U.S. Department
of Transportation
**Research and
Special Programs
Administration**

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

JUN 25 2003

Ref. No.: 02-0305

Mr. Michael F. Morrone
Keller and Heckman LLP
1001 G. Street, N.W.
Suite 500 West
Washington, D.C. 20001

Dear Mr. Morrone:

This responds to your letter regarding applicability of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) to your client's products, "expanded polymeric microspheres". These microspheres are marketed as Sovereign's Dualite® products and are used in a wide variety of applications, including automobile coatings, sporting equipment, and building materials. Subsequently, test data was provided for these products.

You provided information, as follows:

> Your client's Dualite® products consists of flexible, ultra-low density thermoplastic hollow microsphere cores that have been filled with gas, approximately 1.5 percent by weight of volatile hydrocarbons (i.e., propane, isopentane, and/or isobutane), and surface coated with calcium carbonate. The microspheres are expanded through heating during the manufacturing process. The microspheres are non-friable, compressible, and flexible. Test data shows that these microspheres do not meet the definition for a Division 4.1 (flammable solid), and that the material is not combustible. The calcium carbonate coating distinguishes Dualite® products from unexpanded and uncoated polymeric microspheres by eliminating the flame spread and dust explosion hazards.
>
> The Dualite® products would be shipped in a sealed liner, inside a fiberboard box (4'X2'X2'). During transportation a small amount of flammable gas may be released, but would not create a flammable mixture with air, and thus would not be forbidden in accordance with § 173.21. The solid Dualite® material would also not represent a flame spread/flammability hazard.

You stated that because the HMR does not define the term "expandable", except that information in *italics* in the description specifies that such material produces "evolving flammable vapor," it is unclear as to whether Sovereign's Dualite® products (i.e., ones that have been expanded, but some of which theoretically undergo additional expansion) fall within the description "Polymeric beads, expandable, Class 9, UN 2211, III," in the § 172.101 Hazardous Materials Table (§ 172.101 HMT).

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172.101

The test data provided indicates that certain of Sovereign's Dualite® products do not meet the definition in § 173.124 for a Division 4.1 (flammable solid) material, and if they do not meet any other hazard class definitions in Part 173, such products would not be subject to the HMR. However, the test data does indicate that certain of these products (e.g., Micropearl , F46D1, F80SD1, and F82D) do meet the Division 4.1 (flammable solid) definition in § 173.124, and are subject to the HMR and regulated for purposes of transportation in commerce.

In regards to a material described as "Polymeric beads, expandable, Class 9, UN 2211, III," in the § 172.101 HMT, a "miscellaneous hazardous material" (Class 9), as defined in § 173.140, is a material which presents a hazard during transportation but which does not meet the definition of any other hazard class. This includes: (1) Any material which has an anesthetic, noxious or other similar property which could cause extreme annoyance or discomfort to a flight crew member so as to prevent correct performance of assigned duties; or (2) Any material that is a hazardous substance, hazardous waste, or marine pollutant as defined in § 171.8.

The microspheres most likely will meet the definition and description "Polymeric beads, expandable, Class 9, UN 2211, III" despite the word "Expandable". To get out of this entry, Sovereign needs to evaluate whether their material or product could evolve flammable gas. One way to evaluate is to conduct a "head space" test to see whether under certain transport conditions, "flammable atmosphere" can be created.

I hope this information is helpful. If we can be of further assistance, please contact us.

Sincerely,

Delmer F. Billings
Chief, Standards Development
Office of Hazardous Materials Standards

KELLER AND HECKMAN LLP
SERVING BUSINESS THROUGH LAW AND SCIENCE®

1001 G STREET, N. W.
SUITE 500 WEST
WASHINGTON, D.C. 20001
TEL. 202.434.4100
FAX 202.434.4646
WWW.KHLAW.COM

WRITER'S DIRECT ACCESS

Michael F. Morrone
(202) 434-4124
morrone@khlaw.com

Engrum
§172.101
Applicability
02-0305

November 22, 2002

Research and Special Programs Administration
Office of Hazardous Materials Standards (DHM-10)
U.S. Department of Transportation
400 Seventh Street, S.W.
Washington, D.C. 20590-0001

Re: Request for Clarification – Dualite® Microsphere Products

Dear Sir or Madam:

Our client, Sovereign Speciality Chemicals, Inc. (Sovereign), manufactures expanded polymeric microspheres that are coated with calcium carbonate for use in a wide variety of applications, including automobile coatings, sporting equipment, and building materials. These microspheres, marketed as Dualite®, contain small quantities of propane, isopentane, and/or isobutane. The purpose of this letter is to request clarification of the applicability of the U.S. Department of Transportation's (DOT's) hazardous materials regulations to the shipment of Sovereign's Dualite® products. More specifically, we are requesting confirmation that these products do not fit within the listing for "Polymeric beads, expandable," UN 2211, found in 49 C.F.R § 172.101 and are not otherwise subject to regulation under the DOT hazardous materials regulations.[1]

Sovereign's Dualite® products consist of flexible, ultra-low density thermoplastic hollow microsphere cores that have been filled with gas (*i.e.*, approximately 1.5 percent by weight of propane, isopentane, and/or isobutane) and surface coated with calcium carbonate. During the manufacturing process, these microspheres are "expanded" through heating. The microspheres

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[1] We discussed this issue with Ms. Hattie Mitchell of DOT's Office of Hazardous Materials Standards during a recent telephone conversation regarding various classification issues. After conferring with members of DOT's scientific staff, Ms. Mitchell suggested that because the referenced listing was vague, DOT would need to review a formal request for written clarification on the matter prior to offering any formal guidance on the applicability of the referenced shipping name to the product in question. Ms. Mitchell did report, however, that it would not be unreasonable to expect that DOT might agree that the material may be shipped as a non-hazmat if it were packaged in airtight containers, assuming that the concentrations of gas are as low as reported. To confirm a determination that the material is not subject to regulation as a hazmat, we are submitting this letter.

are non-friable, compressible, and flexible. They are resilient and impart a variety of valuable properties to end-use products, such as reduced weight and lower volatile organic compound (VOC) emissions.

Based on test data and knowledge regarding the properties of the calcium carbonate coated microspheres that comprise the Dualite® products, Sovereign believes that these materials do not fit within any of the DOT-specified hazard classes. In particular, the material does not meet the definition of a Division 4.1 flammable solid as verified by burn rate testing. Furthermore, Sovereign has commissioned testing of Dualite® using the Hartman Dust Explosibility method and has found that the material is a non-combustible dust. The unique, and patented, calcium carbonate coating distinguishes Dualite® from unexpanded and uncoated polymeric microspheres by eliminating the flame spread and dust explosion hazards. Less clear is whether the material should be shipped as Class 9, "Polymeric beads, expandable." Because the DOT regulations fail to define the term "expandable," other than by including the phrase "evolving flammable vapor" with the corresponding listing, we are unclear as to whether microspheres, such as those that comprise the Dualite® products (*i.e.*, ones that have been expanded, but some of which could theoretically undergo additional expansion), fall within the aforementioned listing and require shipment as a Class 9 material.

Although the precise scope of the "Polymeric beads, expandable" listing is unclear under the DOT's hazardous materials regulatory regime, the International Maritime Dangerous Goods Code (IMDG Code) clarifies that the "Polymeric beads, expandable" name applies to materials that contain 5 to 8 percent of a volatile hydrocarbon that is predominantly pentane, and that release a small proportion of pentane to the atmosphere during storage. The Dualite® calcium carbonate coated microspheres have already been expanded, and they contain only approximately 1.5 percent by weight of volatile hydrocarbons (isobutene, isopentane, and/or propane, as compared to pentane), well below the 5 to 8 percent range described in the IMDG Code.

Sovereign desires to ship the Dualite® products in a sealed liner, inside a fiberboard box (approximately 4 ft. x 2 ft. x 2 ft.). Due to the low volatile hydrocarbon content of the material and using the IMDG Code definition as a reference, Sovereign believes that its Dualite® products are not subject to regulation as Class 9 or any other hazard class material under the DOT hazardous materials regulations. Although there is the potential that a small quantity of flammable gas may be released from the material during the course of a particular shipment, we believe that given the small amount of flammable gas present in the microspheres, the quantity released would be so small that it would not create a flammable mixture with air, and as a result, would not be forbidden from transport by 49 C.F.R. § 173.21(g). In addition, and unlike unexpanded polymeric microspheres, the solid Dualite® material would not represent a flame spread /flammability hazard.

Please advise whether you agree that Sovereign's Dualite products, as described, are not subject to regulation as a Class 9 or any other hazard class material. Should you have any questions or require further information, please do not hesitate to contact us. We look forward to receiving your response as soon as possible, so that Sovereign and its customers may ship these products accordingly.

Sincerely,

Michael F. Morrone