



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

1200 New Jersey Avenue, SE  
Washington, DC 20590

MAR 08 2013

Mr. Jerry W. Freeman  
Director, Transportation Compliance  
Air Liquide USA LLC  
2700 Post Oak Boulevard, Suite 1800  
Houston, TX 77056

Reference No. 13-0003

Dear Mr. Freeman:

This is in response to your December 3, 2012 letter requesting clarification on the proper classification and shipping description of "Trisilylamine" (CAS No. 13862-16-3) under the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). You state this chemical is a liquid developed for use in the semiconductor industry. You also state the material was tested in conformance with the hazardous material classification criteria prescribed in the HMR and determined to meet the following four hazard classes in order of precedence:

- Division 6.1 (poisonous), Packing Group (PG) I, Hazard Zone B;
- Division 4.3 (dangerous when wet), PG I;
- Class 8 (corrosive, dermal), PG I;
- Class 3 (flammable liquid), PG II.

You ask if the proper shipping description "UN 3491, Toxic by inhalation, liquid, water-reactive, flammable, n.o.s. (Trisilylamine), 6.1, (4.3, 3), PG I, Zone B" is the most appropriate selection for shipping this material throughout the United States and internationally.

The answer is yes. However, for transport within the United States in accordance with the HMR, § 172.402(a)(2) requires all hazardous materials with a Class 8, PG I, subsidiary hazard to be labeled with a subsidiary CORROSIVE hazard warning label in all modes of transport. Therefore, the subsidiary hazard class must be entered in the proper shipping description as well (see § 172.202(a)(3)).

I hope this satisfies your request.

Sincerely,

T. Glenn Foster  
Chief, Regulatory Review and Reinvention Branch  
Standards and Rulemaking Division



AIR LIQUIDE

December 3, 2012

Certified Return- Receipt

U.S. Department of Transportation
Standards & Rulemaking Division - East Building
Pipeline Hazardous Materials Safety Administration
Attn: Mr. Charles E. Betts (PHH-10)
1200 New Jersey Avenue, SE
Washington DC 20590-0001

Edmonson
§172.101
§173.2a
Classification
13-0003

Dear Mr. Betts,

I am writing your office to request a formal letter of guidance and interpretation on the classification of Trisilylamine (TSA) [N(SiH3)3, CAS # 13862-16-3] that is processed by Air Liquide. TSA is a chemical substance developed for applications in the semiconductor industry, and has recently undergone a series of analytical and scientific tests to determine certain characteristics. These tests were conducted by various independent and specialized certified testing agencies over the course of the last several months. The results of these tests have revealed that TSA exhibits the following characteristics as defined by the classification criteria outlined in 49 CFR Subpart D of Part 173:

- Hazard Class Division 6.1: Toxic by Inhalation (Inhalation Hazard Zone B), PG I
• Hazard Class Division 4.3: Water Reactive, PG I
• Hazard Class 8: Corrosive (Dermal), PG I
• Hazard Class 3: Flammable Liquid, PG II

Based on 49 CFR §173.2a, Precedence of Hazard Table, available and appropriate D.O.T. Basic Descriptions' found in 49 CFR §172.101 (Hazardous Materials Table), Air Liquide has selected 'UN3491, Toxic by inhalation liquid, water-reactive, flammable n.o.s. (Trisilylamine)' for identifying TSA for shipments offered throughout the United States and international community.

Correspondence with the US DOT Hazardous Materials Information Center and other professional and technical leaders within our industry concur with our decision. However, this description excludes the corrosive characteristics of TSA. Air Liquide and its partners are seeking regulatory guidance and interpretation from your office on the proper classification of TSA based on the current regulations of Title 49 CFR (Revised as of October 1, 2012).

Air Liquide is committed to the safe and compliant transportation of hazardous materials. Should you have any questions or require further information, please do not hesitate to contact me directly at 713.624.8213 or by email at jerry.freeman@airliquide.com

Respectfully,

Jerry W. Freeman

Jerry W. Freeman
Director, Transportation Compliance
Air Liquide USA LLC