carrier
- b. The device is transported using the EX numbers and/or FC Certification for the individual components. A minimum of five EX numbers and/or FC Numbers are required unless the device contains less.

Devices that are too large to be placed in non-bulk packaging, shall be permitted to be transported by private motor carrier without external packaging to a display site. The devices must be secured against movement inside the vehicle and all pyrotechnic material must be protected against unintentional/inadvertent ignition.

5.3 Transportation of Fireworks with Fusees (highway flares) and Electric Igniters

Fusees (highway flares) and/or electric igniters for use in a firework display are permitted to be transported in a motor vehicle with fireworks, provided the flares and/or electric igniters are packaged in a separate specification package, in accordance with Title 49 CFR.

APPENDICES

APPENDIX I	Permitted and Restricted Chemicals
APPENDIX II	Applying for an Approval or Certification
APPENDIX III	Designation of a U.S. Agent of Service
APPENDIX IV	Process to Amend the Standard
APPENDIX V	General Requirements for Reverse Logistics
APPENDIX VI	Specific Requirements Pertaining to the Consumer Product Safety Commission

NOTE: While these appendices are included in this standard, they will not be incorporated by reference into Title 49 CFR. This material is for reference use only, current versions of Appendix I, II and III can be found on the PHMSA website at PHMSA.DOT.GOV.

APPENDIX I: Permitted and Restricted Chemical Table for Consumer Fireworks and Novelties

1. Permitted and Restricted Chemical Table for Consumer Fireworks and Novelties is controlled by PHMSA (see the PHMSA website for the current table). Any requests for modifications must be submitted to PHMSA for review at fireworks@dot.gov.
2. Under the provisions of this standard, only chemicals listed in the Permitted and Restricted Chemical Table for Consumer Fireworks and Novelties may be used in the manufacturing of consumer firework devices and novelties.
3. Devices may not contain any chemical not listed in the Permitted and Restricted Chemical Table for Consumer Fireworks and Novelties, except in amounts less than 0.25 percent by weight as impurities.
4. A manufacturing tolerance of up to one (1) percent is permitted for individual chemicals used in consumer firework devices and novelty device formulations (excluding red phosphorus and silver fulminate).
5. Specific restrictions for individual chemicals are provided in the Permitted and Restricted Chemical Table for Consumer Fireworks and Novelties.

Permitted and Restricted Chemical Table for Consumer Fireworks and Novelties

Only chemicals in the table below are permitted to be used in devices manufactured under this standard. Using any combination of these chemicals to produce an effect in a finished device must comply with the total chemical composition limits in rows 1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 22 and 103 of the requirement tables in PART 3.

Permitted and Restricted Chemicals for Consumer Fireworks and Novelties (APA 87-1A)			
Chemical	Formula	Typical Use	Restrictions
Alloprene (Chlorinated Rubber)	Not Required	Color Intensifier	
Aluminum > 149 microns	Al	Fuel	Not to exceed 10 percent by weight in a burst charge formulation or a propellant formulation
Aluminum > 53 to ≤ 149 microns	Al	Fuel	Not permitted in burst charge
Aluminum ≤ 53 microns	Al	Fuel	Permitted only in reports
Ammonium Dichromate	(NH ₄) ₂ Cr ₂ O ₇	Oxygen Donor / Colored Ash	1) Not to exceed 5 percent of formulation; 2) Prohibited if mixed with a chlorate.
Ammonium Perchlorate	NH ₄ ClO ₄	Oxygen Donor	1) Prohibited if mixed with a chlorate; 2) In sparkler or dipped stick the total composition is limited to 5 grams.
Antimony	Sb	Fuel	
Antimony Sulfide	Sb ₂ S ₃	Fuel	
Antimony Trioxide	Sb ₂ O ₃	Oxygen Donor	

Permitted and Restricted Chemicals for Consumer Fireworks and Novelties (APA 87-1A)

Barium Carbonate	BaCO ₃	Color Agent	
Barium Chlorate	Ba(ClO ₃) ₂	Oxygen Donor / Color Agent	1) In smoke formulations an equal or greater weight of bicarbonates or carbonates is required; 2) In all other devices the total chemical composition cannot exceed 4 grams of which no more than 15 percent can be chlorate salts; 3) Permitted in firecrackers, party poppers and booby traps.
Barium Nitrate	Ba(NO ₃) ₂	Oxygen Donor / Color Agent	
Barium Oxalate	BaC ₂ O ₄	Color Agent	
Barium Phthalate	Ba(C ₈ H ₅ O ₄) ₂	Whistle / Color Agent	Not to exceed 10 percent by weight in a burst charge formulation
Barium Sulfate	BaSO ₄	Oxygen Donor / Color Agent	
Benzoic Acid	C ₆ H ₅ COOH	Whistle	Not to exceed 10 percent by weight in a burst charge formulation
Bismuth Trioxide (Bismuth Oxide)	Bi ₂ O ₃	Oxygen Donor	
Boric Acid (Boracic Acid)	H ₃ BO ₃	Neutralizer	
Calcium Carbonate	CaCO ₃	Neutralizer	
Calcium Sulfate	CaSO ₄	Oxygen Donor	
Calcium Sulfate (Gypsum)	CaSO ₄ ×2H ₂ O	Oxygen Donor	
Cationic Asphalt	Not Required	Fuel	
Charcoal (Carbon)	C	Fuel	
Chlorinated Rubber	Not Required	Color Intensifier	
Chlorinated Wax (Chlorinated Paraffin)	Not Required	Color Intensifier	
Copper Benzoate	Cu(C ₆ H ₅ CO ₂) ₂	Whistle / Color Agent	Not to exceed 10 percent by weight in a burst charge formulation
Copper (II) Salts (Cupric Salts) Acetates, Carbonates, Chlorides, Oxides, and Sulfates, etc		Color Agent	Prohibited if mixed with a chlorate
Copper Metal	Cu	Color Agent	Particle size is not required
Cryolite (Sodium Hexafluoroaluminate)	Na ₃ AlF ₆	Color Agent	
Cuprous Chloride (Copper Chloride)	Cu ₂ Cl ₂	Color Agent	
Cuprous Oxide (Copper Oxide)	Cu ₂ O	Color Agent	
Dextrin or Dextrine	Not Required	Binder/Fuel	

Permitted and Restricted Chemicals for Consumer Fireworks and Novelties (APA 87-1A)			
Dicopper chloride trihydroxide	$\text{Cu}_2(\text{OH})_3\text{Cl}$	Color Agent	Prohibited if mixed with a chlorate
Diphenylamine	$(\text{C}_6\text{H}_5)_2\text{NH}$	Stabilizer	
Epoxy (Thermosetting polymer)	Not Required	Binder	
Flour (Wheat, Corn or Rice)	Not Required	Binder	
Glucose	$\text{C}_6\text{H}_{12}\text{O}_5$	Binder	
Hexachlorophene (Nabac)	$\text{C}_{13}\text{H}_6\text{Cl}_6\text{O}_2$	Fuel	
Hexamethylenetetramine (Hexamine)	$\text{C}_6\text{H}_{12}\text{N}_4$	Fuel	
Iron	Fe	Fuel / Sparks	Particle size is not required
Iron (II, III) Oxide (Black)	Fe_3O_4 or FeO & Fe_2O_3	Oxygen Donor	
Iron (III) Oxide (Red)	Fe_2O_3	Oxygen Donor	
Iron/Titanium Alloy (Ferro/Titanium)	Fe/Ti	Fuel / Sparks	Particle size is not required
Isophthalic Acid (Meta-Phthalic Acid)	$\text{C}_6\text{H}_4(\text{COOH})_2$	Whistle	Not to exceed 10 percent by weight in a burst charge formulation
Lactose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	Binder/Fuel	
Lampblack	C	Fuel	
Linseed Oil	Not Required	Fuel	
Magnalium > 149 microns	Mg/Al	Fuel	Not to exceed 10 percent by weight in a break charge formulation or a propellant formulation
Magnalium > 53 to ≤ 149 microns	Mg/Al	Fuel	Not permitted in break charge
Magnalium ≤ 53 microns	Mg/Al	Fuel	Permitted only in reports
Magnesium Carbonate	MgCO_3	Neutralizer	
Magnesium Stearate	Not Required	Binder	
Magnesium Sulfate	MgSO_4	Oxygen Donor	
Naphthol Pitch	Not Required	Fuel	Permitted only in snakes
Nitrated Asphalt	Not Required	Fuel	Permitted only in snakes
Nitrated Asphaltum	Not Required	Fuel	Permitted only in snakes
Nitrated Bitumen	Not Required	Fuel	Permitted only in snakes
Nitrated Pitch	Not Required	Fuel	Permitted only in snakes
Nitrated Tar	Not Required	Fuel	Permitted only in snakes
Nitrocellulose ≤ 12.6 percent nitrogen by mass	Not Required	Fuel	1) Single tube devices are limited to 15 grams; 2) Multiple tube devices are limited to less than or equal to 10 grams per tube and less than or equal to 100 grams per device.

Permitted and Restricted Chemicals for Consumer Fireworks and Novelties (APA 87-1A)

Nitrocellulose Lacquer ≤ 12.6 percent nitrogen by mass	Not Required	Binder	Limited to 5 percent of formulation
Par Oil (Chlorinated Wax)	Not Required	Color intensifier	
Parlon (Chlorinated rubber)	Not Required	Color intensifier	
Phosphorus - (Red)	P (Red)	Fuel	Permitted in party poppers and booby traps only
Phthalic Acid (<i>Ortho</i> -Phthalic Acid)	$C_6H_4(COOH)_2$	Whistle	Not to exceed 10 percent by weight in a burst charge formulation
Polyvinyl Alcohol (PVA)	$[CH_2CH(OH)]_n$	Binder	
Polyvinyl Butyral (PVB)	$(C_8H_{14}O_2)_n$	Binder	
Polyvinyl Chloride (PVC)	$(C_2H_3Cl)_n$	Color Intensifier	
Polyvinylidene chloride (Saran Resin)	$(C_2H_2Cl_2)_n$	Color Intensifier	
Potassium Benzoate	$KC_6H_5CO_2$	Whistle	Not to exceed 10 percent by weight in a break charge formulation
Potassium Chlorate	$KClO_3$	Oxygen Donor	1) In smoke formulations an equal or greater weight of bicarbonates or carbonates is required; 2) In all other devices the total chemical composition cannot exceed 4 grams of which no more than 15 percent can be chlorate salts; 3) Permitted in firecrackers, party poppers and booby traps.
Potassium Dichromate (Potassium Bichromate)	$K_2Cr_2O_7$	Oxygen Donor	Not to exceed 5 percent of the formulation
Potassium Fluorosilicate	K_2SiF_6	Color Intensifier	
Potassium hexafluoroaluminate (Cryolite)	K_3AlF_6	Color Agent	
Potassium Hydrogen Phthalate (KHP)	$KC_8H_5O_4$	Whistle	Not to exceed 10 percent by weight in a break charge formulation
Potassium Nitrate	KNO_3	Oxygen Donor	
Potassium Oxalate	$K_2C_2O_4$	Color Agent	
Potassium Perchlorate	$KClO_4$	Oxygen Donor	In sparkler or dipped stick the total composition is limited to 5 grams
Potassium Silicofluoride	K_2SiF_6	Color Intensifier	
Potassium Sulfate	K_2SO_4	Oxygen Donor	
Red Gum (Accaroid Resin)	Not Required	Binder	

Permitted and Restricted Chemicals for Consumer Fireworks and Novelties (APA 87-1A)			
Resinox (Phenolic Resin)	Not Required	Binder	
Rice Flour (Rice Starch)	Not Required	Binder	
Rice Hull	Not Required	Density Control	
Rice Hull (Coated)	Not Required	Fuel	Specify chemical formulation of the coating
Salicylic Acid	$C_6H_4(OH)COOH$	Whistle	Not to exceed 10 percent by weight in a break charge formulation
Shellac	Not Required	Binder	
Silica	$SiO_2 \cdot nH_2O$	Moisture Absorber	
Silicon	Si	Fuel	
Silver	Ag	Fuel	Particle size is not required
Silver Fulminate	$AgCNO$	Explosive	Permitted in Snappers and Novelty Pull Apart Crackers only
Silver Oxide	Ag_2O	Oxygen Donor	
Smoke Dye (Blue) Lysine	$C_6H_{14}N_2O_2$	Smoke Dye	
Smoke Dye (Blue) Methylene Blue	$C_{16}H_{18}ClN_3S$	Smoke Dye	
Smoke Dye (Blue) Phthalocyanine (Blue)	$C_{32}H_{16}CuN_8$	Smoke Dye	
Smoke Dye (Blue) Ultramarine	$Na_2S_2 \ddot{Y}$ $3NaAlSiO_4$	Smoke Dye	
Smoke Dye (Green) 1,4-di-p-toluidino-anthraquinone (Solvent Green 3)	$C_{26}H_{20}O_2(NH)_2$ $(CH_3)_2$	Smoke Dye	
Smoke Dye (Green) Lysine – 2, 6-diaminohexanoic acid	$C_6H_{14}N_2O_2$	Smoke Dye	
Smoke Dye (Orange) a-xylene-azo-b-naphthol (Orange 7)	$C_{16}H_{11}N_2NaO_4S$	Smoke Dye	
Smoke Dye (Orange) Oil Orange Pigment	$C_{26}H_{28}N_2O_2$	Smoke Dye	
Smoke Dye (Red) 1-methylamino-anthraquinone (Disperse Red 9)	$C_{15}H_{11}NO_2$	Smoke Dye	
Smoke Dye (Red) 1-Naphthalenol, 4-[(4-ethoxyphenyl)azo] (Solvent Red 3)	$C_{18}H_{16}N_2O_2$	Smoke Dye	
Smoke Dye (Red) Para Red (Pigment Red1) (p-nitroaniline red)	$C_{16}H_{11}N_3O_3$	Smoke Dye	

Permitted and Restricted Chemicals for Consumer Fireworks and Novelties (APA 87-1A)			
Smoke Dye (Violet) 1,4-diamino-2,3- dihydroanthraquinone	$C_{14}H_{12}N_2O_2$	Smoke Dye	
Smoke Dye (Violet) Rhodamine B (Basic Violet 10)	$C_{28}H_{31}ClN_2O_3$	Smoke Dye	
Smoke Dye (Yellow) 2-(2-quinolyl)-1, 3- indandione (Chinoline Yellow) (Solvent Yellow 33)	$C_{18}H_{11}O_2N$	Smoke Dye	
Smoke Dye (Yellow) Auramine (Basic Yellow 2)	$C_{17}H_{22}ClN_3$	Smoke Dye	
Smoke Dye (Yellow) Dibenzo(a,h)pyrene-7,14- dione (Dibenzochrysenedione) (Dibenzpyrenequinone) (Golden Yellow GK) (Tyrian Yellow I-GOK) (Vat Yellow 4)	$C_{24}H_{12}O_2$	Smoke Dye	
Smoke Dye (Yellow) Methyl Yellow (Butter Yellow); Dimethyl Yellow; 4- Dimethylaminoazobenzene (N, N-Dimethyl-4- phenylazoaniline) (Solvent Yellow 2) (Oil Yellow)	$C_{14}H_{15}N_3$	Smoke Dye	
Sodium Benzoate	$NaC_6H_5CO_2$	Whistle	Not to exceed 10 percent by weight in a break charge formulation
Sodium Bicarbonate (Sodium Hydrogen Carbonate)	$NaHCO_3$	Neutralizer	
Sodium Carbonate	Na_2CO_3	Neutralizer	
Sodium Chlorate	$NaClO_3$	Oxygen Donor	1) In smoke formulations an equal or greater weight of bicarbonates or carbonates is required; 2) In all other devices the total chemical composition cannot exceed 4 grams of which no more than 15 percent can be chlorate salts; 3) Permitted in firecrackers, party poppers and booby traps.
Sodium Fluorosilicate	Na_2SiF_6	Color Intensifier	
Sodium hexafluoroaluminate (Cryolite)	Na_3AlF_6	Color Agent	
Sodium Nitrate	$NaNO_3$	Oxygen Donor	

Permitted and Restricted Chemicals for Consumer Fireworks and Novelties (APA 87-1A)			
Sodium Oxalate	$\text{Na}_2\text{C}_2\text{O}_4$	Color Agent	
Sodium Salicylate	$\text{C}_7\text{H}_5\text{NaO}_3$	Whistle	Not to exceed 10 percent by weight in a break charge formulation
Sodium Silicofluoride	Na_2SiF_6	Color Intensifier	
Sodium Sulfate	Na_2SO_4	Oxygen Donor	
Starch (Amylum) (Wheat, Corn, Rice)	Not Required	Binder	
Stearic Acid (Octadecanoic Acid)	Not Required	Fuel	
Strontium Carbonate	SrCO_3	Color Agent	
Strontium Chloride	SrCl_2	Color Agent	
Strontium Nitrate	$\text{Sr}(\text{NO}_3)_2$	Oxygen Donor / Color Agent	
Strontium Oxalate	SrC_2O_4	Color Agent	
Strontium Phthalate	$\text{Sr}(\text{C}_8\text{H}_5\text{O}_4)_2$	Whistle / Color Agent	Not to exceed 10 percent by weight in a break charge formulation
Strontium Sulfate	SrSO_4	Color Agent	
Sucrose	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	Fuel	
Sulfur	S	Fuel	
Terphthalic Acid (Para-Phthalic Acid)	$\text{C}_6\text{H}_4(\text{COOH})_2$	Whistle	Not to exceed 10 percent by weight in a burst charge formulation
Titanium > 149 microns	Ti	Fuel	Not to exceed 10 percent by weight in a break charge formulation or a propellant formulation
Wood Powder (Cellulose)	Not Required	Fuel	

APPENDIX II Applying for an Approval or Certification

1. Introduction

There are three options a manufacturer may use to obtain authorization to transport consumer fireworks as Fireworks, UN0336, 1.4G:

1. Submit an application to U.S. DOT/PHMSA Approvals for an EX Number for devices manufactured in accordance with the applicable requirements in 49 CFR § 173.64 fireworks@dot.gov.
2. Submit an application to U.S. DOT/PHMSA Approvals for an explosive in accordance with 49 CFR § 173.56. Additional information can be found on the PHMSA website.
3. Submit an application to a Fireworks Certification Agency (FCA) authorized by U.S. DOT. FCAs review the device in accordance with 49 CFR § 173.65. A list of the approved FCA's can be found on the PHMSA website.

2. Procedures for obtaining an approval in accordance with 49 CFR § 173.64

Complete a fireworks approval application	See Sample Application in Part 5.
Applications must contain seven key elements	<ol style="list-style-type: none"> a. Identification of the applicant; b. Selection of the device category; c. Description of the device, dimensions and composition limits; d. Chemical Formulation Sheet (list of all effects and chemicals used to produce the effects); e. Diagram of device (with labels identifying the major components of the device); f. Thermal Stability Test results (must be certified with test date); and g. Signed Certification with compliance with the APA Standard 87-1A
Application cover sheet should contain the following elements	<ol style="list-style-type: none"> a. Identification of the applicant; and b. Summary of request.
U.S. Designated Agent Letter	All foreign applicants must have and submit a copy of their U.S. Designated Agent Letter with each application.
Submit an application package to DOT/PHMSA	<p>The package should include a cover letter, an application (includes description of the device, diagram(s) and chemical formulation sheet(s)) and U.S. Agent letter.</p> <p>The application package can be submitted three ways:</p> <ol style="list-style-type: none"> 1. Mail: U.S. Department of Transportation Office of Hazardous Materials Transportation Approvals and Permits PHH-32 1200 New Jersey Avenue, SE East Building, 2nd Floor, Washington, DC 20590-0001. 2. Email: fireworks@dot.gov 3. Online: PHMSA online application ADD WEB LINK
Contact	APA:

Information	Ms. Julie L. Heckman American Pyrotechnics Association 301-907-8181 or jheckman@americanpyro.com PHMSA: Chief of Energetic Materials U.S. Department of Transportation 202-366-4512 or fireworks@dot.gov
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3. Example of EX Application Cover Letter

<p>Your Corporate Letterhead</p>
<p>(Date of Letter)</p>
<p>U.S. Department of Transportation Office of Hazardous Materials Transportation Approvals and Permits PHH-32 1200 New Jersey Avenue, SE East Building, 2nd Floor, Washington, DC 20590-0001</p>
<p>Chief of Energetic Materials:</p>
<p>We wish to request an approval for the device described in the enclosed firework application, submitted under the provisions of 49 CFR § 173.64.</p>
<p>Classification is requested for this device as Fireworks UN0336, 1.4G</p>
<p>The approval letter, or any questions regarding this application, should be sent to the address listed on the enclosed application or you may send questions via email to: _____.</p>
<p>Thank you for your attention to our request.</p>
<p>Sincerely,</p>
<p>Signature, Title</p>

4. Application Sheet Criteria - the following table provides the criteria and information required to complete an EX application. The application must be in English.

Criteria	Description
Item Name	<ul style="list-style-type: none"> a. Item Name, item name of the series (if applicable) and/or an Item Number/Code should be provided to identify the product. b. The identifier (i.e.:Item Name or Item Code) must be constant throughout the application.
Name and Address of Manufacturer Applicant	<ul style="list-style-type: none"> a. Must be the manufacturer of the device. b. Name of a responsible person (and their job title) at the applicant company c. Provide telephone number, fax number and email address.
Designated US Agent	<ul style="list-style-type: none"> a. Include a designated U.S. Agent of Service in accordance with 49 CFR §105.40. b. Provide the name of designated agent, telephone number, fax number and email address.
Manufacturer's information	<ul style="list-style-type: none"> a. Provide company name b. Physical address of the facility c. Name and title of applicant d. Phone number e. Email address.
DOT Class	DOT classification on application clearly identified
Device Category	<ul style="list-style-type: none"> a. The Category of the device must be identified in the application. b. If not listed in APA 87-1A, the application can be submitted in accordance with 49 CFR §173.56.
Description of Device	A clear definition of the device, explaining the effects produced must be included.
Packaging Requirements	Where specific packaging requirements are critical to the classification of the product, the applicant must comply with the packaging requirements.
Thermal Stability Test	<ul style="list-style-type: none"> a. Tester name and title b. Testing location c. Tested item: finished product or component chemical mixtures d. Test date and results.
Signed and Dated	Application must be signed and dated by the person identified in Section ii above.

5. Sample EX Application:

1. Item Name [Product Code]: 11335 FANTASYLAND [AX321]
2. This is a series application (Y/N): N
3. Manufacturer: (Manufacturer located outside the U.S., must complete item # 4)

Name/Title: Joseph Smith, Manager
Company Name: Smith Liling Fireworks Mfg. Co.
Address: P.O. Box 5000, Liuyang City, Hunan, China 410317
Phone: 86-707-234-XXXX
Fax: 86-707-234-XXXX
Email: smithfireworks@smithchina.com

Physical Manufacturing Location (if different from address above):

Company Name: Smith Liling Fireworks Mfg. Co. (company name must be the same as above)
Address: Huanglai Town, Liuyang City, Hunan, China 410317
Phone: 86-707-234-XXXX
Fax: 86-707-234-XXXX
Email: smithfireworks@smithchina.com

4. Designated U.S. Agent of Service (attached)

Name/Title: Margie Smith/Vice-President
Company Name: Smith Fireworks, Inc.
Address: 236 Fireworks Lane, Sunset, KS 63456
Phone: (718) 555-XXXX
Fax: (718) 555-XXXX
Email: msmith@smithfireworks.com

5. DOT UN Number, Proper Shipping Name, Hazard Division_:

UN0336, Fireworks, 1.4G

6. Category of Device: (under APA 87-1A)

3.2.2 Ground Devices

- 3.2.2.1 - Chaser
- 3.2.2.2 - Crackling Ball
- 3.2.2.3 - Crackling Strip
- 3.2.2.4 - Crackling Tube
- 3.2.2.5 - Firecracker
- 3.2.2.6 - Flasher / Strobe
- 3.2.2.7 - Flitter Sparkler
- 3.2.2.8 - Fountain Cone
- 3.2.2.9 - Fountain Cylindrical
- 3.2.2.10 - Fountain Nitrocellulose
- 3.2.2.11 - Ground Spinner
- 3.2.2.12 - Illuminating Torch
- 3.2.2.13 - Smoke
- 3.2.2.14 - Snake
- 3.2.2.15 - Specialty Device
- 3.2.2.16 - Wheel
- 3.2.2.17 - Wire Sparkler or Dipped Stick

3.2.3 Aerial Devices

- 3.2.3.1 - Aerial Spinner
- 3.2.3.2 - Girandola
- 3.2.3.3 - Helicopter
- 3.2.3.4 - Mine Preloaded
- 3.2.3.5 - Mine and Shell Preloaded
- 3.2.3.6 - Missile - Fin Stabilized
- 3.2.3.7 - Missile - Spin Stabilized
- 3.2.3.8 - Rocket (Bottle)
- 3.2.3.9 - Roman Candle
- 3.2.3.10 - Shell Preloaded

3.2.4 Cake and Combination Devices

- 3.2.4.1 - Cake 200*
- 3.2.4.2 - Cake 500*
- 3.2.4.3 - Combination 200*
- 3.2.4.4 - Combination 500*

3.2.5 Reloadable Kits

- 3.2.5.1 - Aerial Shells, Reloadable Kit
- 3.2.5.2 - Fountains, Reloadable Kit
- 3.2.5.3 - Mines, Reloadable Kit

3.2.6 Miscellaneous

- 3.2.6.1 – Fuse (Burn Rate _____ cm/sec)

* When selecting Cake or Combination Device, check the appropriate categories under 3.2.2.and/or 3.2.3 that are used in the device (e.g., “Fountain and Mine”).

- 7. Diagram of the Device and Diagram Component Table: (attached)
- 8. Chemical Composition: (attached)
- 9. Description of Device (weights are considered maximum):

Number of tubes containing composition:	_____ 7
Total composition weight per tube(s) (grams):	_____ 20, 23
Total lift charge per tube (grams) if applicable:	_____ N/A
Total lift charge in device (grams) if applicable:	_____ N/A
Is the burst charge below 25% in all tubes if applicable:	_____ N/A
Total burst charge in device (grams)if applicable:	_____ N/A
Does item have a report? (Yes / No):	_____ NO
Weight of individual report (grams) if Yes above:	_____ N/A
Total weight of report in device (grams) if applicable:	_____ N/A
Number of reports in the device if applicable:	_____ N/A
Total composition in device (grams):	_____ 155
Total composition per inner packaging (grams)	
if device limits composition weight per inner packaging:	_____ N/A
Are tubes fused in sequence (Yes / No):	_____ YES
Tube separation for devices over 200 grams (mm):	_____ N/A

10. Reloadable Kits: N/A
- Number of launch tubes per kit: _____
- Number of shells, fountains or mines per kit: _____
- Lift charge per shell or mine (grams): _____
- Burst charge per shell or mine (grams): _____
- Total composition per shell, fountains or mines (grams) _____
- Total composition per kit (grams): _____
- Do the shells or mines contain a report? (Yes/no) _____
- Weight of individual report(s) (grams): _____
- Number of reports: _____
- Total weight of report in the kit (grams): _____

11. Thermal stability test results:

A thermal stability test of this device was completed on

<u>7/02/14</u>	<u>Mr. Smith</u>	<u>Supervisor</u>	<u>Smith Fireworks Mfg. Co.</u>
Date	Name of Tester	Job Title	Company

The test was performed on: finished item component chemical mixtures, as present together in the device. The device did not ignite, explode, or undergo any significant decomposition during heating at 75° C (167° F) for 48 hours.

12. Certification:

This is to certify that the device for which approval is requested conforms to APA Standard 87-1A and that the descriptions and technical information contained in this application are complete and accurate. Only an authorized representative from the company can certify the firework application.

No duplicate application has been submitted to a fireworks certification agency.

8/01/14
Date

(_____)
Signature of applicant named above

Mr. Joseph Smith
Typed name of applicant, in English

Chemical Composition Sheet

1. Item Name [Product Code]: 11335 FANTASYLAND [AX321]

Total composition in device (grams): 155

Name and Weight for each composition in the device (grams):

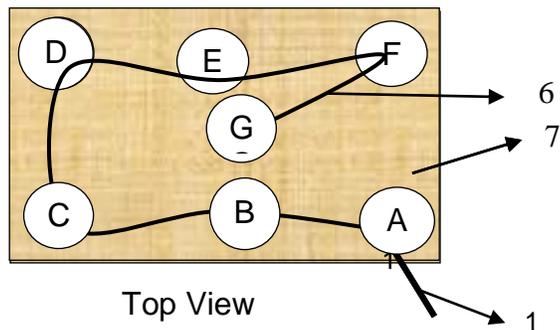
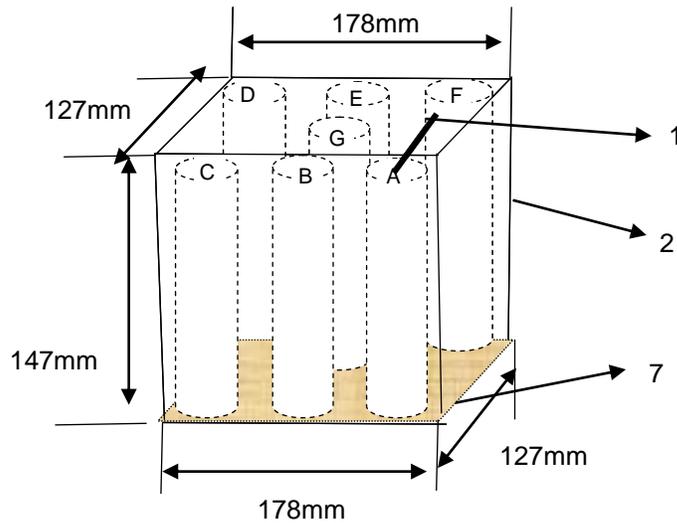
1. Fountain Powder 85 2. Red Sparks 12 3. Blue Sparks 6
 4. Green Sparks 12 5. Whistling Titanium Sparks 40

Chemicals	Formulas	1	2	3	4	5	6	7
Potassium Nitrate	KNO ₃	65						
Potassium Perchlorate	KClO ₄		40	15	56	50		
Barium Nitrate	Ba(NO ₃) ₂			55				
Strontium Carbonate	SrCO ₃		20					
Sulfur	S	5			10			
Charcoal	C	30						
Aluminum > 53 Microns	Al							
Magnalium > 53 Microns	Al-Mg		20	15	2			
Copper Oxide	CuO				17			
Cryolite	Na ₃ AlF ₆							
Shellac (Lac)	C ₁₆ H ₂₄ O ₅		6					
Polyvinyl chloride	(C ₂ H ₃ CL) _n		10	7	10			
Phenolic Resin	C ₄₈ H ₄₂ O ₇		4	8	5			
Restricted Chemicals								
Aluminum ≤ 53 Microns	Al							
Magnalium ≤ 53 Microns	Al-Mg							
Potassium Benzoate	KC ₆ H ₅ CO ₂					30		
Potassium Chlorate	KClO ₃							
Titanium >149 Microns	Ti					20		
Total Weight Percent		100	100	100	100	100		

Diagram of Device

Item Name [Product Code]: 11335 FANTASYLAND [AX321]

Item Name: 11335 FANTASYLAND (AX321)



Item is fused sequentially starting at tube A and ending at G.

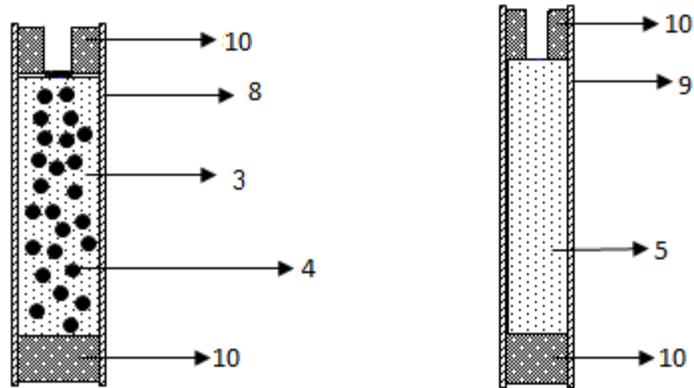
Tube A and E emits red sparks

Tube B emits blue sparks

Tube C and F emits green sparks

Tube D and G emits whistling titanium sparks

Tube Appearance



Powder Tubes A, B, C, E, F

Powder Tubes D, G

Diagram Component Table

No.	Description	Dimension(s) mm)	Inner Diameter (mm)	Outer Diameter (mm)	Total Composition Weight (g)
1	Ignition Fuse (only in first tube A)				
2	Finished device	178 x 127 x 147			
3	Fountain Powder (per tubes A,B,C,E,F)				17
4	Effect Composition (per tubes A,B,C,E,F)				6
5	Effect Composition (per tubes D,G)				20
6	Connecting Fuse				
7	Cardboard Base	178 x 127 x 2			
8	Powder Tubes A B C E and F	145	17	22	
9	Powder Tubes D and G	145	16	20	
10	Clay Plug				
	TOTAL COMPOSITION				155

For a blank application, see the PHMSA website.

APPENDIX III Designation of a U.S. Agent of Service

Instructions for Designating a U.S. Agent of Service as required by 49 CFR § 105.40. If the manufacturer is a non-resident of the United States, the manufacturer is required to designate a permanent resident (individual, firm, or a domestic corporation) of the United States to act as their U.S. Designated Agent and receive documents on their behalf. The non-resident manufacturer may have more than one U.S. Designated Agent and a copy of the designation must be submitted with each application.

3.1 Designated Agent(s):

- May be an individual, firm, or a domestic corporation,
- May represent any number of principals,
- May not reassign responsibilities under a designation to another person.

3.2 A designation must:

- Be written, signed and dated,
- Identify the section in the Hazardous Materials Regulations that requires you to file a designation,
- Description of the activity the designation will provide,
- Certify that the designation is in the correct legal form required to make it legal and binding under the laws, corporate bylaws, and other requirements that apply to designations at the time and place you are making the designation,
- Provide the applicant's full legal name, the principal name of the business, and mailing address. Although not required the inclusion of electronic contact information (i.e. email, fax and phone number) allows for a more expedited processing of the approvals,
- Statement the designation will remain in effect until you withdraw or replace it,
- Provide the full legal name and mailing address of the U.S. Designated Agent. Although not required the inclusion of electronic contact information (i.e., email, fax and phone number) allows for a more expedited processing of the approvals.
- A declaration of acceptance signed by both the non-resident company and the designated agent, and
- Any additional information if required.

3.3 Additional Information:

- Refer to §§ 105.40 and 107.705 for any additional information or requirements.

3.4 Sample Letter:

Suggested Sample Letter – Designation of U.S. Agent of Service in accordance with 49 CFR § 105.40.

Submit on Company Letterhead

Note: The “Letter of Designation” needs to be signed and dated by both parties

(date of letter)

To:
U.S. Department of Transportation
Pipeline and Hazardous Materials Safety
Administration, Approvals and Permits (PHH-30)
1200 New Jersey Avenue, SE
East Building, 2nd Floor
Washington, DC 20590-0001

From:
ABC China, Inc.
2222 Beijing Road
Beihai, Guangxi, China 536000
E-mail address
Phone number
Fax number

Director, Approvals and Permits

ABC China, Inc. is filing this designation of agent for service, in accordance with 49 CFR §105.40. The US based agent of service listed below will represent us on matters concerning firework applications submitted to U.S. Department of Transportation.

Joe Round Manager
Global Drive
2000 N. Pacific Blvd., Suite 1
Portland, OR 12345
EMAIL: xyz@globaldrive.com
TEL: (212) yyy-yyyy
FAX: (212) xxx-xxxx

This designation is legal and binding in accordance with 49 CFR §105.40(b)(2) and will remain in effect until it is withdrawn or replaced by us. By the dated signatures below ABC China, Inc. accepts this designation of agent and Global Drive accepts the agent's responsibilities.

PRINCIPAL

Name/Title: John Smith / Manager
Company: ABC China, Inc.

Signed: _____
Date: _____

AGENT

Name/Title: Joe Round/ Manager
Company: Global Drive

Signed: _____
Date: _____

APPENDIX IV: Process to Amend the APA Standard 87-1A

1. Scope - The purpose of this Appendix is to illustrate the procedures to be utilized in correcting any errors in the material presented in this standard, and to address any new regulation changes that may appear before the next scheduled review cycle.
2. Frequency of new editions of APA Standard 87-1A - The document shall be reviewed during the end of the third year following publication of a new edition of the standard. The APA Standards Committee shall be responsible for initiating each review of the document, with the goal of finalizing the next edition of the standard within five years from date of incorporation of the previous edition into Title 49 CFR.
3. Procedure for Revising the Standard
 - a. A notice shall appear in an APA Bulletin advising the Association membership that a review of the document is about to commence, and inviting comments and suggestions from interested parties.
 - b. Fireworks trade publications shall be notified that a review of APA 87-1A is underway, and that comments regarding possible changes to the standard should be sent by regular mail, express delivery, or by email to the APA office.
 - c. The APA office will formally notify Federal agencies that are involved in the regulation of fireworks that revisions to the standard are underway, and that comments from the agencies will be considered by the APA Standards Committee for inclusion in the new edition. These agencies will include the U. S. Consumer Product Safety Commission; the U.S. Department of Justice's Bureau of Alcohol, Tobacco, Firearms & Explosives; U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration; the U.S. Department of Labor's Occupational Safety & Health Administration; and the U.S. Environmental Protection Agency.
 - d. A minimum of a 30-day notice shall be provided to all interested parties that the revision is underway and comments on the new edition will be accepted until a specified date.
 - e. Following this comment period, the APA Standards Committee shall meet to review all comments that have been received. The timing of the meeting shall coincide with regularly scheduled meetings of the APA.
 - f. The Committee shall meet and discuss the comments that have been received regarding changes to the standard. The Committee shall decide by majority vote to accept, reject, or modify the recommended changes. If necessary, the Committee shall develop additional changes to the standard based on input from Committee members.
 - g. The approved changes shall be incorporated into a revised version of the standard, and a copy of the draft document shall be forwarded to the APA Board of Directors for their review and approval. Any changes requested by the Board shall become part of the final draft version.
 - h. The final draft version of the new edition of the standard shall then be formally submitted to the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the U.S. Department of Transportation for their review and comments. Any comments from PHMSA shall then be circulated among the members of the APA Standards Committee, and the comments will either be accepted or held for further study and discussion with PHMSA.

i. Once both parties (APA and PHMSA) are satisfied with the content of the document, the standard shall be returned to the APA Board of Directors for formal adoption, and then officially submitted to PHMSA for incorporation by reference into 49 CFR § 171.7(f)(1).

j. The date of incorporation of the new edition of the standard into 49 CFR § 171.7 shall serve as the effective date for the new edition of the standard.

APPENDIX V: General Requirements for Reverse Logistics

1. Refer to 49 CFR § 173.157 Reverse logistics

APPENDIX VI: Specific Requirements Pertaining to the Consumer Product Safety Commission

1. Consumer Fireworks - Classification, Types and Requirements

1.1 Introduction- Definition

1.1.1 Consumer Fireworks are defined as follows:

Consumer Fireworks	Includes devices in a finished state, suitable for use by the general public that comply with the construction, performance, composition, and labeling requirements promulgated by Consumer Product Safety Commission (CPSC) in <i>Title 16 CFR</i> and the requirements set forth in <i>APA Standard 87-1A</i> .
Mandating Agency	The primary agency that is responsible for consumer fireworks product safety is the U.S. Consumer Product Safety Commission.

1.1.2 Classification

Class	Application
Fireworks, UN0336, 1.4G	Fireworks, UN0336, 1.4G is the United States designator for consumer fireworks utilized for the transportation of consumer fireworks in accordance with the guidelines set forth in Title 49 CFR.
Novelties, Not Regulated As An Explosive	Novelties are treated as fireworks by the U.S. Consumer Product Safety Commission, and shall comply with the chemical composition, construction, labeling, and performance regulations in this Chapter.

1.2 General Requirements

Nomenclature	Requirements
Aerial Bomb	<ul style="list-style-type: none"> • A tube device that fires an explosive charge into the air without added visual effect.
Bases	<ul style="list-style-type: none"> • Bases shall remain firmly attached to the item during transportation, handling, and normal operation. • The base or bottom of fireworks devices that are operated in a

	<p>standing upright position shall have the minimum horizontal dimensions or the diameter of the base equal to at least one-third of the height of the device, including any base or cap affixed thereto, but excluding any protruding fuse.</p> <ul style="list-style-type: none"> • This requirement may be waived if the device remains upright when subjected to a tilt of 12 degrees from the horizontal. • Multiple-tube mine and shell devices which contain at least one launching tube with an inner diameter of 38 millimeters (1.5 inches) or greater shall be stable when placed on a test fixture that holds the device at a 60° angle. This is a static test; the fireworks device is not ignited while at a 60° angle.
Blowout	<ul style="list-style-type: none"> • Blowout is prohibited in consumer fireworks devices.
Burnout	<ul style="list-style-type: none"> • Burnout is prohibited in consumer fireworks devices.
Break Charge	<ul style="list-style-type: none"> • Break charge for consumer fireworks shall be black powder or equivalent non-metallic composition. • It is not considered to be an audible effect when the primary use is to expel and ignite a secondary effect in a consumer fireworks device.
Chemical composition	<ul style="list-style-type: none"> • All consumer fireworks devices shall comply with the “List of Prohibited and Permissible Chemicals” noted in APA 87-1.
Construction	<ul style="list-style-type: none"> • The construction of the fireworks device shall be adequate to prevent leakage of the chemical composition at any time.
Fuse	<ul style="list-style-type: none"> • All fuse utilized other than enclosed fuse shall meet the criteria set forth in this <i>Annex</i>. The fuse used as the lead into the body of the item shall be safety fuse or other fuse that has been protected to resist side ignition. • The fuse burning time from ignition of the tip of the fuse to ignition of the device shall be at least 3 seconds but not more than 9 seconds. Roman Candles are allowed a maximum fuse burn time of not more than 12 seconds. • Exposed fuses (both lead-in and connecting) shall resist side ignition for at least 3 seconds. Certain small items (e.g.: Ground Bloom Flowers and other ground spinners, bottle rockets, firecrackers, and some smoke items) are not required to meet this requirement if thinner fuse is required for the device to function properly. • For multiple-effect or multiple-tube items, the timing between effects (or tubes) shall not exceed 10 seconds. • The ignition fuse shall be securely attached to the item so that it will support either the weight of the item plus 227 grams or double the weight of the item, whichever is less, without separation from the item or other fuse components. The lead fuse on any item containing a projectile with a gross weight exceeding 25 grams shall enter the body of the launch tube through the side, near the base. (NOTE: Mines and Fountains are not considered to contain projectiles.)
Handles	<ul style="list-style-type: none"> • A fireworks device which is intended to be hand-held, and is so labeled, shall incorporate a handle at least 101 mm (4 inches) in length. • Handles shall remain firmly attached during transportation, handling, and normal operation of the device; or they shall consist of an integral section of the device which extends at least 101 mm (4 inches) below the pyrotechnic chamber. • Wire or wood sparklers 253 mm (10 inches) or less in length shall have handles at least 76 mm (3 inches) in length.
Mandatory Product Labeling (not DOT hazard)	<ul style="list-style-type: none"> • Fireworks devices intended for consumer sale and use shall be labeled in conformance with the requirements of the Consumer Product Safety Commission regulations promulgated in 16 CFR §§

class labeling)	1500.14(b)(7) and 1500.121. See Section 2 of this Annex for examples of these requirements.
Name	<ul style="list-style-type: none"> Items subject to this Annex shall not bear a name or bear graphics suggesting a use of the product that is inconsistent with the cautionary labeling instructions.
Non-Food Packaging	<ul style="list-style-type: none"> A finished fireworks device shall not be designed or packaged in such a manner that it could be confused with candy or other food items.
Novelties	<ul style="list-style-type: none"> Devices which are not regulated as explosives and are not considered to be consumer fireworks for transportation purposes; however, these devices shall still comply with all cautionary labeling requirements applicable to consumer fireworks devices.
Reloadable Shells	<ul style="list-style-type: none"> Each shell must include both an orienting loop that is securely attached to the top of the Shell and a Shell wrapper or other means of securely maintaining correct Shell orientation Individual Shells that are of cylindrical or other non-spherical shape must not exceed 101.6mm (4 inches) in total length (Note) These are requirements for AFSL tested devices only. They are not requirements covered under 16 CFR, 49 CFR or in APA 87-1.
Reports	<ul style="list-style-type: none"> Ground Reports are those produced at or near ground level (< 3 meters) and are limited to a maximum of 50 milligrams of chemical composition per each report. Aerial Reports are those produced at a height equal to or greater than (≥) 3 meters and are limited to a maximum of 130 milligrams of chemical composition per each report
Spikes	<ul style="list-style-type: none"> Spikes which constitute an integral part of a pyrotechnic product shall protrude at least 51 millimeters (2 inches) from the base of the device and shall have a blunt tip not less than 3.2 millimeter (1/8 inch) in diameter of 3.2 millimeter (1/8 inch) square. Fireworks devices which are intended to be hand-held and are so labeled shall incorporate a handle at least 4 inches in length. Handles shall remain firmly attached during transportation, handling and full operation of the device, or shall consist of an integral section of the device at least four inches below the pyrotechnic chamber.
Sticks	<ul style="list-style-type: none"> Sticks on sky rockets and other fireworks devices that utilize a stick for guidance shall be firmly attached to the body of the device. Sticks shall be secure enough to remain firmly attached during transportation, handling, and normal operation. Sticks shall be rigid and of such length so as to assure stable flight. (The maximum curvature of such stick(s) may not exceed 25 millimeters (1 inch).)
Tubes	<ul style="list-style-type: none"> Tubes shall be constructed of material that will allow the item to function without burnout or blowout. Tubes shall be securely attached to the base so as not to separate or come loose during transportation, handling, or normal operation
Testing	<ul style="list-style-type: none"> All fireworks devices intended for consumer use in the U.S. shall be tested by a reasonable testing program per the <i>Consumer Product Safety Improvement Act of 2008</i>. Companies who manufacture, import, or distribute consumer fireworks in the United States should be aware of the existence of the CPSC certification requirements. Further information may be found at http://www.cpsc.gov/about/cpsia/sect102.html.

1.2 Specific Product Requirements – See Parts 2 and 3

2. Product Labeling Requirements for Consumer Fireworks

2.1 Scope - This document discusses the labeling requirements of the U.S. Consumer Product Safety Commission for consumer fireworks. The specific label wording contained herein is the minimum cautionary wording required by CPSC. See 16 CFR §1500.14(b)(7).

2.2 – General Requirements for Labeling

Statutory Reference	<ul style="list-style-type: none"> • <i>The Federal Hazardous Substances Act (FHSA)</i> requires only that the cautionary labeling be prominent, conspicuous, and in English. • The regulations promulgated under the FHSA spell out in great detail what the terms prominent and conspicuous mean (See 16, CFR § 1500.121).
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2.3 – Specific Requirements for Labeling from 16 CFR § 1500.14(b)(7)

Label Content	<ul style="list-style-type: none"> • Specific statements of hazard are specified for various classes of fireworks items in 16 CFR § 1500.14(b)(7). • The signal word shall be either <i>WARNING</i> or <i>CAUTION</i>, printed in all capital letters. • The term <i>WARNING</i> shall be used for rockets, mines and shells, roman candles, firecrackers and other items with report. • The term <i>CAUTION</i> shall be used for fountains, sparklers, and other non-aerial, non-report items. • The statement of hazard, printed in all capital letters, describes the principal hazard or hazards associated with a particular device, and should accurately describe what an item does. • For new devices, an appropriate statement of hazard shall be used. • Typical statements of hazard include: <i>FLAMMABLE; EXPLODES; EMITS SHOWER OF SPARKS; and SHOOTS FLAMING BALLS.</i> <ul style="list-style-type: none"> ○ Any device that includes a firecracker or report component shall include <i>WITH REPORT</i> in the statement of hazard. ○ For example, a multiple tube device that shoots stars and firecrackers into the air should state <i>WARNING SHOOTS FLAMING BALLS WITH REPORT.</i>
Instructions	<ul style="list-style-type: none"> • Instructions for proper use shall be printed on each item. • Text for the most common categories of fireworks is specified at 16 CFR § 1500.14(b)(7). • Similar wording shall be created for other categories not specified in the regulations. <ul style="list-style-type: none"> ○ These instructions need not be printed in capital letters. • These instructions may include the following: <ul style="list-style-type: none"> ○ <i>Use Only Under Close Adult Supervision For Outdoor Use Only</i> ▪ <i>Do Not Hold in Hand Light Fuse and Get Away</i> • These other cautions may be printed below the statement of hazard, and may appear elsewhere on the item if a statement which informs the user to carefully read the other cautions is printed directly under the statement of hazard (i.e.: <i>CAUTION EMITS SHOWER OF SPARKS Carefully Read Other Cautions On Back Panel</i>).
Label Placement	<ul style="list-style-type: none"> • The signal word and statement of hazard shall appear on every principal display panel (PDP) of a fireworks item. • PDP is defined as the portion of each item, as well as the portion of each retail package, that bears the labeling designed to be most prominently displayed, shown, presented, or examined under conditions of retail sale. • CPSC has further interpreted this definition to mean that any side or panel that bears the name of the item is a principal display panel and

	<p>requires a warning label.</p> <ul style="list-style-type: none"> • Therefore, a box-type item that has an item name on all four sides shall bear a warning label on each side. • If the name appears on only one panel, only that panel shall bear a warning label. This interpretation also holds for the retail package. <ul style="list-style-type: none"> ○ If the retail package is clear, and a complete warning label is clearly legible through the wrapper, no additional warning label is required on the outside wrapper or package. ○ For cylindrical items, the PDP is interpreted to mean 40percent of the total surface area of the cylinder, centered at the name of the item. If the warning label appears directly beneath the name of the item, there is no question as to compliance. The signal word and statement of hazard shall appear on the PDP, rather than on the back of a cylinder. ○ For unusual-shaped devices, (e.g.: frogs, chickens, vases, etc.) use the side that will be displayed for retail sale as the PDP. • For any device, there are two options with respect to warning label placement: <ul style="list-style-type: none"> ○ Put the entire required label on each PDP. ○ Put the appropriate signal word and statement of hazard on each PDP, together with a statement, “<i>Carefully Read Other Cautions on Side Panel</i>” (or “<i>Back Panel</i>” or “<i>Bottom Panel</i>” if appropriate) and the other cautionary information may then be printed elsewhere, as indicated on the item.
<p>Conspicuousness and Prominence</p>	<ul style="list-style-type: none"> • All cautionary labeling shall appear in legible type, which is a contrasting color to the background, as well as with other printed matter on item. • Color – Print with an ink color that contrasts well with the paper. <ul style="list-style-type: none"> ○ For example, black letters on a dark blue background are not acceptable, whereas black or dark blue type on a white background should always be acceptable. ○ The background of the warning label should be clear and free of any portion of the design, graphics, or other printed matter on the label. • Border – The signal word, statement of hazard, and other cautionary information or the instructions to carefully read the other information elsewhere on the item shall: <ul style="list-style-type: none"> ○ Be placed together within a square or rectangular area (with or without a border) on each PDP of each item and each retail package. ○ The caution label shall be clearly separate from all other wording printed on the item. • Horizontal Placement – The warning label shall be printed in lines parallel to the base of the item. (“Base” refers to the base on which the item rests when it is displayed for retail sale.) <ul style="list-style-type: none"> ▪ On panels other than the PDP, other cautionary information may appear in lines parallel to other printing on the panel, rather than parallel to the base. ▪ This parallel requirement does not apply to narrow-diameter cylinders, where the printing may run lengthwise on the cylinder.
<p>Type Size Requirements</p>	<ul style="list-style-type: none"> • The proper, minimum type size to use for a warning label depends on the area of the PDP of the item, and shall be calculated for each item. • For square or rectangular items, the entire side or panel that bears the name of the item is the PDP. <ul style="list-style-type: none"> ○ To calculate the PDP area, multiply the length of the base times the height of the item. • For triangular, hexagonal, or other geometric figures with rectangular panels, select the panel (or each panel) that bears the name of the item. <ul style="list-style-type: none"> ○ Multiply the length of the side bearing the item name times the height of the item to determine the PDP areas. • For cylindrical items the PDP area is calculated by:

	<ul style="list-style-type: none"> ○ PDP Area of Cylinder = Height x Diameter x 1.26 ● For irregularly shaped items, you shall use your best judgment to determine the PDP area. 																																
Minimum Type Size	<ul style="list-style-type: none"> ● Once you have calculated the area of the PDP, use the table below to determine the minimum type size for the warning label. <table border="1" style="margin-left: 40px;"> <thead> <tr> <th colspan="4">● MINIMUM TYPE Size (in inches)</th> </tr> <tr> <th>● Area of PDP (sq. inches)</th> <th>● Signal Word</th> <th>● Statement of Hazard</th> <th>● Other Cautions</th> </tr> </thead> <tbody> <tr> <td>● 0-2</td> <td>● 3/64</td> <td>● 3/64</td> <td>● 2/64</td> </tr> <tr> <td>● >2-5</td> <td>● 4/64</td> <td>● 3/64</td> <td>● 3/64</td> </tr> <tr> <td>● >5-10</td> <td>● 6/64</td> <td>● 4/64</td> <td>● 4/64</td> </tr> <tr> <td>● >10-15</td> <td>● 7/64</td> <td>● 6/64</td> <td>● 4/64</td> </tr> <tr> <td>● >15-30</td> <td>● 8/64</td> <td>● 6/64</td> <td>● 5/64</td> </tr> <tr> <td>● >30</td> <td>● 10/64</td> <td>● 7/64</td> <td>● 6/64</td> </tr> </tbody> </table> ● It is permissible and advisable whenever possible to use a type size larger than the minimum. ● This might provide a safety factor should the printed type fall a little short of your specifications. 	● MINIMUM TYPE Size (in inches)				● Area of PDP (sq. inches)	● Signal Word	● Statement of Hazard	● Other Cautions	● 0-2	● 3/64	● 3/64	● 2/64	● >2-5	● 4/64	● 3/64	● 3/64	● >5-10	● 6/64	● 4/64	● 4/64	● >10-15	● 7/64	● 6/64	● 4/64	● >15-30	● 8/64	● 6/64	● 5/64	● >30	● 10/64	● 7/64	● 6/64
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● >15-30	● 8/64	● 6/64	● 5/64																														
● >30	● 10/64	● 7/64	● 6/64																														
Very Small Devices	<ul style="list-style-type: none"> ● In cases where individual items are too small to accommodate the required cautions: <ul style="list-style-type: none"> ○ The required labeling may appear on the retail package in complying type size and placement, rather than on each item, ○ Provided that the entire, unbroken package is sold to the retail customer as a unit. ● Whenever possible, individual items should bear at least the signal word and statement of hazard, with “Carefully Read Instructions on Package” also printed on each item. ● The manufacturer or importer should obtain prior approval from CPSC for any item that does not bear full labeling on each device. 																																
Fireworks Assortments	<ul style="list-style-type: none"> ● Pre-packaged fireworks assortments shall bear on each PDP of the box or wrapper the following statement in complying type size: ● <i>WARNING: This assortment contains items that may be hazardous if misused and should only be used under adult supervision.</i> ● <i>IMPORTANT: Read cautions on individual items carefully.</i> 																																

2.4 – Specific Requirements for Labeling from 16 CFR § 1500.14(b)(7)

Labels for Specific Items	<ul style="list-style-type: none"> ● The specific label wording contained herein is the minimum cautionary wording required by CPSC. ● The American Fireworks Standards Laboratory (AFSL) has established additional, voluntary labeling requirements for many categories of consumer fireworks. (See www.afsl.org)
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Firecracker

WARNING
EXPLOSIVE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
DO NOT HOLD IN HAND
LAY ON GROUND
LIGHT FUSE AND GET AWAY

Base Fountain (cylindrical or cone type)

CAUTION
EMITS SHOWERS OF SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON LEVEL SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Handle Fountain

CAUTION
EMITS SHOWERS OF SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
HOLD IN HAND – POINT AWAY FROM BODY
LIGHT FUSE

California Candle

CAUTION
EMITS SHOWERS OF SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
HOLD IN HAND AT BOTTOM OF TUBE
POINT AWAY FROM BODY SO THAT NEITHER
END POINTS TOWARD BODY

Spike Fountain

CAUTION
EMITS SHOWERS OF SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
STICK FIRMLY IN GROUND IN AN UPRIGHT
POSITION
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Ground Spinner (without report)

CAUTION
SPINS ON GROUND
EMITS FLAMES AND SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Helicopter (no report)

WARNING
EMITS SHOWERS OF SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, OPEN SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Helicopter (with report)

WARNING
EMITS SHOWERS OF SPARKS
AND REPORT
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, OPEN SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Illuminating Torch With Handle

CAUTION
EMITS SHOWERS OF SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
HOLD IN HAND – POINT AWAY FROM BODY,
CLOTHING, OR OTHER FLAMMABLE MATERIAL
LIGHT FUSE

Missile-Type Rocket (no report)

WARNING
FLAMMABLE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, OPEN SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Missile-Type Rocket (with report)

WARNING
FLAMMABLE WITH REPORT
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, OPEN SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Rocket with Stick (no report)

WARNING
FLAMMABLE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE IN WOODEN TROUGH OR IRON PIPE
AT 75° ANGLE, POINTING AWAY FROM
PEOPLE OR FLAMMABLE MATERIAL
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Rocket with Stick (with report)

WARNING
FLAMMABLE WITH REPORT
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE IN WOODEN TROUGH OR IRON PIPE AT
75° ANGLE, POINTING AWAY FROM PEOPLE
OR FLAMMABLE MATERIAL
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Chaser (with report)

WARNING
FLAMMABLE
EXPLODES
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, OPEN SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Sparkler (Wooden Stick)

CAUTION
FLAMMABLE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
DO NOT TOUCH HOT WOOD
HOLD IN HAND WITH ARM EXTENDED AWAY
FROM BODY
KEEP BURNING END OR SPARK AWAY FROM
WEARING APPAREL OR OTHER FLAMMABLE
MATERIAL

Sparkler (Wire Stick)

CAUTION
FLAMMABLE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
DO NOT TOUCH GLOWING WIRE
HOLD IN HAND WITH ARM EXTENDED AWAY
FROM BODY
KEEP BURNING END OR SPARKS AWAY FROM
WEARING APPAREL OR OTHER FLAMMABLE
MATERIAL

Toy Smoke Device

CAUTION
FLAMMABLE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON GROUND
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Snakes

CAUTION
FLAMMABLE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
DO NOT PUT IN MOUTH
LAY ON GROUND
LIGHT PELLET

Snappers

CAUTION
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
DO NOT PUT IN MOUTH
THROW ON GROUND

Party Popper (bottle type)

CAUTION
FLAMMABLE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
DO NOT POINT EITHER END TOWARD FACE
OR OTHER PERSON
HOLD IN HAND, JERK STRING

Booby Trap (pulling fireworks)

CAUTION
FLAMMABLE
EXPLODES WHEN STRINGS ARE PULLED
USE ONLY UNDER CLOSE ADULT
SUPERVISION
DO NOT HOLD CLOSE TO FACE
HOLD IN HAND, JERK ENDS OF STRING

Party Popper (pistol type)

CAUTION
FLAMMABLE
USE ONLY UNDER CLOSE ADULT
SUPERVISION
DO NOT POINT EITHER END TOWARD FACE
OR OTHER PERSON
HOLD IN HANDS, PULL TRIGGER SHARPLY

Mine or Shell With Integral Mortar**
(single or multiple shot without report)

WARNING
SHOOTS FLAMING BALLS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, SMOOTH SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Mine or Shell**
(single or multiple shot with report)

WARNING
SHOOTS FLAMING BALLS AND REPORTS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, SMOOTH SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

** Additional labeling may be required for certain multiple shot mines and shells for Approval under AFSL Standards.

Aerial Shell With Separate Mortar Tube (no report)

WARNING
SHOOTS FLAMING BALLS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE CARDBOARD LAUNCHER UPRIGHT ON
LEVEL GROUND
UNWRAP LONG FUSE ON BALL, INSERT BALL
INTO TUBE WITH FLAT END DOWN AND WITH
FUSE EXTENDING OUT OF TUBE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Aerial Shell With Separate Mortar Tube
(with report)

WARNING
SHOOTS FLAMING BALLS AND REPORTS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE CARDBOARD LAUNCHER UPRIGHT ON
LEVEL GROUND
UNWRAP LONG FUSE ON BAL.
INSERT BALL INTO TUBE WITH FLAT END
DOWN AND WITH FUSE EXTENDING OUT OF
TUBE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Roman Candle (no report)

WARNING
SHOOTS FLAMING BALLS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
STICK BUTT END IN GROUND
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Roman Candle (with report)

WARNING
SHOOTS FLAMING BALLS AND REPORTS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
STICK BUTT END IN GROUND
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Roman Candle With Spike (no report)

WARNING
SHOOTS FLAMING BALLS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
STICK FIRMLY IN GROUND IN AN UPRIGHT
POSITION
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Wheel (axle type)

CAUTION
EMIT SHOWERS OF SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
ATTACH SECURELY BY MEANS OF A NAIL
THROUGH THE HOLE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Wheel (string type)

CAUTION
EMITS SHOWERS OF SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
ATTACH STRING TO OBJECT SO THAT ITEM
HANGS FREELY
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

NOVELTIES Each will be different, check with APA or CPSC for advice.

Tank-Type Item (no report, no ejected stars)

CAUTION
MOVES ON GROUND
EMITS FLAME AND SPARKS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, LEVEL SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Tank-Type Item (with stars and reports)

WARNING
MOVES ON GROUND, SHOOTS
FLAMING PELLETS AND REPORTS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, LEVEL SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Aircraft Carrier-Type Item
(item or components rise into air)

CAUTION
EMITS SHOWERS OF SPARKS
SHOOTS UPWARD
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE BOAT ON WATER
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

Stationary Ground Item (stars are propelled,
short distance)

CAUTION
FLAMMABLE
EMITS FLAMING PELLETS
USE ONLY UNDER CLOSE ADULT
SUPERVISION
FOR OUTDOOR USE ONLY
PLACE ON HARD, LEVEL SURFACE
DO NOT HOLD IN HAND
LIGHT FUSE AND GET AWAY

2.5 - Modification to the existing cautionary labeling for all reloadable tube aerial shell devices
This is a requirement for AFSL tested devices only. It is not a requirement covered under 16 CFR, 49 CFR, or in APA 87-1.



2.5.1 - For purposes of determining the correct placement, prominence and conspicuousness of the warning label, AFSL provides the following guidance:

1. The entire top (mouth) surface areas of the tube must be treated as the principal display panel for purposes of determining the appropriate type size. AFSL requests that the label be designed so that it is fully readable from the top of the tube without having to turn the tube in any other orientation to read any part of the label.
2. The “danger” triangle should be printed in yellow with a black border, consistent with the international symbol for “danger”, which it represents. The height of the triangle must be a minimum of 16/64” and must be an equilateral triangle.
3. The Signal word “Danger” must be printed in a type size of 8/64”.
4. The remainder of the wording must be printed in a type size of 4/64”.
5. The background of the label must be white and the wording of the labeling (except for the yellow triangle), must be in bold, black or other similarly dark type.
6. The warning label must not include any other artwork, graphics, logos or other designs so as not to detract from the message being presented.
7. The warning label must be printed on an adhesive label that can be securely attached over the mouth of the launcher tube and that must be removed by the consumer before inserting a shell into the tube.

3. Consumer fireworks testing

3.1 Scope - This document utilizes test procedures for the requirements of the U.S. Consumer Product Safety Commission (CPSC) for consumer fireworks and should be used for lot acceptance testing in conjunction with the Consumer Fireworks Testing Manual, Fourth Edition (17 August 2006). This Test Manual may be found at www.cpsc.gov/BUSINFO/testfireworks.pdf.

3.2 – Testing equipment and general requirements.

<p>General Requirements</p>	<ul style="list-style-type: none"> • This testing program is designed to enable manufacturers, importers and distributors to determine whether or not consumer fireworks are in compliance with APA Standard 87-1A and the consumer fireworks requirements noted in Title 16 CFR § 1507. • As a general guideline, 15 randomly selected samples of each item should be tested for each requirement. • If all 15 pass, the item is acceptable. • If 1 or more of the 15 fail a requirement, test an additional 10 items. • If 2 of those fail, distribution should be withheld pending a thorough analysis of the problem.
<p>Testing Subjectivity</p>	<ul style="list-style-type: none"> • There is some subjectivity in these tests and therefore judgments shall sometimes be made. • For example, if even 1 cone fountain (out of the group of 10) were to explode, additional samples should be tested.
<p>Equipment Needed</p>	<ul style="list-style-type: none"> • Stopwatch, razor blade, cigarette, matches, ruler, tilt board, pen or pencil, and fireworks test sheet. • Safety glasses shall be worn by personnel conducting these tests. For items containing reports, a scale capable of measuring to 0.001 g (1 mg) is required as well.
<p>Combined Testing</p>	<ul style="list-style-type: none"> • Many of these tests can be done in conjunction with other tests, such as the burnout/blowout test, fuse ignition/burn time tests, and the functional test. • This will minimize the number of tests and time required to complete the required testing.

3.3 Specific Test Criterion

<p>Fuse, Resistance to Side Ignition</p>	<ul style="list-style-type: none"> • Leave intact any tape or paper wrapping used to cover the fuse. • Use a razor blade to separate the fuse from the item at the point where the fuse enters the device, and carry out the test on the detached fuse. • Place the side of the fuse on the glowing tip of a lit cigarette, and use a stopwatch to measure the time required for ignition of the fuse through the side to take place. • The fuse should resist side ignition for at least 3 seconds. • Note: Certain small items requiring a restricted orifice, such as ground bloom flowers and other ground spinners, bottle rockets, and small smoke items, need not meet this requirement if a thinner fuse is required for proper functioning. However, all other types of fuse shall still meet the 3-9 second fuse burning time.
<p>Fuse Burning Time</p>	<ul style="list-style-type: none"> • Using a stopwatch, ignite the tip of the fuse and measure the time delay from lighting the fuse until the item begins to function. • The fuse burning time should be at least 3 but not more than 9 seconds. • Roman candles may require a greater length of time to safely function and may burn for up to 12 seconds before igniting the item. • This measurement records the time of the burning of the fuse from the initial ignition (when the fuse sputters and supports combustion) to the time the device starts to function. The time at which a device begins to function does not necessarily coincide with the increased production of smoke from a device, or the first spark from a device. The fireworks device "begins to function" when it becomes obvious that combustion of pyrotechnic materials (excluding internal fuses) has begun, that is, the device starts to produce readily visible effects such as the firing of flaming balls or shells, the discharge of a shower of sparks, effects or sound effects. • Fireworks devices, other than firecrackers, that require a fuse shall use a fuse that has been treated or coated in such manner as to reduce the

	<p>possibility of side ignition. The following test must be conducted to evaluate whether a fuse has been treated or coated in such manner as to reduce the possibility of side ignition:</p> <ul style="list-style-type: none"> (i) Cut the fuse at the point where the fuse enters the fireworks device. If the fuse is wrapped in paper, plastic, or taped to the device, remove the fuse with the paper, plastic, and/or tape intact; and (ii) Place the glowing tip of a lit standard NIST (SRM 1196) cigarette directly on the side of the fuse (or the paper, plastic, or tape attached to the fuse) and time, in seconds, how long it takes for the fuse to ignite. <ul style="list-style-type: none"> • The fuse must not ignite within 3 seconds. • The following devices are exempted from § 1507.3(a)(1) and (2): <ul style="list-style-type: none"> (i) Devices such as ground spinners that require a restricted orifice for proper thrust and contain less than 6 grams of pyrotechnic composition. (ii) Devices with fuses that protrude less than ½ inch from the device, because the end of the fuse may ignite during testing.
Fuse Attachment	<ul style="list-style-type: none"> • For items weighing less than 227 grams, tape, or otherwise attach, another identical item to the one being tested, and hold the item by the fuse. • Separation of the fuse from the item constitutes a failure. • For items weighing more than 227 grams, the fuse shall support the weight of the item plus 227 grams (i.e.: fishing weights work well for this test).
Item Stability	<ul style="list-style-type: none"> • Measure the vertical height of the item from the bottom of the base to the top of the device, including any fuse or paper twist protruding from the top of the item. • Also measure the maximum horizontal dimension of the base (or diameter if the base is round.) • If the base is at least ⅓ of the height, no further test is needed. If the base is less than ⅓ of the height, conduct a tilt test. • To conduct this test, place the item on a sandpaper covered surface that is tilted 12° from horizontal. • The item should not tip over. • An item that fails both the base-to-height ratio and the 12° tilt test is not in compliance with the <i>Standard</i>. • Multiple tube mine and shell devices with individual tubes that have an inner diameter measuring 3.8 centimeters (1.5 inches) or greater shall be tested for stability at a tilt angle of 60°. • This test is performed on the item <i>without</i> igniting the fuse.
Pyrotechnic Leakage	<ul style="list-style-type: none"> • Shake the item over a clean, white piece of paper to see if powder or granules are released. • No leakage may occur, nor should leakage or loose composition occur in assortment carton, shipping carton, or within multiple tube items
Burnout and Blowout	<ul style="list-style-type: none"> • Ignite a randomly selected sample of 15 items and note the performance. • The entire pyrotechnic effect shall come out of the intended orifice. • Any burning through the bottom or side of an item, or any unintended rupturing of the casing of an item (that functions other than by exploding) due to excessive gas pressure constitutes a failure
Handles, Length	<ul style="list-style-type: none"> • Remove and measure the length of any wooden handles used on items. • For handles made of paper tubes, insert a dowel or pencil into the bottom of the tube until it reaches the clay plug next to the pyrotechnic composition.

	<ul style="list-style-type: none"> • Measure the length of the paper or dowel that went inside of the tube. • The handle shall be at least 101 millimeters (4 inches) in length.
Handles, Attachment	<ul style="list-style-type: none"> • Pull or twist on the handle to ensure that there is no separation of the handle from the item. • The handle shall remain firmly attached.
Spikes	<ul style="list-style-type: none"> • For items designed to be held upright in the ground by means of a spike, measure the length of the spike protruding from the base or bottom. • This shall be at least 51 millimeters (2 inches) in length. • In addition, the device shall have a blunt tip not less than 2.03 centimeters (1/8 inch) in diameter or 2.03 centimeters (1/8 inch) square. • Check for secure attachment of the Spike to the device by applying a reasonable twisting force at the attachment joint.
Wheels	<ul style="list-style-type: none"> • Check each driver on the wheel and axle for secure attachment. • To test for driver attachment, attach an eight-ounce weight to the driver (using string or a small clip tied to the weight), and let the weight hang down. • In a like manner, attach an eight-ounce weight to the axle. Test a minimum of 8 test devices. • Then ignite at least 15 of the test devices to ensure that there is no separation of the drivers or of any other part of the device the operation of the devices.
Smoke, Operation	<ul style="list-style-type: none"> • Ignite at least 15 samples of each smoke device. • The item may not break, nor may it produce an external flame for longer than 1/4 of the time the device functions.
Smoke, Design	<ul style="list-style-type: none"> • If the item contains any plastic, dissect the device to make certain there is no contact between the smoke composition and the plastic parts. • Smoke devices may not resemble, in both color and configuration, banned explosive devices such as M-80 salutes, silver salutes, or cherry bombs
Rockets, Sticks	<ul style="list-style-type: none"> • At least 15 samples of each rocket type should be examined to make certain that the sticks are attached firmly to the body of the device. • Also examine the sticks to make certain that they are rigid and straight. • To test for straightness, lay the sticks on a flat surface with the maximum bow up. • The maximum deviation from the horizontal shall not exceed 2.54 centimeters (1 inch). • To test for rigidity, clamp a 2.54 centimeters (1 inch) section at the end of the rocket stick farthest from the motor tube horizontally to a rigid surface. • Measure the distance the motor end of the rocket arches downward. • The maximum downward arch may not exceed 1/4 of the total length of the rocket. • To check the stick/driver attachment, lift the rocket device by grasping the end of the stick. • If the sample device weighs less than 227 grams, hold it vertically with the driver pointed downward; fasten two of the sample devices together and attach these two devices to the sample rocket driver/motor. • Any separation noted between the stick and driver constitutes failure of the test. • If the sample device weighs more than 227 grams, hold it vertically with the driver pointed downward; attach a 227 gram weight to the rocket driver/motor. • Any separation noted between the stick and driver constitutes failure of the test
Rockets,	<ul style="list-style-type: none"> • At least 15 samples of each item should be ignited.

Functional	<ul style="list-style-type: none"> Any malfunction, unexpected or otherwise questionable performance should be noted in the “Comments” section of the Test Sheet, and distribution of the item should be withheld pending a thorough analysis of the problem. If the item contains a report, it will be necessary to locate the report component and weigh the quantity of report powder. An aerial report is limited to 130 mg
Reloadable Tube Aerial Shell Diameter Test	<ul style="list-style-type: none"> The maximum outside diameter of Reloadable Tube Aerial Shell fireworks devices is 4.45 centimeters (1.75 inches). This test involves measuring the diameter of a reloadable tube aerial shell. Using the 15.24 centimeter (6-inch) metal caliper, place the exterior measurement jaws around the largest portion of the shell’s exterior. Adjust the caliper and determine the outside diameter of the shell. When the shell is a multiple break shell, measure the largest diameter sphere (ball) only. Measurements exceeding 4.45 centimeters (1.75 inches) constitutes a failure
Firecrackers and Aerial Reports	<ul style="list-style-type: none"> Firecrackers are allowed no more than a 50 milligrams charge of pyrotechnic composition. Reports in aerial devices that rise into the air more than 3.05 meters (10 feet) are allowed no more than a 130 milligrams of chemical composition
	<ul style="list-style-type: none"> Firecrackers: The charge of chemical composition in firecrackers is often “flash powder”, which is gray in color. However, some firecrackers contain a pyrotechnic composition powder that is not gray. Carefully dissect one firecracker from each of five sub-samples. After the powder from 5 firecrackers has been weighed, calculate the average weight. If the average weight is 50 milligrams or less the analysis is complete.
	<ul style="list-style-type: none"> Aerial Reports (Paper Firecracker Type): Aerial reports may be a collection of one or more firecrackers inside an aerial shell or rocket. The report powder in aerial reports is generally gray as with firecrackers. At times, however, black, pink, or white powder has been observed as the report charge. Carefully dissect the device and remove the report(s). If the aerial reports are similar to firecrackers, dissect the aerial report in a manner similar to that used with firecrackers. After the powder from 5 aerial reports has been weighed, calculate the average weight. If the average weight is 130 milligrams or less the analysis is complete
	<ul style="list-style-type: none"> Aerial Reports (Paper Firecracker Type with Different Sizes): Some firework devices contain aerial reports of two or more physical sizes. All sizes of reports need to be weighed as if they were from different devices. For example, a device may contain large and small aerial reports. Weigh the powder from five of the larger reports and five of the small reports. If the average of 5 aerial reports is less than 130 milligrams for either size, the analysis is complete for that particular size.
	<ul style="list-style-type: none"> Aerial Reports (Plastic Projectile or Bottle Rocket): If the aerial report is not a paper firecracker type, but a pyrotechnic

	<p>composition in the device that is separated by layers of clay or some other material, carefully dissect the aerial effects casing and remove the report charge.</p> <ul style="list-style-type: none">• If the average of 5 aerial reports is less than 130 milligrams the analysis is complete.
	<ul style="list-style-type: none">• Aerial Reports (Aerial Shell is the Report Casing):• Open the paper shells by cutting through the wrapping. Cylindrical shells should be cut longitudinally and spherical shells should be cut along the center seam of the shell. Remove the component layers until the report charge is removed.• The report charge is then screened through a 100-mesh sieve. No instruments should be used to stir or mix the ingredients.• If stars are present in the shell, such actions may fragment the stars.• The weight of the report composition shall be 130 milligrams. or less
Labeling	<ul style="list-style-type: none">• Examine the labeling on each item and on all retail packages to make certain that the labeling is conspicuous and in conformance with the requirements of the Consumer Product Safety Commission as noted in <i>16 CFR § 1500.14(b)(7) and 1500.121.</i>• Examples of labeling for consumer fireworks devices may be found at <i>Section II</i> of this <i>Appendix</i>