



PSI, F.Y.I.

Engineering... Training... and YOU

HAZARDOUS MATERIALS TRANSPORTATION & HANDLING

Headlines:

- US Department of Transportation Definitions
- Cylinder Handling
- Shipping Papers
- DOT Cylinder Transportation Requirements
- Compressed Gas Transportation Guidelines
- Placarding

US Department of Transportation Definitions

Class 2: Gases: Oxygen, Flammable and Non-flammable Compressed Gas



DOT Division 2.2 includes: Non-flammable gases such as aerosols, CO2, refrigerants (HFC-125, HFC-227ea,

Novoc1230, IG-541, etc.), helium, nitrogen, oxygen.

DOT Division 2.2 also includes:

TRADE NAME	ASHRAE DESIGNATION
FM-200	HFC-227EA
E-CARO	HFC-125
NOVEC/SAPPHIRE	FK-5-1-12
ARGONITE/PRO-INERT	IG-55
NITROGEN	IG-541
FE-36	HFC-236

A material or mixture that exerts in the packaging an absolute pressure of 40.6psi or greater at 20°C and does not meet the definition of Division 2.1 or 2.3.

This includes compressed gas, liquefied gas, pressurized cryogenic gas, compressed gas in solution, asphyxiant gas and oxidizing gas.

Cylinder Handling

Compressed Gas Cylinder Handling

- Roll cylinders on their bottom edge for short distances only. Dragging or sliding cylinders can damage them.
- Do not lift a cylinder by the protective cap.
- Use personal protective equipment, such as side-shield glasses, gloves, and safety shoes, when handling containers.
- Avoid skin contact with liquid as it can cause frostbite.
- Never use a magnet or sling to lift containers. Lifting may be accomplished by the use of a safe cradle or platform basket that holds the container.
- Protect containers from any objects that will result in a cut or other abrasion in the surface of the metal.
- Never tamper with the safety devices in the valves or containers.
- Never attempt to repair or alter container or valves.
- Never force connections that do not fit. Make sure the threads on the regulator or other auxiliary equipment are the same as those on the valve outlets.
- Keep valves tightly closed, with the valve caps and hoods in place when the container is not in use.

Upcoming Events!

- Electrical Standards, Orlando, 2 Sept. 2011
- PSI Suppression Training, S. Florida, 29-30 Sept. 2011

Shipping Papers

Shipping Papers which fully identify the hazards involved must accompany the shipment.

The following is a brief outline of information typically required for transportation of Class 2.2 compressed gas cylinders. Please refer to the Department of Transportation

CFR 49, Part 172-173 for a complete list of requirements.

Shipping Records must contain:

- Emergency response information (name and phone number)
- Name, Signature and

Date of person responsible for visually inspecting and accepting the material for transportation.

- Number of cylinders
- Hazard Material identification: "X" for standard

Class 2.2 shipments "RQ" required for recordable quantities of hazardous materials (not applicable to Class 2.2 materials)

- DOT/ ICC specification or exemption number
- Hazard classification
- Total quantity of hazardous material
- Shipping from information

Shipping papers for other hazardous materials, other than hazardous waste, must be kept for two years.

Shipping papers must be within immediate reach of driver while restrained by a seatbelt or in a holder on the driver's door.

SHIPPING PAPER			
TO:	Protective Systems, Inc. 1719 NW 79th Avenue Doral, FL 33126	FROM:	Protective Systems, Inc. 920 Britt Ct. #248 Altamonte Springs, FL 32701
QTY.	HM.	DESCRIPTION	WEIGHT
1 cyl.	X	UN3296, Heptafluoropropane, Class 2.2	311 lbs.
This is to certify that the above named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.			
Accepted:			
Signed:			
Dated:			
SPECIAL INSTRUCTIONS: 24Hr. Emergency Contact, Mr. John Doe 407-555-1212			

DOT Cylinder Transportation Requirements

Transportation of DOT Division 2.2 hazardous materials less than 220lbs. are considered "MOT" (Materials of Trade).

- No significant requirements at this level.

Transportation of DOT Division 2.2 hazardous materials over 220lbs require strict adherence to DOT standards for transporting hazardous materials for commerce.

- Shipping papers

- Placards on vehicles when transporting 1001lbs. or more.

Filled tanks MAY be transported after their required retest date.

Cylinders must be loaded into a vehicle such that "motion of the containers relative to each other and relative to the transporting vehicle is prevented."

- *Lashed securely in an upright position*

- *Loaded into racks securely fastened to the vehicle*
- *Packed in boxes or crates*

Tank in its mounting bracket must have a shipping cap and anti-recoil device installed.

- Required venting is provided through (2) 180° and (4) 90° exhaust ports on the recoil cap.

Please refer to the Department of Transportation

CFR 49, Part 172-173 for a complete list of requirements.

DOT CFR49, PART 172-173 IS AVAILABLE IN THE FOLLOWING LOCATIONS:

- ORLANDO
ENG. DEPT.
SERVICE DEPT.
- TAMPA
- S.FLORIDA

Compressed Gas Transportation Guidelines

The following guidelines are restated by manufacturers of several different types of compressed gas cylinders:

1. Never transport a filled CO₂ cylinder in a passenger vehicle.
2. Cylinders should never be transported in an enclosed vehicle unless the driver is separated from the cargo by a gas tight barrier.
3. Cylinders should be transported in a continuously cool place. Do not transport cylinders adjacent to any source of heat, intermittent or continuous.

A properly charged cylinder could vent through its safety relief device at approximately 150 °F. A slightly overfilled cylinder could vent through its safety relief device when exposed to a much lower temperature.

The CGA recommends that cylinders be stored in areas with a temperature less than 125 °F.

4. Do not transport a leaking cylinder.

5. Damaged cylinders should only be transported without fill and marked "DAMAGED".

6. Empty cylinders should be transported with their valves tightly closed.

7. Cylinders, which have been manufactured to accommodate a carrying handle or a protective cap,



should be transported with these accessories in place.

8. Cylinders can be transported standing on their base or lying on their side.

It is recommended that the cylinders be transported as designed, standing on their flat base.

The CGA recommends that cylinders that are shipped never be stacked on top of each other.

9. All cylinders, after being loaded for transit, when in transit, and when waiting for unloading after transit should be secured by ade-

quate means to protect the cylinders.

10. If a cylinder is determined to be leaking or venting while in transit:

- Immediately pull the vehicle over to the side of the road. Do not try to continue driving, or remain in, the vehicle while the cylinder is leaking or venting.

Inhalation of as little as 3% CO₂ gas can cause uncomfortable physiological effects.

Inhalations of large amounts of CO₂ gas, 10% and above, can cause unconsciousness (in less than 1 minute) and possibly death.

- Do not try to stop a cylinder from leaking or venting. Leaking or venting gas can cause frostbite.
- Do not try removing a leaking or venting cylinder from a vehicle.

Today's

References:

- **US Code of Federal Regulations 49, Parts 172-173**
- **Www.catalinacylinders.com**
- **DuPont FE-25 Fire Extinguishing Agent: Properties, uses, Storage and Handling**

Placarding

Placarding is not required on vehicles transporting less than 1001lbs. gross weight of the actual Class 2.2 hazardous material.

Transport vehicles transporting over 1000lbs. of the Class 2.2 hazardous material, should have placards on all four sides of the vehicle.

Placards, a larger version of labels, are required to be displayed on bulk con-

tainers, unit load devices, transport vehicles or rail car containing

any quantity of a hazardous material. (See 172.519 for details regarding placard specifications)

- On each side and each end of the transport vehicle
- Securely affixed
- Located clear of all devices
- Located so that dirt or water is not directed to it from the wheels of the transport vehicle
- Be located away from any advertising (at least 3") that could reduce its effectiveness
- Made of any plastic,

metal or other material capable of withstanding without deterioration a 30-day exposure to open weather conditions.

- Min. 10.8in. on each side, text a min. 1.6in.
- Green placard with white lettering as



EMERGENCY RESPONSE PAPERWORK REQUIRED IN THE WAREHOUSE

- PHONE NUMBER OF STATE/ LOCAL AGENCY RESPONDING TO AN INCIDENT
- IMMEDIATE HAZARDS TO HEALTH
- RISKS OF FIRE
- IMMEDIATE METHODS FOR HANDLING FIRES

Protective Systems, Inc. places a high value on individual education. We are dedicated to providing ongoing training for our managers, designers, and technicians who are expected to maintain a minimum NICET II certification is fire alarm and/or fire special hazards.

As codes, applications and enforcements are continually changing, Protective Systems, Inc. feels it is important to highlight specific topics to provide clarification and encourage discussion.

Please forward all correspondence to kim.nielsen@callpsi.com

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S. Florida

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Doral, FL 33126

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