



DEPARTMENT OF TRANSPORTATION
HAZARDOUS MATERIALS REGULATIONS BOARD
WASHINGTON, D.C. 20590

25235

[49 CFR Parts 172, 173]

[Docket No. HM-118; Notice No. 74-9]

**EXPANDABLE POLYSTYRENE RESIN AND
THE DEFINITION OF A FLAMMABLE
SOLID**

Notice of Proposed Rule Making

The Hazardous Materials Regulations Board ("the Board") of the Department of Transportation proposes to (1) amend Part 172 of the Hazardous Materials Regulations to specify that expandable polystyrene containing either a flammable liquid or flammable gas is classed as a flammable solid and (2) amend the definition of a flammable solid in § 173.150.

By letter dated January 8, 1954, the Chief Inspector, Bureau of Explosives, Association of American Railroads, expressed his view that expandable polystyrene is not classed as a "dangerous article under the I.C.C. Regulations; since it does not fall within the scope of any of the definitions contained therein." He went on to state that, "Any hazard which the material might have will be minimized by the use of tight containers, and any containers which will satisfactorily prevent the escape of vapors under normal conditions will be acceptable."

The Board agrees with the letter statement expressed above. However, the Board believes the statement is also applicable to thousands of other materials presently subject to the Department's regulations. Also, the statement had no binding effect since the Chief Inspector had stated earlier that it was his view that the material was not classed as a "dangerous article." The situation here is the same as that mentioned in the preamble of the Notice to Docket HM-102 (37 FR 11898) stating that a material must be classed as a hazardous material before it may be made the object of regulatory requirements.

The opinion of the Chief Inspector was not challenged until 1973 when the Department took the position that the expandable polystyrene shipped by one manufacturer was classed as a flammable solid, n.o.s. That particular manufacturer has petitioned the Board for a special permit for certain packaging waivers. Since receipt of the petition, the Board has been contacted by several manufacturers of expandable polystyrene presenting different views on how the material should be handled under the regulations. The Board believes this matter should be handled by a public rule making procedure being fully aware that millions of pounds of this material are shipped annually and that the definition set forth in § 173.150, when literally construed, may not address the potential hazard of expandable polystyrene.

According to information available to the Board, pentane is the most common glowing (expanding) agent in the expandable polystyrene shipped at the present time. Pentane has a flash point of minus 40°F. or lower, is flammable when mixed with air at 1.5 to 7.8 percent by volume, and is 2½ times heavier than

air. The percentage of pentane in expandable polystyrene is usually 5 to 8 percent by weight. Open burning tests have been conducted on expandable polystyrene, and the Board takes no issue with the conclusion that the material does not burn so vigorously and persistently as to create a serious transportation hazard. However, the Board does believe the material poses a potential hazard in transportation due to the possible emission of pentane (or other flammable material) vapors into confined areas. The Board believes the material should be classed as a flammable solid so that the potential hazard will be communicated by labeling and placarding, and appropriate packagings specified.

By letter dated April 12, 1974, the Assistant General Counsel to the Society of the Plastics Industry, Inc. (SPI) stated the following:

Initially, we wish to observe that any regulation adopted by the Department with respect to this material should be limited to *expandable* polystyrene resin. The designation "expandable" signifies that resin into which pentane has been introduced, the presence of which generates the interest of the Department of Transportation in regulating this commodity. Additionally, "resin" is preferable to "beads" for purposes of identification in the Department's regulations.

As we discussed, the members of SPI have transported hundreds of millions of pounds of expandable polystyrene resins during a period of more than a decade without incurring a single reported incident of fire or explosion. Any danger which does exist is the result of the accumulation of pentane gas which bleeds from the resins and leaks from the container into an enclosed environment which lacks ventilation. Any such danger can thus be alleviated by adequate venting during storage/transit or prior to unloading and further by a ban upon exposure to open flame or lighted cigarettes. Once any accumulated gas has thus been dissipated, the resin itself cannot be considered to be a flammable solid within the definition of 49 C.F.R. § 173.150. Identification of the resin as a flammable solid is thus a misnomer and further fails to adequately identify the hazard presented.

It is the recommendation of SPI and its members that the Department of Transportation not require expandable polystyrene resin to be identified as a flammable solid but rather that a specific rule section be adopted which (1) prohibits transportation of this material in refrigerator-type equipment, and (2) requires the shipper to provide warning identification labels to be applied to the transportation equipment advising of the requirement to ventilate that equipment for a period of ten minutes before unloading and further advising of a prohibition upon smoking or open flame in the vicinity of such equipment. Such notification, will, we respectfully submit, give adequate warning of the minor hazard which may be presented by this commodity.

Concerning the first paragraph quoted above, the Board agrees to use the word "resin" in place of the word "beads" but is proposing that the word "polystyrene" appear first as the key word for alphabetical listing in § 172.5. Concerning the statement in the second quoted paragraph about the excellent experience in

shipping this material to the present time, the Board has no information to the contrary and the accident experience, or lack of experience, involving this material (which is not presently the subject of the Department's incident reporting requirements) is not the basis for this rule making action.

Concerning the recommendation that expandable polystyrene resin not be classed as a flammable solid, the Board does not agree for the reason stated earlier in this preamble, a material must be classed as a hazardous material before it may be made the object of regulatory requirements. Further, the suggested prohibition against the use of refrigerated equipment raises the question as to what other types of semi-airtight equipment should be considered or whether ventilation equipment should be specified and what type of criteria utilized. Furthermore, if this approach is followed, it may be necessary to examine the criteria pertaining to the transportation of all materials capable of emission of flammable vapors. The Board believes such an undertaking would be considerable in scope and length. The Board also takes the same view pertaining to special markings to be applied to transport vehicles. If such markings are specified when expandable polystyrene resin is transported, perhaps they should also be considered for other materials if the present **FLAMMABLE** (for highway) **DANGEROUS** (for rail) placards, or those proposed in Docket HM-103 (39 FR 3164) are considered to be insufficient in communicating the potential hazards of flammable materials in transportation. The Board does not agree with the alternatives suggested by SPI at this time but will consider carefully all views presented before deciding on a future course of action.

The Board believes the definitions in the regulations for each of the classifications should be specified in quantitative terms when it is practicable and feasible to do so. Its efforts to date have not been easy (e.g., Docket HM-57 for corrosive materials). However, there are situations when exclusive reliance upon

quantitative definitions could preclude the regulation of materials, such as polystyrene resin, that should be made the subject of safety requirements. If the Board is to carry out its assigned responsibilities in an adequate manner, there should be sufficient flexibility provided in its regulations to enable the Department to regulate materials that pose a potential hazard in transportation. Therefore, the Board is proposing to amend § 173.150 by adding a reference to § 172.5 in order to classify as flammable solid materials that present potential hazards associated with other substances in the flammable solid class. Additions to the list in § 172.5 would be made in accordance with the rulemaking procedures specified in 49 CFR Part 170. This same procedure is presently used by the U.S. Coast Guard to identify materials as "Hazardous articles" under 46 CFR 146.27-1.

Concerning packaging, the Board will consider recommendations for packagings presently used that are not provided for in § 173.154.

With respect to the proposal made in Docket HM-112, Notice 73-9 (39 FR 3021) regarding § 172.101, under the description "polystyrene beads," that proposal remains effective insofar as it pertains to the Hazard Information Number assignment, the passenger-carrying rail car and aircraft limitations, and the vessel stowage requirements. Otherwise, that proposal is modified as presented in this notice.

In consideration of the foregoing, the Hazardous Materials Regulations Board proposes to amend Part 172 and Part 173 of 49 CFR as follows:

PART 172—LIST OF HAZARDOUS MATERIALS CONTAINING THE SHIPPING NAME OR DESCRIPTION OF ALL MATERIALS SUBJECT TO PARTS 170-189 OF THIS SUBCHAPTER

In § 172.5 paragraph (a), the List of Hazardous Materials would be amended as follows:

§ 172.5 List of hazardous materials.
(a) * * *

Article	Classed as—	Exemptions and packing (see sec.)	Label required if not exempt	Maximum quantity in 1 outside container by rail express
(add)				
Polystyrene resin, expandable, containing a flammable liquid or gas.	F.S.	173.153, 173.154	F.S.	25 lbs.

PART 173—SHIPPERS

In § 173.150, paragraph (a) would be amended to read as follows:

§ 173.150 Flammable solid; definition.

For the purposes of Parts 170-189 of this subchapter, a flammable solid is any

material listed by specific name and classed as a flammable solid in § 172.5 of this subchapter, or is any other solid material (except a solid material classed as an explosive) which, under conditions incident to transportation, is liable to cause fires through friction, absorption

of moisture, spontaneous chemical changes, retained heat from manufacturing or processing, or which can be ignited readily and when ignited burns so vigorously and persistently as to create a serious transportation hazard. Examples: Certain metallic hydrides, metallic sodium and potassium, and certain oily fabrics, processed meals, and nitrocellulose products.

Interested persons are invited to give their views on these proposals. Communications should identify the docket number and be submitted in duplicate to the Secretary, Hazardous Materials Regulations, Board, Department of Transportation, Washington, D.C. 20590. Communications received on or before September 24, 1974 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 the Secretary, Hazardous Materials Regulations Board, room 6215, Trans Point Building, Second and V Streets, SW., Washington, D.C., both before and after the closing date for comments.

(Transportation of Explosives Act, (18 U.S.C. 831-835), section 8 of the Department of Transportation Act (49 U.S.C. 1655); Title VI and section 902(h) of the Federal Aviation Act of 1958, (49 U.S.C. 1421-1430, 1472 (h), and 1655(c))

Issued in Washington, D.C. on July 2, 1974.

W. J. BURNS,
Director.

Office of Hazardous Materials.

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