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Fiber Drum Packaging for Transporting Liquid Hazardous Materials

National Research Council, Transportation Research Board, March 1997

A major change in U.S. hazardous materials regulations occurred in 1990, when the U.S. Department of Transportation (DOT)-following the recommendations of the United Nations Committee of Experts on the Transport of Dangerous Goods-revised its standard for nonbulk packaging in line with regulations adopted by Canada, Australia, and the member nations of the European Union. In addition to facilitating international commerce, the changes embodied in the new HM-181 packaging standard are intended to increase safety in the transport of hazardous materials in response to growing public awareness and environmental concerns. The continued use of open-head fiber drums for certain classes of hazardous liquids has been the subject of discussions between DOT and the fiber drum industry since the early 1980s, when DOT first proposed revisions to the hazardous materials regulations, including the phase-out of existing open-head fiber drum packaging for hazardous liquids. The liquids in question include cleaning solvents, adhesives, and textile-treating compounds. The Secretary of Transportation is to issue final regulations regarding the use of open-head fiber drums for transporting hazardous liquids by September 30, 1997.

In the ICC Sunset Act of 1995 [P.L. 104-88, Sec. 406(c)], Congress requested a study by the National Academy of Sciences to determine (a) whether fiber drums with a removable head meet statutory requirements for safe transportation of hazardous liquids, and (b) whether alternative packaging standards, such as those proposed by the fiber drum industry, provide a level of safety equal to or greater than that provided by HM-181. The study was conducted through the National Research Council (NRC), which serves as the operating arm of the National Academies of Sciences and Engineering. To conduct the study, the Transportation Research Board of the NRC convened a committee of 13 members with expertise in hazardous materials transportation, data analysis, packaging, and testing (committee roster below).

In its report, the committee concludes that DOT should not extend an existing authorization to ship hazardous liquids in open-head fiber drums that do not pass performance tests defined in HM-181. An alternative set of tests proposed by the fiber drum industry does not provide the same assurance as the HM-181 federal packaging standard that a package can survive the rigors of transport without releasing some or all of its contents. In addition, available data are not sufficiently complete, reliable, and current to determine with an acceptable degree of confidence that hazardous liquids can be safely transported in open-head fiber drums.

The committee's report, *Fiber Drum Packaging for Transporting Liquid Hazardous Materials*, urges DOT and industry to correct the deficiencies in DOT's data base of information on releases of hazardous materials resulting from packaging failures during shipment. More complete and reliable information is needed to assess future changes to or possible exemptions from HM-181. The committee notes that a sizable proportion of all releases of hazardous materials from fiber, steel, and plastic drums occur when a drum is punctured, often by the blades of a forklift or by a protruding nail or screw. The committee

therefore recommends that DOT consider adding a puncture test to its HM-181 packaging standard in an effort to reduce the numbers of such incidents.

Funds for this study were provided by the U.S. Department of Transportation, Research and Special Programs Administration. Copies of the report may be purchased from the Transportation Research Board Business Office, telephone (202) 334-3214.

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