



U.S. Department
of Transportation

**Research and
Special Programs
Administration**

400 Seventh Street, S.W.
Washington, D.C. 20590

MAY 22 2001

Mr. Aaron Greso
Atlantic Research Corporation
5945 Wellington Road
Gainesville, Virginia 20166-1699

Ref. No. 01-0095

Dear Mr. Greso:

This responds to your April 17, 2001 letter requesting clarification on the correct classification of your mixture under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Specifically, you ask for the correct classification of a mixture of silver nitrate and potassium nitrate, each of which is classed as a Division 5.1 material.

Your understanding that a "new" material must be tested as a Class 1 explosive using the "Card Gap" test under the UN Manual of Tests and Criteria is incorrect. Such a test is required only where other information indicates the material could have explosive properties. Under the HMR, it is the shipper's responsibility to determine the hazard class of the material to be transported. This Office does not perform that function. In making this determination, you must consider the characteristics of the entire mixture rather than its individual components. Based on the test results and information provided in your letter, it is the opinion of this Office that the mixture of silver nitrate and potassium nitrate should be classed according to the Division 5.1 packing group criteria in § 173.127 of the HMR.

I hope this answers your inquiry.

Sincerely,



John A. Gale

Transportation Regulations Specialist
Office of Hazardous Materials Standards



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172.101

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6946 Wellington Road
Gainesville, Virginia 20166-1699
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April 17, 2001

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Classification
SEQUA
01-0095

Edward T. Mazzullo
Director for the Office of Hazardous Material Standards
U.S. Department of Transportation RSPA (DHM10)
400 7th St. SW
Washington DC 20590-0001

FX 202 366-3012

Dear Mr. Mazzullo,

I am writing to you to request an interpretation of the standards as applied to a mixture of already classified materials.

We are planning to make a mixture of silver nitrate (AgN) and potassium nitrate (KN). Each is already classified as 5.1 (class II for the silver nitrate). The material required no new synthesis to fabricate. Still, the newness of this material might be assigned due to the melt blending of both nitrates, occurring at about 170 °C, initially. This enables the resulting eutectic material, formed earlier, to melt at about 131 °C. [1]

However, according to the UN "Orange book", Transport of Dangerous Goods, Manual of Tests and Criteria, all "new" materials should be tested as a Class 1 explosive in a "Card Gap" test.

This requirement, for this material, is somewhat puzzling. When this material is placed upon a hot plate, operating in the area of 400 °C, the material bubbles and boils away—without a flame. When investigated using a DSC (differential scanning calorimeter), the material shows no exotherm until exceeding 400 °C—after which temperature, the exotherm could represent the decomposition of silver nitrate. (Decomposition temperature of AgN is 444 C; KN melts at 334 °C, AgN melts at 212 °C.)

In addition, the material passes all of the following material hazards at the highest settings: 1) "Drop weight" >8 Kg @ 50 cm; 2) "Friction" >1800 psi @ 90°, and 3) "ESD" >8 Joules. [All three tests showing 10 subsequent negative results for each test].

Since the material will not burn by itself, nor will it ignite when physically manipulated in a rigorous manner, is it possible to interpret this material as not being a Class 1 material?

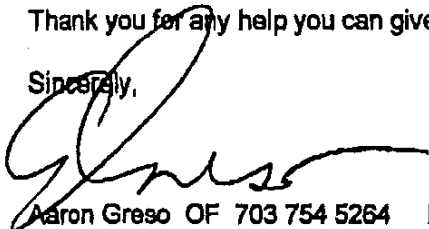
I would like to classify this material as a 5.1 Class II, simply because silver nitrate, the most hazardous material in the mixture, is classified as 5.1 Class II.

Can the test results, listed above, be interpreted as indicating that the material is not a Class 1.x material?

I would prefer not to have to ship off site, an expensive, used, unburned material, recovered from a card-gap test, for recycling.

Thank you for any help you can give.

Sincerely,



Aaron Greso OF 703 754 5264 FX 703 754 5346

[1] K. Mezaros Szecsenyi, K. Tomor, and G. Pokol; *J. Thermal Analysis*, 41 (1984) 125-134