



DEPARTMENT OF TRANSPORTATION
MATERIALS TRANSPORTATION BUREAU
WASHINGTON, D.C. 20590

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Title 49—Transportation
CHAPTER I—MATERIALS
TRANSPORTATION BUREAU

SUBCHAPTER C—HAZARDOUS MATERIALS
REGULATIONS BOARD

[Docket No. HM 110; Amdt. 177-34]

PART 177—SHIPMENTS MADE BY WAY
OF COMMON, CONTRACT, OR PRIVATE
CARRIERS, BY PUBLIC HIGHWAY

Use of Catalytic Heaters

The purpose of this amendment to Part 177 of the Hazardous Materials Regulations is to permit the use of catalytic heaters in motor vehicle cargo compartments during the transportation of flammable liquid or flammable gas.

On May 16, 1975, the Hazardous Materials Regulations Board published a notice of proposed rulemaking, Docket No. HM-110; Notice No. 75-5 (40 FR 21485), which proposed this amendment. It proposed:

(1) To establish a maximum allowable temperature of 130° F. (54° C.) for all surfaces of the heater which might contact the cargo of flammable liquid or gas;

(2) To require installation of a guard on a heater to prevent the hazardous material cargo from being closer than 12 inches (30.5 cm) to the heater, as a means of preventing exposure of the cargo to more than 130° F. (54° C.);

(3) To prohibit heater ignition before the vehicle is loaded;

(4) To prohibit flame, either in the catalyst or in any part of the heater, and to require that notice to this effect be marked on the heater;

(5) To require the use of a heater that has been certified by the manufacturer that the heater meets all the Department's requirements by properly marking the heater with the certification; and

(6) To clarify the restrictions on the use of automatic cargo-space-heating temperature control equipment with explosives or flammable liquid and gas.

Interested persons were invited to give their views on these proposals. Of the comments received, no objection was made to the proposals as outlined in items (3), (4), and (6) above. Rewording these proposals in this amendment clarifies, rather than changes, substance.

There was one comment, a significant one, regarding the manufacturer's certification-marking requirement. As proposed, the wording was so similar to marking requirements under the Federal Motor Carrier Safety Regulations that confusion, threatening a compromise of safety, was fostered. Consequently, the certification-marking language for catalytic heaters is changed.

All other comments addressed the proposed maximum allowable temperature and guard requirements.

Several commenters objected that the requirement to install a heater guard was unnecessary in view of the proposed maximum temperature standard and the high cost resulting from installation, retrofitting, and revenue producing cargo space.

There was no significant objection to approaching the problem of assuring safety in the use of catalytic heaters by establishing

a maximum temperature for heater surfaces. Nor was there any significant objection to establishing 130° F. (54° C.) as the standard. One objection, based upon the premise that a higher maximum was proper, was withdrawn after close examination.

The Materials Transportation Bureau, which is now vested with the authority to issue hazardous materials regulations, concluded that assuring safety in the use of catalytic cargo heaters for transporting flammable liquid or gas is properly approached by establishing a maximum allowable temperature for heater surfaces of 130° F. (54° C.). It was further concluded that the use of a 12 inch heater guard, as the means of keeping heater surface temperatures within the temperature standard, is not required.

In support of these conclusions, the evidence indicated the following:

(1) 130° F. (54° C.) is the maximum temperature at which human skin may be subjected for short duration without causing non-reversible tissue damage. See, for example, the Calspan Corporation's study for the Consumer Products Safety Commission, entitled, "Investigation of Safety Standards for Flame-fired Furnaces, Hot-Water Heaters, Clothes Dryers and Ranges."

(2) 130° F. (54° C.) permits a wide and comfortable safety factor before auto-ignition occurs with properly packaged flammable liquid and gas that is listed under 49 CFR 172.5 as hazardous material.

(3) Two of the major manufacturers of commercial catalytic heaters came forth to assure the Bureau that heaters may be readily designed to operate within the 130° F. (54° C.) maximum, in an outside or ambient temperature range beyond which there is no reasonable expectation to find a heater in operation.

(4) It is reasonable to expect that a heater would not be operated when the outside or ambient temperature is above 60° F. (16.6° C.).

(5) Heaters with 12 inch-guards, if the guards were installed on some of the heaters currently available, could reach a surface temperature as high and as dangerous as 284° F. (140° C.).

In consideration of the foregoing, 49 CFR 177.834(1) is amended to read as follows:

§ 177.834 General requirements.

(1) Use of cargo heaters when transporting certain hazardous material. Transportation includes loading, carrying, and unloading.

(1) When transporting explosives. A motor vehicle equipped with a cargo heater of any type may transport explosives only if the cargo heater is rendered inoperable by: (i) Draining or removing the cargo heater fuel tank; and (ii) disconnecting the heater's power source.

(2) When transporting certain flammable material—(1) Use of combustion cargo heaters. A motor vehicle equipped with a combustion cargo heater may be used to transport flammable liquid or flammable gas only if each of the following requirements are met—

(A) It is a catalytic heater.
(B) The heater's surface temperature cannot exceed 130° F. (54° C.)—either on a thermostatically controlled heater or on a heater without thermostatic control when the outside or ambient temperature is 60° F. (15.6° C.) or less.
(C) The heater is not ignited in a loaded vehicle.

(D) There is no flame, either on the catalyst or anywhere in the heater.

(E) The manufacturer has certified that the heater meets the requirements under paragraph (1)(2)(i) of this section by permanently marking the heater "MEETS DOT REQUIREMENTS FOR CATALYTIC HEATERS USED WITH FLAMMABLE LIQUID AND GAS."

(F) The heater is also marked "DO NOT LOAD INTO OR USE IN CARGO COMPARTMENTS CONTAINING FLAMMABLE LIQUID OR GAS IF FLAME IS VISIBLE ON CATALYST OR IN HEATER."

(G) Heater requirements under § 393.77 of this title are complied with.

(1) Effective date for combustion heater requirements. The requirements under paragraph (1)(2)(i) of this section govern as follows—

(A) Use of a heater manufactured after November 14, 1975, is governed by every requirement under (1)(2)(i) of this section;

(B) Use of a heater manufactured before November 15, 1975, is governed only by the requirements under (1)(2)(i)(A), (C), (D), (F) and (G) of this section until October 1, 1976; and

(C) Use of any heater after September 30, 1976, is governed by every requirement under (1)(2)(i) of this section.

(iii) Restrictions on automatic cargo-space-heating temperature control devices. Restrictions on these devices have two dimensions: restrictions upon use and restrictions which apply when the device must not be used.

(A) Use restrictions. An automatic cargo-space-heating temperature control device may be used when transporting flammable liquid or flammable gas only if each of the following requirements is met—

(1) Electrical apparatus in the cargo compartment is nonsparking or explosion proof.

(2) There is no combustion apparatus in the cargo compartment.

(3) There is no connection for return of air from the cargo compartment to the combustion apparatus.

(4) The heating system will not heat any part of the cargo to more than 130° F. (54° C.).

(5) Heater requirements under § 393.77 of this title are complied with.

(B) Protection against use. Flammable liquid or flammable gas may be transported by a vehicle, which is equipped with an automatic cargo-space-heating temperature control device that does not meet each requirement of paragraph (1)(2)(iii)(A) of this section, only if the device is first rendered inoperable, as follows—

(1) Each cargo heater fuel tank, if other than LPG, must be emptied or removed.

(2) Each LPG fuel tank for automatic temperature control equipment must have its discharge valve closed and its fuel feed line disconnected.

Effective date. This amendment is effective October 1, 1975.

(Transportation of Explosives Act (18 U.S.C. 831-835); Sec. 6 Department of Transportation Act (49 U.S.C. 1655); 49 CFR 1.64(g)).

Issued in Washington, D.C., on October 1, 1975.

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