Designation: D 6268 – 98

An American National Standard

Standard Practice for Handling, Transportation, and Storage of HFC-125, Pentafluoroethane (C_2HF_5)[1]

This standard is issued under the fixed designation D 6268; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers guidance and direction to suppliers, purchasers, and users in the handling, transportation, and storage of HFC-125, pentafluoroethane (C_2HF_5).

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 6231 Specification for HFC-125, Pentafluoroethane (C_2HF_5)[2]

2.2 *CGA Standards:*[3]

C-1 Methods for Hydrostatic Testing of Compressed Gas Cylinders

C-4 American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained

C-6 Standards for Visual Inspection of Steel Compressed Gas Cylinders

P-1 Safe Handling of Compressed Gases in Containers

SB-1 Hazards of Refilling Compressed Refrigerant (Halogenated Hydrocarbon) Gas Cylinders

2.3 *U.S. Government Standards:*[4]

Code of Federal Regulations (CFR) Title 49, Part 82.106

Code of Federal Regulations (CFR) Title 49, Part 173, U.S. Department of Transportation (DOT) Specifications, Shippers-General Requirements for Shipping and Packagings

Code of Federal Regulations (CFR) Title 49, Part 178, U.S. DOT Specifications for Packagings

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *containers*—storage vessel for HFC-125.

3.1.2 *cylinders*—containers of HFC-125.

3.1.3 *HFC-125*—pentafluoroethane, a compound used to inert or suppress a fire or explosion hazard.

3.1.4 *insulated*—placed in an isolated situation to protect and prevent the transfer of damage.

4. Significance and Use

4.1 This practice provides requirements for the handling, transportation, and storage of HFC-125 encountered in distribution through both commercial and military channels. It is intended to insure that HFC-125 is handled, transported, and stored in such a way its physical properties are not degraded. Transport may be by various means, such as, but not limited to, highway, rail, water, and air.

5. Practice

5.1 Personnel shall be trained in Title 49 CFR, Part 172, Subpart H, to ensure safe handling, loading, unloading, storage and transportation of material.

5.2 *Handling*:

5.2.1 Handling shall be in accordance with CGA P-1.

5.2.2 Personnel who handle or store, or both, cylinders of HFC-125 shall be trained properly to recognize and identify the characteristics of the product and the proper methods of safely handling full, partly full, and empty cylinders.

5.2.3 Facility personnel must be trained in applicable Title 49 CFR, Parts 173 and 178, and the CGA documents referenced in 2.2.

5.2.4 HFC-125 handling shall be in nonsmoking, heater-free, ventilated areas to preclude product accumulation. Provisions shall be made to ensure that service areas limit HFC-125 concentrations to not exceed 7.5 % for 1 min and 0.1 % for 8 h.

5.2.5 Cylinders shall not be overfilled. The maximum permitted filling density shall be 945 kg/m^3 (59 lb/ft^3). The liquid portion of the liquefied gases must not completely fill the container's internal volume at any temperature up to and including 54°C (130°F). Filling density requirement are specified in Title 49 CFR, 173 and Title 49 CFR, 173.305.

5.2.6 Handling of materials should be done in a manner that

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[1] This practice is under the jurisdiction of ASTM Committee D26 on Halogenated Organic Solvents and Fire-Extinguishing Agents and is the direct responsibility of Subcommittee D26.09 on Halogenated Fire Extinguishants.

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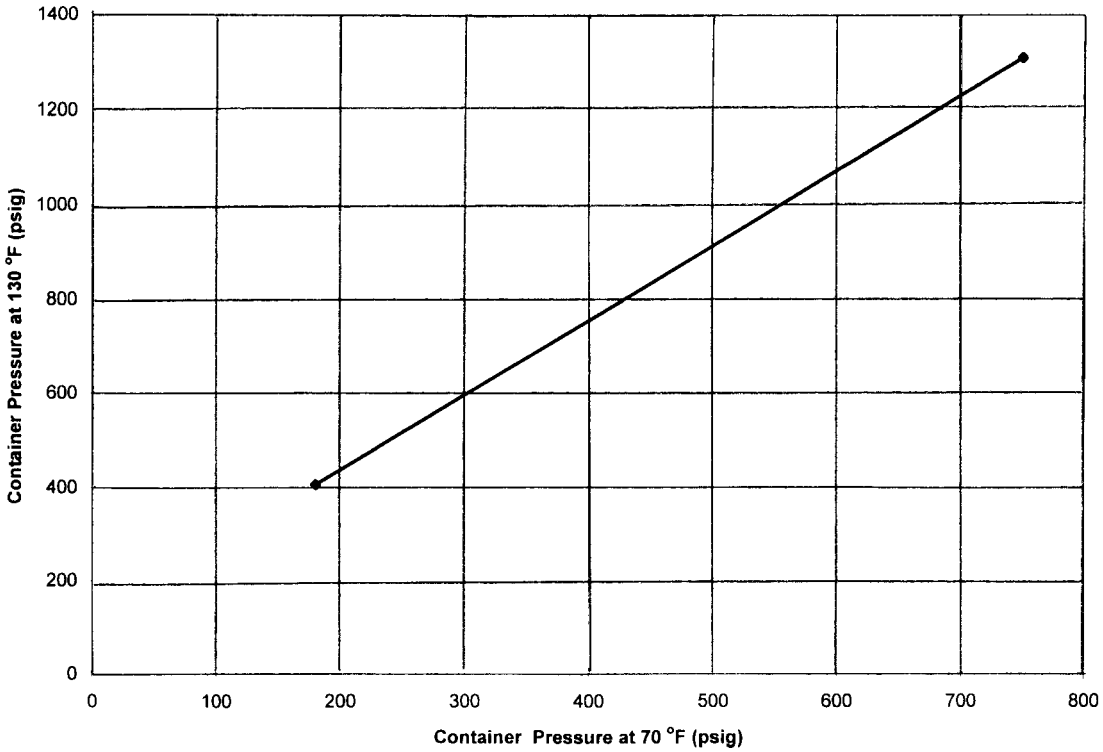
[2] *Annual Book of ASTM Standards*, Vol

[3] Available from the Compressed Gas Association.

[4] Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20036.



NOTE 1—Applicable to a container fill density of 57.5 lb/ft^3 only.

FIG. 1 Effect of Temperature on Storage Cylinder Pressure (HFC-125 Mixed with Nitrogen)

prevents contamination or co-mingling of materials other than HFC-125.

5.2.7 Cylinders shall be free of dirt and contamination that would contribute to or would cause deterioration of the product during shipment or storage. Precautions should be taken to prevent the entry of oil, water, or any other foreign matter into the container. Unique coatings or preservatives applied prior to shipment to protect the containers are not considered contamination.

5.3 *Transportation*:

5.3.1 Transportation shall be as specified in accordance with DOT regulations of Title 49 CFR.

5.3.2 Transportation shall be in suitable vehicles to preclude cylinder damage by excessive mechanical vibration, shock, freezing, or deleterious high temperatures throughout the entire transport route.

5.3.2.1 If cylinders are expected to be subject to unacceptable transport conditions, the cylinders should be placed under insulated conditions.

5.3.3 Compressed gas cylinder permanent marking requirements shall be as specified under Part 178 of Title 49 CFR and must be maintained in legible condition as required by Part 173 of Title 49 CFR. Warning labels shall be affixed to the cylinders conforming to requirements of Part 82.106 of Title 40 CFR.

5.4 *Storage*:

5.4.1 Storage shall be in accordance with CGA P-1, in qualified cylinders in accordance with Parts 173 and 178 of Title 49 CFR.

5.4.2 Cylinders should be stored in areas that will protect vessels from physical and environmental damage, and tampering from unauthorized personnel.

5.4.2.1 Facilities should be in constructed and oriented so that safety requirements are fulfilled for storage of pressurized cylinders.

5.4.3 Storage cylinders shall be fitted with pressure release mechanisms to limit vessel pressure to not more than the rated working pressure of the container in use at any particular time.

5.4.3.1 Periodic hydrostatic testing and re-inspection of cylinders used for HFC-125 shall comply with Part 173.34 of Title 49 CFR.

5.4.4 Containers shall be clearly marked and labeled to identify whether the HFC-125 contained conforms to Specification D 6231.

5.4.5 Insulation shall be placed on pallets or shoring and provisions should be made to prevent excessive shock or thermal fluctuations to cylinders.

5.4.6 Cylinders shall be stored in a manner that will prevent contamination from external sources.

6. Keywords

6.1 HFC-125; Pentafluoroethane; C_2HF_5; compressed gas; compressed liquefied gas; cylinders; explosion suppressant; fire suppressant; handling; storage; transport