EXPLOSIVES (EX) APPROVALS

Regulatory Guidelines for Shipping and Transporting Fireworks

U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

Revised June 2012

SPECIAL PERMITS and APPROVALS ONLINE

https://hazmatonline.phmsa.dot.gov/online%20approvals/pages/welcome.aspx

Note: This brochure is for general guidance only; always refer to 49 CFR and APA 87-1.

Background on Fireworks

Hazard Classifications for Fireworks

Fireworks are a class of explosive pyrotechnic articles used for aesthetic and entertainment purposes. They can be either consumer or professional (display) grade. They are generally classed as to their chemical compounds and how and where they perform, i.e., ground or aerial.

An explosive means any article that is designed to function by explosion (i.e., an extremely rapid release of gas and heat) or which, by chemical reaction within itself, is able to function in a similar manner even if not designed to function by explosion. The term includes fireworks, which are pyrotechnic articles. No person may offer a new fireworks explosive for transportation unless the device has been classed and approved by the Pipeline and Hazardous Materials Safety Administration's (PHMSA) Associate Administrator for Hazardous Materials Safety. PHMSA is the agency within the U.S. Department of Transportation (DOT) responsible for issuing the Hazardous Materials Regulations (HMR; 49 C.F.R., Parts 171-180).

The criteria for assignment of class and divisions are as follows:

- Division 1.1G (if the major hazard is mass explosion) Fireworks UN0333 (Display). Division 1.1 consists of explosives that have a mass explosion hazard. A mass explosion is one that affects nearly the entire load instantaneously.
- Division 1.3G (if the major hazard is radiant heat or violent burning, or both, but there is no blast or projection hazard) Fireworks UN0335 (Display). Division 1.3 consists of explosives that have a fire hazard and either a minor blast hazard or both, but not a mass explosion hazard.
- Division 1.4G (if there is a small hazard with no mass explosion and no projections of fragments of appreciable size or range) Fireworks UN0336 (Consumer). Division 1.4 consists of explosives that present a minor explosion hazard. The explosive effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire must not cause virtually instantaneous explosion of nearly the entire contents of the package.
- Division 1.4G (if there is a small hazard with no mass explosion and no projections of fragments of appreciable size or range) Articles, Pyrotechnic for technical purposes UN0431 (Theatrical).

Regulatory Authority to Issue Explosive (EX) Classification Approvals

Prior to transportation into and within the U.S., all explosives, including fireworks, must be classed and approved by DOT. Federal Hazardous Materials (hazmat) Transportation Law, 49 U.S.C., 5101 *et seq.*, authorizes DOT to issue classification documents—EX Approvals—in accordance with the procedural requirements in Part 107 and the Hazardous Materials Regulations. All explosives must be in compliance with the HMR, 49 CFR §173.56; however, Division 1.3 and 1.4 fireworks may be classed and approved by the Associate Administrator without prior examination and offered for transportation if the fireworks meet the requirements in §173.56(j) that allow a fireworks device manufactured in accordance with the applicable requirements in the American Pyrotechnic Association (APA) Standard 87-1[1], which is incorporated by reference as part of the HMR. As an alternative, the fireworks must be submitted to a DOT-approved laboratory for examination and classification (see §173.56(b)), or the Associate Administrator may approve a new explosive on the basis of an approval issued for the explosive by the competent authority of a foreign government (see 173.56(f)); for additional information see 49 CFR 173.56(b) or 173.56(f)[2]. If approved, fireworks are assigned an explosives classification number by the Associate Administrator. Approval holders also must comply with the rules set forth by the U.S. Coast Guard; U.S. Customs and Border Protection; Bureau of Alcohol, Tobacco, Firearms and Explosives; as well as the Consumer Product Safety Commission.

EX Approvals and EX Numbers

If granted:

EX Approvals are classification documents that:

- Give written consent, including competent authority approval, from the Associate Administrator for Hazardous Materials Safety or other designated official, to perform a function that requires prior consent under the HMR;
- Are issued to ensure the safe transportation of hazmat (explosives/ fireworks); and
- Assign the proper shipping name, hazard class, UN identification number, and EX Approval number for the fireworks device.

EX numbers:

- Are issued by the Associate Administrator for Hazardous Materials Safety or his designated official;
- Are required prior to transportation into/within the U.S.; and
- Must be placed on the packaging or shipping papers[3].

Applying for an EX Approval (EX number)

To *streamline* and *expedite* the processing of EX Approval applications, PHMSA has created an on-line application process that:

- Allows application access 24 / 7;
- Provides immediate confirmation of application;
- Provides an instant tracking number;
- Stores pre-populated fields, allowing ease of multiple applications;
- Allows attachment of supporting documentation;
- Asks required information, ensuring applications are complete; to
- Enable faster processing/turnaround time.

The on-line EX Approval application process is just a click away:
https://hazmatonline.phmsa.dot.gov/online%20approvals/pages/welcome.aspx

All applicants requesting an EX Approval are encouraged to take advantage of this easy, efficient, automated application process, in lieu of the traditional method of application submission via standard mail, e-mail, or FAX. You may still e-mail, mail, or FAX your application and all supporting documentation to:

E-mail: fireworks@dot.gov

Mail: U.S. Department of Transportation
PHMSA
Associate Administrator for Hazardous Materials Safety
ATTN: Office of Hazardous Materials Approvals & Permits
Energetic Materials (PHH-32)
1200 New Jersey Avenue, SE
East Building, 2nd Floor
Washington, DC 20590-0001

Telephone: Hazmat Info-Center: 1-800-467-4922
FAX: (202) 366-3753

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

Guidelines for Completing an EX Approval Application:

To ensure successful processing, fireworks EX approval applications must be completed in English. Please ensure consistency throughout the application, chemical sheet, and diagram, and be sure to refer to the APA Standard 87-1 and include the following:

- Item name--use the actual item name, name of series, or item number.
- Applicant name, address, telephone number, FAX and e-mail address.-- Applicant is the responsible party; also include job title.
- Applicant/manufacturer e-mail. The manufacturer must be the applicant.
- DOT Class--Mark the correct classification for the device, ex., *Fireworks, UN0336, 1.4G.*
- Manufacturer--name, address, telephone number, FAX and e-mail address.
- U.S. Designated Agent--name, address, telephone number and e-mail address.
- Category of Device--Check as appropriate.
    - If not listed in APA 87-1, application must be submitted in accordance with 49 CFR 173.56(b).
- Description of Device--
    - Effects Produced--You must include a clear description of effects produced; ex., *shoots red stars into air, emits a shower of green and blue sparks,* etc.

      Thermal Stability Test--Must be performed prior to the certification date of the application.
- Certification--Must be signed and dated by applicant.
- Foreign applicants--Must provide Designation of Agent for Service information. See 49 CFR 107.705(a)(5) and 105.40.

Fireworks (EX) Approval Application - APA Standard 87-1

pg. 1

1. **Item Name: WH5555** **This is a series application: No**

2. **Manufacturer/Applicant:**
   Name/Title: **Jane Doe, General Manager**
   Company Name: **Fireworks International Manufacturer**
   Address: **123 Broad Street, Hunan, China**
   Phone: **+1 86-743-12345** **Fax：+1 86-743-123455**
   Email: **fireworksintmfg@how.com**

3. **DOT Class:**

   ☒ Fireworks UN 0336, 1.4G ❑ Fireworks UN 0335, 1.3G

   ❑ Article Pyrotechnic UN 0431, 1.4G

4. **US Designated Agent of Service (for foreign applicants)**
   Agent Name/Title: **John Doe, Associate Manager**
   Company Name: **Company ABC**
   Address: **222 First Street, Washington, DC**
   Phone: **Phone: 202-111-1111 Fax：202-222-2222**
   Email: **johndoe@company.com**

5. **Category of Device:** (*under APA 87-1*):
   ❑Cylindrical Fountain ❑ Cone Fountain

   ❑ Rocket ☒ Mine/Shell

pg. 2

6. **Diagram of the Device:** **See attached.**

7. **Chemical Composition:** **See attached.**

8. **Description of Device:**

   Number of tubes: **8**

   Tube separation (over 200 gram device) : **72 mm**

   Measurements of device: **Length = 30 cm width = 30 cm height = 25.2 cm**

   Maximum powder weight per tube: **Tube A/B/D/F(8shots total): 33.1 grams**
   Tube C/E(4shots total): 31.35 grams

   For 1.4G mine/shell: Max. propellant/tube: **6 grams**

   Maximum effect/tube: **Tube A/B 11.5 grams**

   Total Powder Weight of Fuse in Device: **N/A**

   Total powder weight in device: **148 grams**
   Tubes are fused in sequence (*if UN0336 multiple-tube item*) **Yes**

   Item Complies with base/height ratio, if UN0336: **Yes**

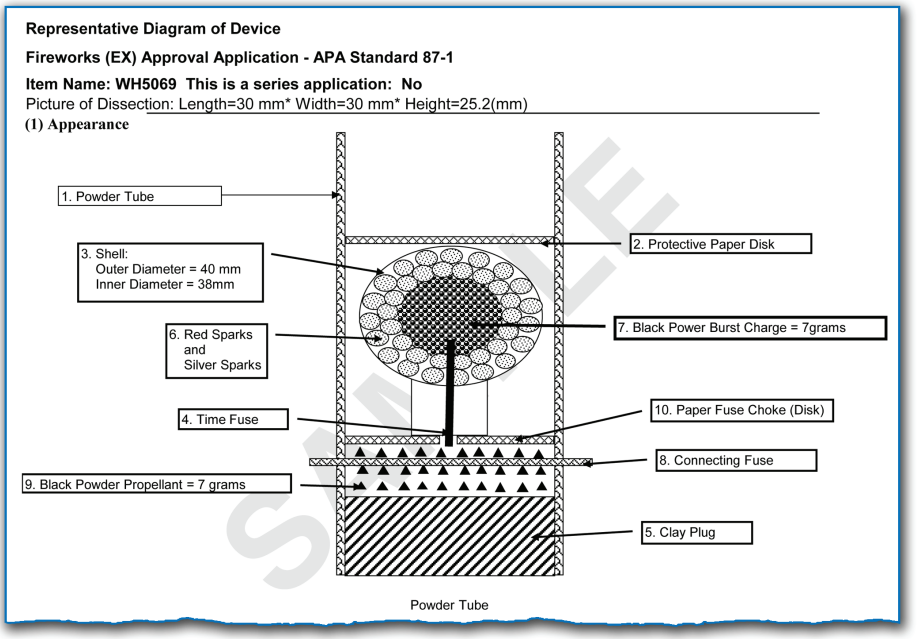
   Does item have a report? **N/A**
   Number of reports per tube: **N/A**
   If yes, max.weight per individual report: **N/A**
   Total weight of report powder in item: **N/A**

   Effect produced: **Tube A : Shoots 2 shots that break into effects of red sparks & crackling. Tube B: Shoots 2 shots that break into effects of purple wave, silver sparks, and peony flower.**

Example of an EX Approval Application

The diagram of the device and chemical composition sheets are required to be included in the application.

- Diagram of Device--Must identify all internal components. Indicate dimensions, fuse location, clay plugs, lift charge or propellant, stars, etc. Approvals will be denied if diagrams are not clear. Component tables also are helpful.
  - *Note*--Diagram must be a representative drawing of the complete device including, as necessary, drawings of the *individual tubes*.
  - If device is produced in more than one size, indicate dimensions for each size. If application covers a series of devices, show a typical representative diagram for the largest item in the series.



Example of a <u>Partial</u> Diagram Showing Only Single Tube

Remarks:

(3) Dissection

No.	Description	Length (cm)	Width (cm)	Hight (cm)	Outer Diameter (cm)	Total Powder Weight (g)
1	powder tube	25	\	\	30mm	\
2	protective paper disk	\	\	\	\	\
3	shell	\	\	\	40mm	\
4	time fuse	\	\	\	\	\
5	clay plug	\	\	\	\	\
6	red sparks & silver sparks	\	\	\	\	6.5
7	black powder burst charge	\	\	\	\	1

Example of a Component Table

- Chemical Composition Sheet--
  - Must list *all* chemicals used[4]. For a series of items, list maximum total weight used in largest item.
  - List name of each type of chemical composition and its respective maximum weight, i.e., *Red Star, 15g; black powder propellant, 10 g.,* etc.
  - Complete the chemical composition sheet by listing the percentage/ weight of each chemical used in each composition. For chemicals not listed, enter approved chemical name under *Other Chemicals* space.
  - Particle size in microns or the mesh size is required for certain metals.
  - Be aware of restricted and prohibited chemicals.

Fireworks Chemical Composition --- APA Standard 87-1

Chemical Composition List for: WH5555

Total weight of pyrotechnic composition in Item: 148 Grams

1. Red sparks, 30 grams **2. Color peony, 20 grams**

3. Peony flower, 30 grams **4. Purple Flame , 30 grams**

5. Black Powder, 8 grams **6. Silver Sparks, 22 grams**

7. Burst charges, 8 grams

Chemicals		Weight % 1	2	3	4	
Potassium Nitrate	KNO_3	13	28	9	25	
Potassium Perchlorate	$KClO_4$	17		14	6	
Ammonium Perchlorate	NH_4ClO_4		7			
Barium Nitrate	$Ba(NO_3)_2$		45	10	10	
Strontium Nitrate	$Sr(NO_3)_2$	19		14	10	
Sulfur	S	12	0	12	12	
Charcoal	C		3	12	15	
Aluminum **Particle Size=120 microns**	AL	10			10	
Magnalium **Particle Size=81 microns**	Mg/Al alloy	12	17	19	12	
Dextrine						
RESTRICTED CHEMICAL						
Potassium Chlorate	$KClO_3$					
Titanium **Particle Size > 149 microns**		17		10		
EACH COLUMN MUST TOTAL		100	100	100	100	

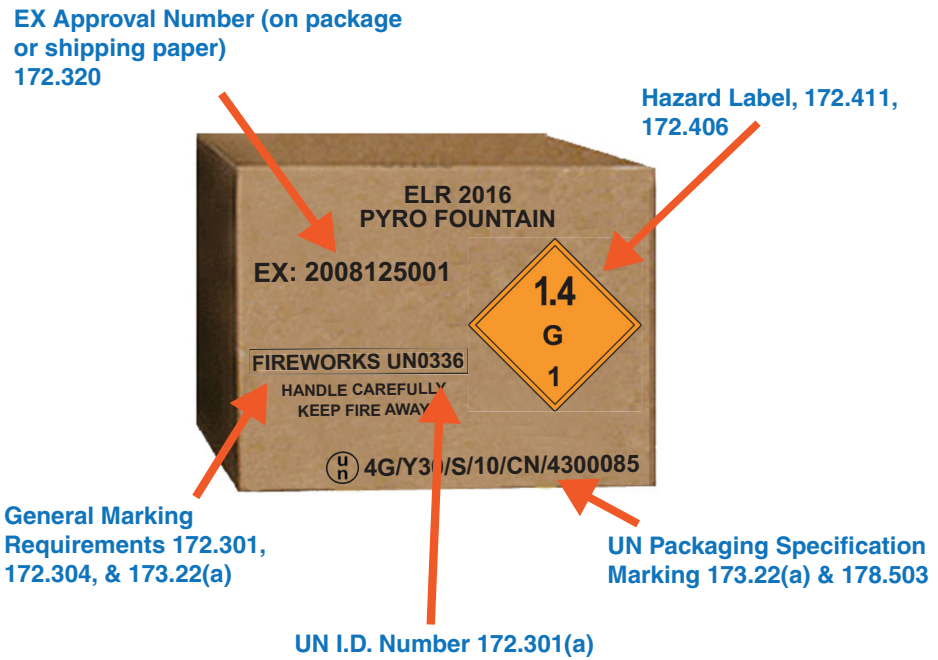
Example of a Chemical Composition Sheet

Preparation for Shipping

Packaging:

For all packaging containing explosives, the following must appear:

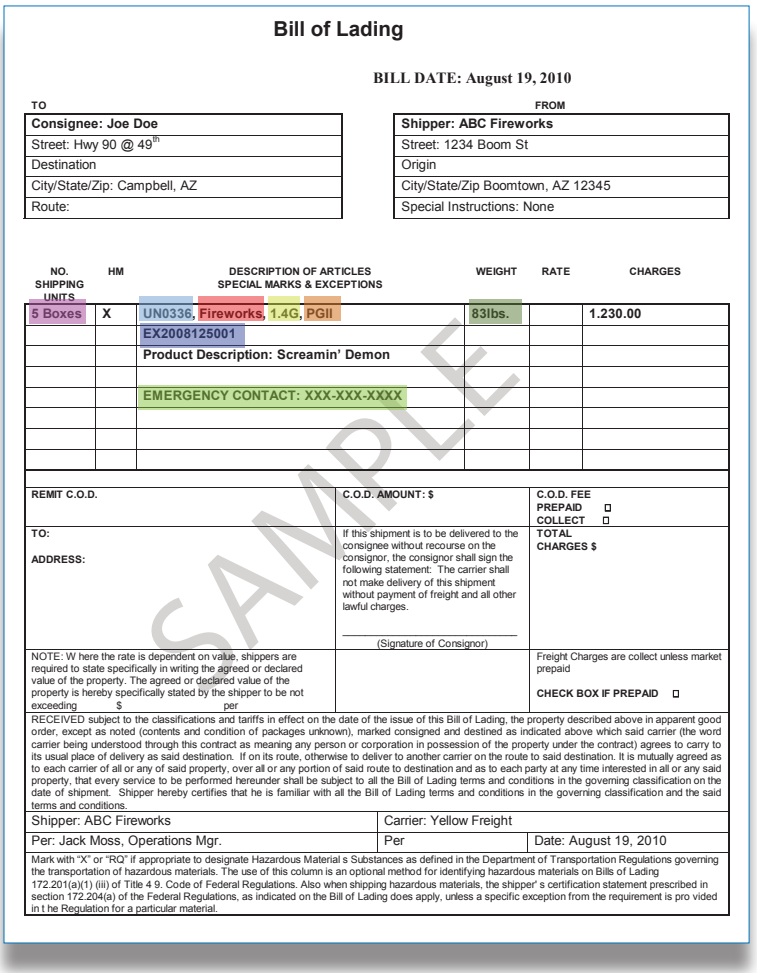
- EX Approval Number (on package or shipping paper);
- Hazard Label;
- Proper Shipping Name (General Marking);
- UN I.D. number; and
- UN Packaging Specification Marking.



Shipping Papers[5]:

The following is required:

- UN I.D. number prescribed for the explosive material;
- Proper shipping name prescribed for explosive material;
- Hazard class or division;
- Packing Group in Roman numerals;
- For Class 1 materials, the quantity must be the net explosive mass;
- EX Number must be placed on either packaging *or* shipping paper;
- The number and type of packages must be included; and
- Must provide an emergency response telephone number[6].



Bill of Lading

BILL DATE: August 19, 2010

TO	FROM
Consignee: Joe Doe	**Shipper: ABC Fireworks**
Street: Hwy 90 @ 49th	Street: 1234 Boom St
Destination	Origin
City/State/Zip: Campbell, AZ	City/State/Zip Boomtown, AZ 12345
Route:	Special Instructions: None

NO. SHIPPING UNITS	HM	DESCRIPTION OF ARTICLES SPECIAL MARKS & EXCEPTIONS	WEIGHT	RATE	CHARGES
5 Boxes	X	UN0336, Fireworks, 1.4G, PGII	83lbs.		1.230.00
		EX2008125001			
		Product Description: Screamin' Demon			
		EMERGENCY CONTACT: XXX-XXX-XXXX			

REMIT C.O.D.	**C.O.D. AMOUNT: $**	**C.O.D. FEE** **PREPAID** ☐ **COLLECT** ☐
TO: **ADDRESS:**	If this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges. _____ (Signature of Consignor)	**TOTAL CHARGES $**
NOTE: W here the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding $ per		Freight Charges are collect unless market prepaid **CHECK BOX IF PREPAID** ☐

RECEIVED subject to the classifications and tariffs in effect on the date of the issue of this Bill of Lading, the property described above in apparent good order, except as noted (contents and condition of packages unknown), marked consigned and destined as indicated above which said carrier (the word carrier being understood through this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery as said destination. If on its route, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed as to each carrier of all or any of said property, over all or any portion of said route to destination and as to each party at any time interested in all or any said property, that every service to be performed hereunder shall be subject to all the Bill of Lading terms and conditions in the governing classification on the date of shipment. Shipper hereby certifies that he is familiar with all the Bill of Lading terms and conditions in the governing classification and the said terms and conditions.

Shipper: ABC Fireworks	Carrier: Yellow Freight	
Per: Jack Moss, Operations Mgr.	Per	Date: August 19, 2010

Mark with "X" or "RQ" if appropriate to designate Hazardous Material s Substances as defined in the Department of Transportation Regulations governing the transportation of hazardous materials. The use of this column is an optional method for identifying hazardous materials on Bills of Lading 172.201(a)(1) (iii) of Title 4 9. Code of Federal Regulations. Also when shipping hazardous materials, the shipper' s certification statement prescribed in section 172.204(a) of the Federal Regulations, as indicated on the Bill of Lading does apply, unless a specific exception from the requirement is pro vided in t he Regulation for a particular material.

Example of a Shipping Paper

Monitoring Compliance and Ensuring Safety

Compliance with the terms of an Approval is the responsibility of the person or company authorized to perform the specific function(s). To ensure that Approvals are used safely and in accordance with the required terms and conditions, and 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. An EX Approval may be suspended or terminated if the performance of the holder fails to meet required conditions.

Persons found to be in violation of the HMR may be subject to civil penalties, criminal fines, and imprisonment. Maximum penalties depend on several factors, including the nature and circumstances, extent and gravity, and severity of the consequences of the violation, but can range from $250 up to $110,000 per violation for a civil penalty, and $500,000 and 10 years imprisonment for a criminal penalty.

Frequently Asked Questions

Q Where can I find information on applying for fireworks EX numbers?

A Information regarding fireworks, the approval process for an EX application, a sample application, and additional information can be found on: http://www.phmsa.dot.gov/hazmat/regs/sp-a/approvals/fireworks

Q Can I apply for an Approval on-line?

A Yes, you can apply on-line via our automated application process: https://hazmatonline.phmsa.dot.gov/online%20approvals/pages/welcome.aspx

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

A All applications can be tracked via: http://www.phmsa.dot.gov/hazmat/regs/sp-a/approvals/search. Complete on-line applications that include an e-mail address and all supporting documentation will receive an instant 10-digit tracking number as confirmation of receipt.

Q What information should be included with my application?

A The application should include a cover letter (one cover sheet for multiple applications submitted at the same time), the request application, chemical composition sheet, and diagram. If mailing, do not staple applications.

Q Can I still obtain a renewal or use the Class A, B, and/or C classification of explosives Approvals issued prior to 1991?

A No. DOT previously classed fireworks and similar devices as Classes A, B, or C according to their potential hazards for shipping and use. On October 1, 1993, DOT reclassified explosive devices according to a new classification system. Explosive devices previously classed A, B, or C are no longer valid, see *Federal Register*, Vol. 55, No. 246, dated December 21, 1990.

Q What additional information must a foreign applicant provide when requesting an Approval?

A Foreign applicants must provide a Designation of Agent for Service in accordance with 49 CFR 107.705(a)(5) and 105.40.

Frequently Asked Questions (cont'd)

Q Can the Thermal Stability test be conducted and dated the same date as the application?

A A thermal stability test must be completed on any fireworks device approved for transportation. The material must not ignite, explode, or undergo significant decomposition during heating at 75° C (167 ° F) for 48 consecutive hours. The test must be completed prior to the signed certification of the application.

Q Are tracking numbers different from EX numbers?

A Yes--do not confuse these numbers! Both are 10 digits; however, tracking numbers are issued for internal application tracking purposes only. EX numbers are assigned when the device is classed and approved.

Q How long do EX Approval applications typically take to process?

A Typically, 120 days. Please do not submit duplicate applications as this will only slow down processing.

Q How can I check the status of my application?

A Applications may be tracked, via your tracking number, within the Approvals database: http://www.phmsa.dot.gov/hazmat/regs/sp-a/approvals/search

Q How will I know if my fireworks devices are approved?

A After evaluation of the device, a *determination is made* based on compliance with APA 87-1, or examination/classification from a DOT-approved laboratory. If you applied on line and your application is approved, the EX Approvals on-line database will automatically e-mail an Approval letter or denial letter. (Explanations will be given for denials.) (DOT may send correspondence to foreign companies' Designation of Agents for Service.) All other applicants will be notified via e-mail, mail, or FAX, depending on how they applied.

Q Can I change manufacturer using the same EX number?

A No.

Q Can I submit a series of devices under one EX number?

A Because of the complexities involved, contact the Approvals Office.

Q Can I request a classification for a 1.1G device under the APA Standard 87-1?

A No. The Hazardous Materials Regulations require that Division 1.1G fireworks must be examined by a DOT-approved explosives test laboratory and assigned a recommended shipping description, division, and compatibility group in accordance with § 173.56(b) or 173.56(f). See Federal Register Notice 11-6.

Frequently Asked Questions (cont'd)

Q Can EX numbers be transferred or sold?

A No. EX numbers are non-transferrable; therefore, they may not be sold or transferred. See Federal Register Notice 11-13.

Q What are some common reasons for denial?

A

- Application does not comply with APA 87-1;
- Lack of consistency with Application, Diagram, and Chemical Composition Sheet;
- Device exceeds composition limits;
- Chemical compositions not totaling 100%;
- Fusing is not sequential; and
- Failure to designate and/or provide a Designation of Agent for Service

Q What if I have additional questions?

A Hazmat Info-Center: 1-800-467-4922 e-mail: infocenter@dot.gov
PHMSA Approvals Website: http://www.phmsa.dot.gov/hazmat/regs/sp-a/approvals
PHMSA Approvals Database Search: http://www.phmsa.dot.gov/hazmat/regs/sp-a/approvals/search
See also: http://www.phmsa.dot.gov/hazmat

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 the application and supporting documentation on behalf of the manufacturer, however the application must be certified by the applicant. The EX classification approval will be issued to the manufacturer/applicant. See Federal Register Notice10-9.

Endnotes:

[1] A current copy of the APA Standard 87-1 (2001 ed.) may be obtained by contacting the APA, P.O. Box 30438, Bethesda, MD 20824, (301) 907-8181, FAX (301) 907-9148, www.americanpyro.com. See also 49 CFR 171.7 for document inspection availability.

[2] See 49 CFR 173.56(b) or 173.56(f).

[3] See APA 87-1(5) and 49 CFR 172.320.

[4] See APA 87-1, Table 4.3-1 for a list of approved chemicals.

[5] See 49 CFR Subpart C - Shipping Papers § 172.201, 202, 320 for all requirements.

[6] See 49 CFR 172.604.

For information about other
Hazmat Publications or training questions:

Visit our website: http://hazmat.dot.gov
Telephone: (202) 366-4900
FAX: (202) 366-7342
E-mail: training@dot.gov

Or write:
U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
1200 New Jersey Avenue, SE, PHH-50
Washington, DC 20590-0001

Celebrate Safety. Celebrate Safely.

U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration

PHH50-0129-0612