



APA STANDARD 87-1C FIREWORKS BROCHURE

A Guide to Understanding APA Standard 87-1C



U.S. Department
of Transportation

Pipeline and
Hazardous Materials
Safety Administration

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EXECUTIVE SUMMARY

The Office of Hazardous Materials Safety (OHMS) within the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the United States Department of Transportation (DOT) is responsible for approving the classification of explosives, in accordance with the Hazardous Materials Regulations (HMR; 49 CFR parts 171-180).

This brochure details the process required to apply for a “UN0431, Articles, pyrotechnic for technical purposes, Division 1.4G” or “UN0336, Fireworks, 1.4G” EX Classification Approval (EX Number) through PHMSA. 49 CFR § 173.64, as well as the requirements found in the 2018 American Pyrotechnics Association (APA) Standard 87-1C “Standard for the Construction, Classification, Approval, and Transportation of Entertainment Industry and Technical (EI&T) Pyrotechnics” (2018 APA Standard 87-1C), which is incorporated by reference (IBR) in 49 CFR § 171.7(f), set forth the regulations and the requirements to apply for an approval, and also provides shipping requirements for the safe transportation of hazardous materials.

The regulatory requirements for applying for explosive approvals can be found in:

- 49 CFR § 107.705—Registrations, reports, and applications for approval
- 49 CFR § 173.56—New explosives—definition and procedures for classification and approval
- 49 CFR § 173.64—Exceptions for Division 1.3 and 1.4 fireworks

Each firework application submitted by the manufacturer should comply with the requirements set forth in the HMR and 2018 APA Standard 87-1C (49 CFR § 173.64). Only EI&T Pyrotechnics that comply with the 2018 APA Standard 87-1C may be approved by PHMSA.

The contents of this guide do not have the force and effect of law and are not meant to bind the public in any way, and the guide is intended only to provide information to the public regarding existing requirements under the Hazardous Materials Regulations. Compliance with the requirements of the HMR and 2018 APA Standard 87 1C is the responsibility of the reader.

2018 APA STANDARD 87-1C

Applications for “UN0431, Articles, pyrotechnic for technical purposes, Division 1.4G” or “UN0336, Fireworks, 1.4G” complying with the requirements of the 2018 APA Standard 87-1C and 49 CFR § 173.64 may be approved by PHMSA.

EI&T PYROTECHNICS – DEFINITIONS AND GENERAL REQUIREMENTS

Part 2 of the 2018 APA Standard 87-1C provides definitions and general requirements for “UN0431” or “UN0336.”

DEFINITIONS

Examples of common terms related to “UN0431” or “UN0336” as found in the 2018 APA Standard 87-1C include, but are not limited to, the following:

- **Entertainment Industry and Technical (EI&T) Pyrotechnic Device** – A device containing compositions, which produce a visual and or audible effect primarily used in the entertainment (visual arts) and technical training/development industries. It also complies with the limits and requirements of the 2018 APA Standard 87-1C standard, intended only for professional use, and may not be offered for sale to the general public.
- **Driver** – An EI&T pyrotechnic component (tube) that contains a propellant charge.
- **EX Number** – An explosive classification approval number preceded by the prefix “EX” assigned by PHMSA’s Associate Administrator for Hazardous Materials Safety to a device that has been reviewed and classed under the provisions of 49 CFR §§ 173.56 or 173.64.
- **Manufacturer of EI&T Pyrotechnic device** – An entity that produces the EI&T pyrotechnic device.



GENERAL REQUIREMENTS

Examples of the general requirements for “UN0431” or “UN0336” found in the 2018 APA Standard 87-1C include, but are not limited to, the following:

- **Combination:** Must contain more than one device fused together to form a new device (other than just tube devices):
 - ◊ Must contain items marked “yes” on line 82 of the requirement tables (49 CFR § 173.64(a)(1)).
 - ◊ Must comply with the individual device requirement tables for specific weight limits, chemical restrictions and special conditions (49 CFR § 173.64(a)(1)).
 - ◊ Must be fused and assembled together to form one device (sequential fusing not required) (49 CFR § 173.64(a)(1)).
- **Finished EI&T Pyrotechnic device:** An EI&T pyrotechnic device is one that, in accordance with the 2018 APA Standard 87-1C:
 - ◊ Meets the general requirements for that specific device.
 - ◊ Meets all the requirements in the requirement tables in Part 3 of 2018 APA Standard 87-1C.

- ◊ Passes the Thermal Stability Test in Part 4 of 2018 APA Standard 87-1C.
- ◊ Has no loose chemical composition in the packaging.
- ◊ Marked with the EX Number on the device or packaging if the device is too small.
- ◊ Any device manufactured prior to October 1, 2018, is not required to be marked with the EX Number.
- ◊ A device label may be placed on the device or electric igniter wire or on the smallest inner packaging containing the device.

SPECIFIC REQUIREMENTS FOR EI&T PYROTECHNICS

Part 3 of the 2018 APA Standard 87-1C provides the specific requirements for EI&T Pyrotechnics.

EI&T PYROTECHNICS

EI&T Pyrotechnics in the 2018 APA Standard 87-1C requiring approval by PHMSA, include the following devices and their corresponding section.

Device	Refer to 2018 APA Standard 87-1C Part 3 Section 3.2
EI&T Pyrotechnic Devices	3.2.1
Airburst Colored	3.2.1.1
Airburst Inert Material	3.2.1.2
Airburst Report	3.2.1.3
Binary Flash Powder (Binary Flash, Report Kit)	3.2.1.4
Binary Powder Kit	3.2.1.5
Cannon Simulator	3.2.1.6
Comet Crosse (Split Comet)	3.2.1.7
Flame Projector (Flame Mortar, Flame Column, Flame Ball)	3.2.1.8
Flare (Torch, Lance)	3.2.1.9
Flash Tray/Flash Curtain/Split Mine	3.2.1.10
Flash Tube/Flash Pot	3.2.1.11



Fountain (Cascade, Falls, Gerb)	3.2.1.12
Fountain Nitrocellulose	3.2.1.13
Line Rocket	3.2.1.14
Mine	3.2.1.15
Mine Inert Material (Streamer Mine, Confetti Mine)	3.2.1.16
Mortar Hit Mine (Fireball Effect)	3.2.1.17
Multi-Shot (Cake)	3.2.1.18
Multi-Shot (Combination)	3.2.1.19
Saxon	3.2.1.20
Shell	3.2.1.21
Shot Tube Preloaded	3.2.1.22
Smoke (Cartridge, Gerb, Flare)	3.2.1.23
Spark Effect Devices (Bullet Hits, Spark Producing Devices (SPD)	3.2.1.24
Wheel	3.2.1.25

Note: For devices not listed in the 2018 APA Standard 87-1C, refer to § 173.56

THERMAL STABILITY TEST REQUIREMENTS

Part 4 of the 2018 APA Standard 87-1C describes the thermal stability test requirements applicable to all devices offered for transportation. The device must be thermally stable and in compliance with 49 CFR § 173.64.

SPECIAL PROVISIONS FOR TRANSPORTATION

Part 5 of the 2018 APA Standard 87-1C includes:

- “Special Provisions for Transportation”
 1. “Misfired Fireworks and Pyrotechnic Devices”
 2. “Assembled Devices and Set Pieces”
 3. “Transportation of Fireworks with Fuses (highway flares) and Electric Igniters”

EX APPROVAL APPLICATION

In accordance with 49 CFR § 173.64(a)(3) the process to apply for an EX Approval requires the manufacturer to apply in writing to the Associate Administrator for Hazardous Materials Safety following the applicable requirements in the 2018 APA Standard 87-1C. The manufacturer is then

notified in writing by the Associate Administrator that the fireworks have been classed, approved, and assigned an EX number. Each application must be complete and include all relevant background data and copies of all applicable drawings, test results, and any other pertinent information on each device for which approval is being requested (49 CFR § 173.64(a)(3)). The manufacturer must sign the application and certify that the device for which the approval is requested conforms to the 2018 APA Standard 87-1C (49 CFR § 173.64(a)(3)). Lastly, ensure that no duplicate applications have been submitted.

PHMSA requests that firework EX Approval applications be submitted in English, and the applicant provide consistent information throughout the required application documents. PHMSA considers a completed application submitted for approval, to minimally contain the following in accordance with 49 CFR § 173.64:

- Application Request.
- Device Diagram.
- Chemical Composition Sheet.
- U.S. Designated Agent letter in accordance with §§ 107.705(a)(5) and 105.40 (for foreign based applicants).

If an application is denied, the manufacturer will be notified in writing of the reasons for the denial in accordance with 49 CFR § 107.709. The Associate Administrator may require the fireworks be examined by an agency listed in 49 CFR § 173.56.

NOTE: Please refer to the 2018 APA Standard 87-1C for guidance and a sample EX Application.

APPLYING FOR AN EX APPROVAL (EX NUMBER)

PHMSA created an online application system (Portal) found at <https://portal.phmsa.dot.gov> allowing the applicant to submit EX Approval applications with expedited processing times and immediate confirmation of receipt upon completion of an application.

All applicants requesting an EX Approval are encouraged to use the Portal system. However, PHMSA continues to permit applicants to submit applications using e-mail, parcel/postal mail, or FAX.

****Do not submit duplicate applications (i.e., on-line applications, postal or parcel mail, e-mail and/or FAX), as this will only slow down processing.****

E-mail: fireworks@dot.gov

Mail: U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
Associate Administrator for Hazardous Materials Safety
ATTN: Office of Hazardous Materials Safety
Sciences and Engineering Division
Energetic Materials Branch (PHH-24)
1200 New Jersey Avenue, SE
East Building, 2nd Floor
Washington, DC 20590-0001

Fax: (202) 366-5713

COMPLIANCE AND SAFE TRANSPORTATION OF HAZARDOUS MATERIALS

Compliance with the terms of an approval from PHMSA is the responsibility of the person or company authorized to perform the specific function(s). An EX Approval may be suspended or terminated if the performance of the holder fails to meet required conditions in accordance with 49 CFR § 107.713.

To ensure that approvals are used safely and in accordance with the required terms and conditions, and that companies continue to be fit to conduct authorized operations, enforcement and safety investigators from various Federal agencies, including DOT, routinely conduct compliance and safety inspections.

Persons found to be in violation of the HMR may be subject to civil penalties, criminal penalties, and imprisonment. Maximum penalties depend on several factors, including the nature and circumstances, extent and gravity, and severity of the consequences of the violation. Civil penalties are set out in 49 U.S.C. § 5123, but the actual maximum civil penalties are updated annually due to inflation in accordance with the Federal Civil Penalties Inflation Adjustment Act of 1990 and the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015. Criminal violations of hazardous materials regulations can result in sentences of up to 10 years imprisonment and additional fines as specified in 49 U.S.C. § 5124.

FREQUENTLY ASKED QUESTIONS

Q: Where can I find information on applying for a fireworks EX approval?

A: Information regarding fireworks, the approval process for an EX approval application, a sample application, and additional information can be found at the following link:

[2018 APA Standards 87-1 and Permitted and Restricted Chemicals List - A/B/C | PHMSA \(dot.gov\).](#)

Q: Can I apply for an approval online?

A: Yes, the applicant can apply via the PHMSA Portal, found at <https://portal.phmsa.dot.gov>

Q: How will I know if my application has been received?

A: Once a completed application is submitted, the applicant will receive an email with a ten (10) digit tracking number for the specific application.



Q: How can I check the status of my application?

A: Completed applications may be tracked using the provided tracking number within the Approvals Search database at the following link:

<https://www.phmsa.dot.gov/approvals-and-permits/hazmat/approvals-search>.

Q: What additional information does a foreign applicant provide when requesting an approval?

A: Foreign applicants must provide a designation letter for its U.S. Designated Agent for Service with each application in accordance with 49 CFR §§ 105.40 and 107.705(a)(5).

Q: Can the thermal stability test be conducted and dated the same date as the application?

A: The Thermal Stability Test must be completed prior to the manufacturer certifying its application.

Q: Are tracking numbers different from EX Numbers?

A: Yes, the tracking number is an internally assigned number for use within PHMSA. It does not authorize transportation and should not be placed on packaging or shipping papers.

Q: How does a manufacturer mark EX Numbers on the device, or the packaging if the device is too small?

A: Please refer to the general requirements for a finished display firework device in section 2.4 of the 2018 APA Standard 87-1B.

Q: Are EX Numbers required to be on the package and/or shipping papers?

A: Yes, See 49 CFR § 172.320 for clarification.

Q: How long does an EX Approval application typically take to process?

A: Review of an application may take up to 120 days. Applicants applying through the online PHMSA Portal may see their applications processed more quickly. ***Do not submit duplicate applications*** Submitting duplicate applications may slow down processing time.

Q: How will I know whether my application has been approved?

A: After an evaluation of the application, the applicant will be notified by email of the approval or denial of their application.

Q: Can a new manufacturer use the same EX number to produce an explosive with the same composition as the previously approved explosive?

A: No. EX approvals are issued to the explosive manufacturers in accordance with 49 CFR § 173.56. If a new manufacturer would like to produce the explosive, it must obtain its own EX approval from PHMSA.

Q: Can I submit a series of devices under one EX application request?

A: Please refer to the general requirements section and specific device requirements in the 2018 APA Standard 87-1C for guidance on series applications.

Q: Can EX approval numbers be transferred or sold?

A: No. EX approval numbers may not be sold and are not transferrable. Please see PHMSA's guidance on this topic:

<https://www.federalregister.gov/documents/2019/10/08/2019-21964/hazardous-materials-clarification-of-process-to-reissue-explosives-classification-approvals>

Q: What are some common reasons for denial?

A: Common reasons for denial include, but are not limited to, the following:

- Application does not comply with 2018 APA Standard 87-1C.
- Inconsistent information in the application, diagram, and/or chemical composition sheet.
- Failure to provide a designation letter for its the U.S. Designated Agent for Service (for foreign applicants).

Q: What if I have additional questions?

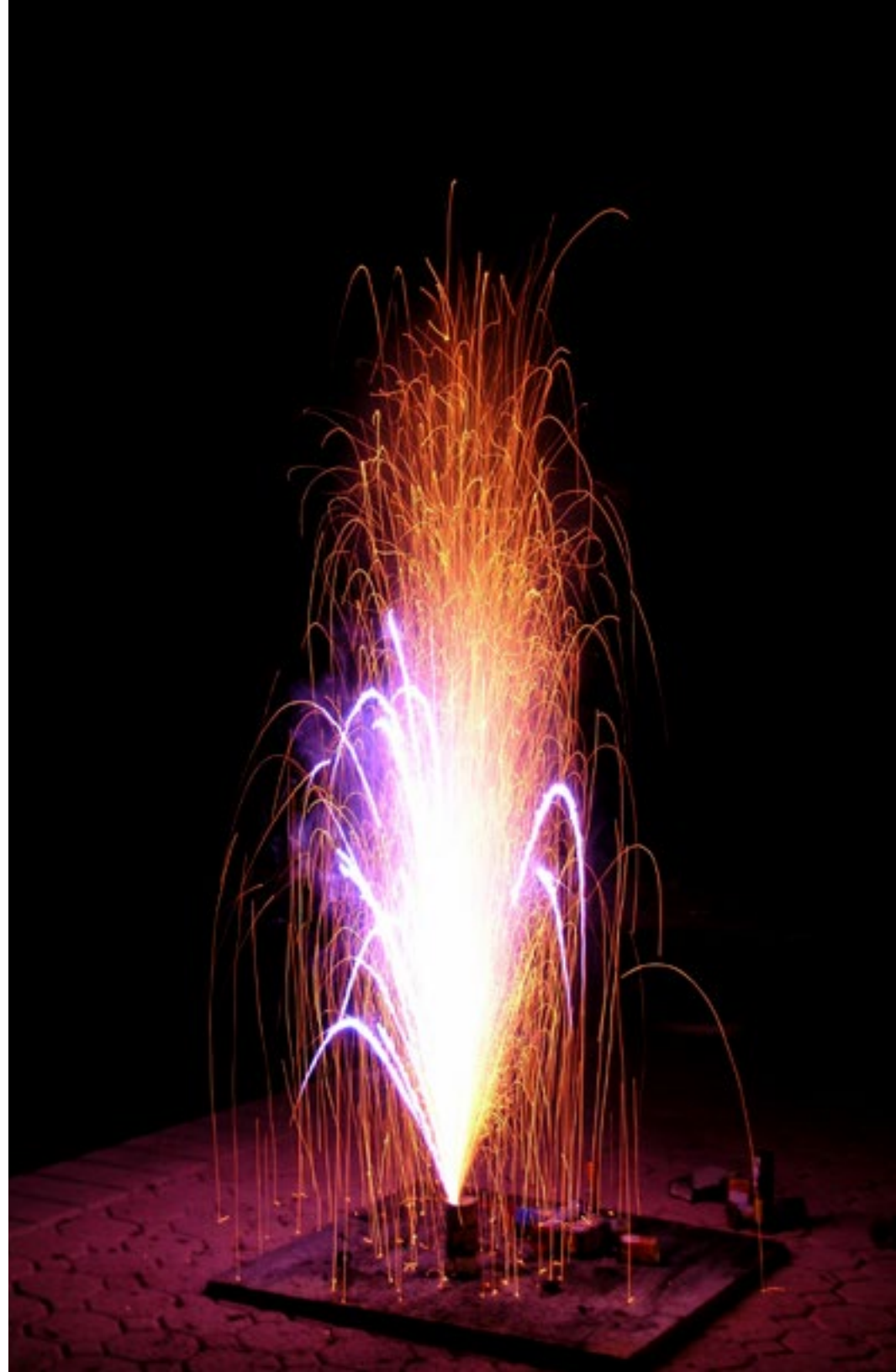
A: Please see below for additional resources:

- The Hazardous Materials Information Center:
 - ◊ Phone Number: 1-800-467-4922
 - ◊ E-mail: infocenter@dot.gov
- PHMSA Energetic Materials Branch at fireworks@dot.gov.
- PHMSA Approvals Website:
 - ◊ <https://www.phmsa.dot.gov/approvals-and-permits/phmsa-approvals-and-permits>

Q: Can the U.S. Designated Agent of service submit an application on behalf of the manufacturer?

A: Yes, the U.S. Designated Agent of service may submit an application and supporting documentation on behalf of a manufacturer. However, the U.S. Designated Agent is neither considered to be the applicant nor the manufacturer. Only an authorized representative from the manufacturer may certify a fireworks application. The EX classification approval will be issued to the manufacturer.

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FOR ADDITIONAL INFORMATION CONTACT:

The Hazardous Materials Info Center
1-800-HMR-4922
(1-800-467-4922)
Email: infocntr@dot.gov
<https://phmsa.dot.gov>

Pipeline and Hazardous Materials Safety Administration
Outreach, Engagement, and Grants Division
1200 New Jersey Ave., SE
Washington, DC 20590
Email: training@dot.gov
202-366-4900
202-366-7342 (Fax)



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