



DEPARTMENT OF TRANSPORTATION
 MATERIALS TRANSPORTATION BUREAU
 WASHINGTON, D.C. 20590

52083

[49 CFR Parts 172, 173, 174, 176, 177]
 [Docket No. HM-143; Notice No. 76-11]

BLASTING AGENTS

Proposed Rule Making

Purpose. The purpose of this notice of proposed rulemaking is to propose the following amendments to Parts 172, 173, 174, and 176 of the Department's Hazardous Materials Regulations:

1. Remove the shipping name Nitro carbo nitrate;
2. Add a new shipping name, Blasting agent, n.o.s. and a new class, Blasting agent;
3. Provide packagings for Blasting agents; and
4. Provide a new label and a new placard for Blasting agents.

The Department of Transportation's Hazardous Materials Regulations do not now include a definition of a blasting agent. A material used for blasting must be classified as one of three classes—Class A explosive, Class B explosive, or Oxidizer (nitro carbo nitrate). Neither the Class B explosive nor the Oxidizer classification is appropriate for many blasting agents.

On April 19, 1972, the Institute of Engineers of Explosives petitioned the Hazardous Materials Regulations Board to create a new hazard class called "Blasting Agents."

The inclusion of a blasting agent description and hazard class will contribute to increased safety in transportation because some materials now shipped as nitro carbo nitrates (oxidizing materials) also present a potential explosive hazard.

Both the Mining Enforcement and Safety Administration (MESA) and the Bureau of Alcohol, Tobacco, and Firearms (BATF) publish definitions of blasting agents. MESA bases its storage

requirements on the classification of an explosive as determined by this Department. Many materials used for blasting which would be considered blasting agents by MESA and BATF must be classed as Class B explosives under the DOT regulations. MESA requires magazine storage for DOT Class B explosives, but does not require magazine storage for materials identified as blasting agents.

In an effort to resolve these problems and to bring the DOT regulations into closer conformity with the regulations of MESA and BATF, the Materials Transportation Bureau (MTB) is proposing to incorporate a definition of a blasting agent into the DOT regulations. This definition is essentially the same as the statutory definition in the explosives laws administered by BATF (18 U.S.C., Section 841(e)) with certain additions which MTB considers necessary to achieve an acceptable level of safety in transportation.

The MTB considers blasting agents to be very insensitive explosives and is proposing that they be subject to the requirements of Section 173.86 which prescribes shipping requirements for new explosives. The MTB is also proposing a blasting agent label and placard.

Blasting agents would not be subject to specification packaging requirements. In addition, the MTB is proposing to delete the description, nitro carbo nitrate, from the regulations since all materials now so described would be included in the Blasting agent, n.o.s. description. A reasonable time would be provided for the change in the description of those materials now identified as nitro carbo nitrates to be revised to the blasting agent description.

The proposal requires more tests and spells out more detailed testing than are now required for Class A and Class B explosives because:

1. The packaging requirements for blasting agents are less restrictive than those for Class A and Class B explosives and, therefore, additional testing is considered necessary to clearly establish the basis for regarding a particular substance as a blasting agent; and

2. The Materials Transportation Bureau regulatory plan includes several changes such as rewriting the present explosive regulations. Some of the tests required for blasting agents (and possibly other tests not delineated here) could be incorporated in the proposed regulations. It is desirable to publish a blasting agent definition as expeditiously as possible, since the complete revision of the explosive section will be published in a future notice of proposed rulemaking.

The 212° F. temperature specified in the differential thermal analysis test is not found in any of the present regulations. It was chosen because many blasting agents contain appreciable quantities of water which can be affected at or above this temperature.

In consideration of the foregoing, it is proposed to amend Parts 172, 173, 174, and 176 of Title 49 as follows:

PART 172—HAZARDOUS MATERIALS TABLE AND HAZARDOUS MATERIALS COMMUNICATIONS REGULATIONS

1. In Part 172 Table of Sections, § 172.411 would be revised; § 172.523 would be redesignated § 172.524 and a new § 172.523 would be added to read as follows:

- Sec.
 172.411 Explosive A, Explosive B, Explosive C, and Blasting Agent labels.
 172.523 Explosives B placard.
 172.524 Blasting Agents placard.

2. Section 172.101 would be amended by deleting the entry "nitro carbo nitrate" and adding "Blasting agent, n.o.s." to read as follows:

§ 172.101 Hazardous Materials Table.

(1) */W/A Hazardous materials descriptions and proper shipping names	(2) Hazard class	(3) Label(s) required (if not excepted)	(4) Packaging		(5) Maximum net quantity in 1 package		(6) Water shipments		
			(a) Exceptions	(b) Specific requirements	(a) Passenger carrying aircraft or railcar	(b) Cargo only aircraft	(a) Cargo vessel	(b) Passenger vessel	(c) Other requirements
(Add) blasting agent, n.o.s.	Blasting agent	Blasting agent	None	173.96	Forbidden	100 lb		1, 2	1, 2

3. In § 172.411 the Heading would be revised and new paragraphs (c) and (d) would be added to read as follows:

§ 172.411 Explosive A, Explosive B, Explosive C, and Blasting Agent labels.

(c) Except for size and color, the BLASTING AGENT label must be as follows:



(d) In addition to complying with § 172.407, the BLASTING AGENT label must be orange. The printing must be black.

4. Section 172.524 would be redesignated to read "§ 172.523" and a new § 172.524 would be added to read as follows:

§ 172.524 Blasting Agents placard.

(a) Except for size and color, the BLASTING AGENTS placard must be as follows:



(b) In addition to meeting the requirements of this part, the BLASTING AGENTS placard must be orange with a 1/2-inch (12.7 mm) white outer border. The printing must be black.

Appendix B [Amended]

5. Appendix B to Part 172 would be amended by adding a new paragraph (c) (19) to read as follows:

(c) (19) BLASTING AGENTS placard. The words BLASTING AGENTS must be across the center area of the placard and made with letters 1 3/8 inches (47.6 mm.) high with a 5/16-inch (7.9 mm.) stroke.

PART 173—SHIPPERS—GENERAL REQUIREMENTS FOR SHIPMENTS AND PACKAGINGS

6. In Part 173 Table of Sections, § 173.86 would be revised; § 173.96 would be added to read as follows:

Sec. 173.86 New explosives (including blasting agent), definition; approval and notification. 173.96 Blasting agents.

7. Section 173.86 Heading would be revised to read as follows:

§ 173.86 New explosives (including blasting agent), definitions; approval and notification.

8. Section 173.96 would be added to read as follows:

§ 173.96 Blasting agents.

(a) Definition of a blasting agent. A blasting agent is a material which has been tested in accordance with paragraph (b) of this section and as a result found to be so insensitive that there is very little probability of initiation to explosion or of transition from burning to detonation under conditions incident to transportation and which is primarily intended for use in mining activities as described in Division B of the 1972 edition of the Standard Industrial Classification Manual.

(b) Tests. Materials which are to be described as Blasting agents, n.o.s. for purposes of transportation, must be tested in accordance with this paragraph. Interpretations of the test results are provided in the test procedures.

(1) Blasting cap sensitivity test. (i) The container used for the blasting agent sample must be cylindrical, having a diameter of 3 3/8 inches and a length of 6 3/8 inches. The container must provide essentially no confinement.

(ii) A hole 3/8-inch in diameter shall be punched through the sidewall of the container 1/2-inch above the bottom closure.

(iii) A 3-foot length of detonating cord (50 grains of PETN per foot) must be inserted through the hole so that one end touches the wall of the container diametrically opposite the hole.

(iv) The container must be filled with the sample. Solid materials must be packed to the same filling density as they will be packed in the shipping container. The temperature of the sample must be between 70° F. and 75° F.

(v) The filled container must be placed on a level earthen surface with the protruding end of the detonating cord "telltale" laid out flat.

(vi) A commercial No. 8 fuse blasting cap (electric blasting cap) must be inserted in the center of the top of the sample for the full length of the cap. A No. 8 commercial cap means a cap which contains 0.40-0.45 grams of PETN base charge pressed into an aluminum shell with bottom thickness not to exceed 0.03-inch to a specific gravity of not less than 1.4g/cc and primed with standard weights of primer depending on the manufacturer.

(vii) Detonation of the sample is indicated by the detonation of the detonating cord "telltale".

(viii) The test must be conducted three times or until detonation occurs, whichever comes first.

(ix) A material which detonates in trial may not be described as Blasting agent, n.o.s. for purposes of transportation.

(2) Rifle bullet sensitivity test. (i) The container used for the blasting agent sample must be cylindrical, having a diameter of 3 3/8 inches and a length of 3 inches. The container must provide essentially no confinement. A mild steel plate 4 inches square x 1/2-inch thick must be affixed to one end of the container.

(ii) The container must be filled with the blasting agent under test. Solid materials must be packed to the same filling density as they will be packed in the shipping containers. The temperature of the sample must be between 70° F. and 75° F.

(iii) The open end of the filled container must be covered with a material which presents essentially no resistance to the passage of the bullet.

(iv) The filled container must be placed in a horizontal position with the plane of the cover normal to the trajectory of the bullet and facing the rifle.

(v) The test bullet must be fired through the 3-inch column of blasting agent as near the center as practicable and so that it impacts or penetrates the steel plate after passing through the sample. The bullet used must weigh at least 48 grains and be propelled at a muzzle velocity of at least 2700 feet per second. The muzzle of the rifle must be located not more than 100 feet from cover of the sample container.

(vi) Detonation of the sample is indicated by sound and by damage to the steel plate in excess of that caused by the bullet.

(vii) The test must be conducted three times or until detonation occurs, whichever comes first.

(viii) A material which detonates in any trial may not be described as Blasting agent, n.o.s., for purposes of transportation.

(3) Differential thermal analysis test. (1) This test must be conducted using a standard, commercially produced, differential thermal analysis instrument or a laboratory-constructed apparatus which gives comparable results.

(ii) Care must be taken to insure that the portion of the blasting agent tested is representative of the complete mixture.

(iii) The test must be conducted three times. If the first exotherm exhibited by the material in any trial is less than 212° F., it may not be described as a Blasting agent n.o.s. for purposes of transportation.

(4) Thermal stability test. (i) At least 500 grams of the material must be placed in a loosely covered glass vessel and maintained at 167° F. for 48 consecutive hours.

(ii) A material which ignites or evidences decomposition by fumes, discoloration, or other characteristics may not be described as Blasting agent, n.o.s., for purposes of transportation.

(5) Spark sensitivity test. (i) The apparatus must be designed so that electrostatic spark can be caused to jump from a pointed electrode to a metal plate which also serves as a sample holder.

Ten milligrams of material must be used for each test. Care must be taken to insure that the sample is representative of the material being tested.

(iii) Ignition must be evidenced by the material flaming, smoldering, or glowing from the spark.

(iv) The test must be conducted three times or until ignition occurs, whichever comes first.

(v) A material which ignites in any trial when exposed to a spark of 0.006 joules delivered from a 0.002 to 0.004 micro-farad capacitor may not be described as a Blasting agent, n.o.s., for purposes of transportation.

(6) *Impact sensitivity test.* (i) Impact tests must be conducted in the Bureau of Explosives Impact Tester.

(ii) The tests must be run on ten milligram samples. Care must be taken to assure that the test portions are representative of the material being tested.

(iii) The drop height used in all trials must be ten inches.

(iv) The test must be conducted ten times or until an explosion occurs, whichever comes first. An explosion is evidenced by flame or flame and noise. The production of smoke alone is evidence of decomposition, but not explosion.

(v) A material which explodes in any trial may not be described as Blasting agent, n.o.s., for purposes of transportation.

Fire test. (i) The largest package in type to be offered for transportation must be placed on incombustible supports and subjected to a fire.

(ii) The fuel used may be kerosene-soaked wood, flammable or combustible liquid, or flammable gas.

(iii) The fire shall be large enough to engulf the bottom of the package. The flames must reach at least half way up on all sides.

(iv) The duration of the fire must be such as to cause the material in the package to burn or fume off completely.

(v) Explosion is evidenced by a loud noise and the projection of fragments from the fire area.

(vi) This test must be conducted at least once.

(vii) Any material which explodes in this test may not be described as Blasting agent, n.o.s., for purposes of transportation.

(8) *Card gap test.* (1) A card gap test must be run as described in paragraph 3-12 of "Explosive Hazard Classification Procedures" contained in DOD TB 700-2 (May 19, 1967), (NAVORDINST 8020.3 to 11A-1-47, DSAR 8220.1).

(ii) This test must be conducted three times or until detonation occurs, whichever occurs first.

(iii) Any material which detonates with a gap of more than 70 cards may not be described as Blasting agent, n.o.s., for purposes of transportation.

(c) *Packaging for blasting agents.* (1) Each package of blasting agents when prepared for shipment must comply with the applicable requirements of § 173.24 and as one of the following tests:

(i) Rigid packages (e.g., boxes and drums), prepared as for shipment, must be capable of withstanding a four-foot drop onto solid concrete so as to strike the most vulnerable point on the package without rupture or any loss of contents.

(ii) Non-rigid packages (e.g., tubes and bags), prepared as for shipment, must be capable of withstanding three four-foot drops into solid concrete without rupture or any loss of contents.

(2) Blasting agents shall not be transported in portable tanks, cargo tanks, tank cars, or compressed gas cylinders.

(d) See §§ 174.81, 176.80, and 177.848 of this subchapter for loading requirements.

§ 173.182 [Amended]

9. In § 173.182 paragraph (a) would be amended by deleting "nitro carbo nitrate (see Note 1)" in the fourth and fifth lines from the end of the paragraph; Note 1 and paragraph (c) would be deleted.

PART 174—CARRIAGE BY RAIL

§ 174.81 [Amended]

10. In § 174.81(a) Table would be amended by adding "Blasting agent" as the last entry under Class B Explosives and placing an "X" in the columns headed, "Initiating and primary explosives," and "Fireworks, special or railway torpedoes," Note e following the table would be amended by striking the words "nitrocarbonitrate or" in the first line.

PART 176—CARRIAGE BY VESSEL

11. In Part 176 Table of Sections, Subpart J Heading and §§ 176.410 and 176.415 would be revised to read as follows:

Subpart J—Detailed Requirements for Flammable Solids, Oxidizers, Organic Peroxides, and Blasting Agents

Sec.

176.410 Blasting agents and ammonium nitrates.

176.415 Permit requirements for blasting agents and certain ammonium nitrates.

12. Section 176.83(a) Table would be amended by redesignating numbers "11 through 16" as "12 through 17" and adding a new number 11 to read as follows:

11 Blasting agents

An "X" would be added in column 3 and 10 opposite entry number 11.

13. Subpart J Heading would be revised to read as follows:

Subpart J—Detailed Requirements for Flammable Solids, Oxidizers, Organic Peroxides, and Blasting Agents

14. Section 176.410 Heading and paragraph (a)(1) would be revised; the introductory text of paragraphs (c), (d), and (e) and paragraph (e)(1) would be amended by deleting the words "nitro carbo nitrate" and adding "blasting agents" in place thereof:

§ 176.410 Blasting agents and ammonium nitrates.

(a) * * *

(1) Blasting agents.

* * * * *

15. Section 176.415 Heading would be revised; paragraphs (a)(2), (c)(1) and (c)(2) would be amended by deleting "nitro carbo nitrate" and inserting "blasting agents" in place thereof:

§ 176.415 Permit requirements for blasting agents and certain ammonium nitrates.

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PART 177—CARRIAGE BY PUBLIC HIGHWAY

§ 177.848 [Amended]

16. Section 177.848(a) Table would be amended by adding "Blasting agents" as the last entry under Class B Explosives and placing an "X" in the columns headed, "Initiating and primary explosives * * *," and "Fireworks, special or railway torpedoes." Note e following the table would be amended by striking the words "nitro carbo nitrate or" in the first line.

Interested persons are invited to give their views on these proposals. Communications should identify the docket number and be submitted to the Docket Clerk, Office of Hazardous Materials Operations, Department of Transportation, Washington, D.C. 20590. Communications received on or before March 25, 1977, will be considered before final action is taken on these proposals. All comments received will be available for examination by interested persons at the Office of Hazardous Materials Operations, Room 6500, Trans Point Building, 2100 Second Street, S.W., Washington, D.C., both before and after the closing date for comments.

(49 U.S.C. 1803, 1804, 1808; 49 CFR 1.53 (e) and paragraph (a)(4) of App. A to Part 102.)

The Materials Transportation Bureau has determined that this document does not contain a major proposal requiring preparation of an Inflation Impact Statement under Executive Order 11821 and OMB circular A-107.

Issued in Washington, D.C., on November 16, 1976.

DR. C. H. THOMPSON,
Acting Director, Office of
Hazardous Materials Operations.
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