

NAVSEA  
STANDARD ITEM

FY-14

ITEM NO: 009-61  
DATE: 17 JAN 2013  
CATEGORY: I

1. SCOPE:

1.1 Title: Shipboard Use of Fluorocarbons; control

2. REFERENCES:

**2.1 Standard Items**

2.2 29 CFR Part 1915, Occupational Safety and Health Standards for Shipyard Employment

2.3 NFPA Standard 306, Standard for the Control of Gas Hazards on Vessels

2.4 40 CFR Part 82, Protection of Stratospheric Ozone, Subpart F

3. REQUIREMENTS:

3.1 Accomplish work associated with the use of fluorocarbons aboard ship in accordance with this item.

3.2 Maintain at the work site a copy of the credentials of the Competent/Qualified Person who will monitor atmosphere, inspect and certify spaces are safe to enter, and who will supervise all activities.

3.2.1 A Qualified Person is defined as a National Fire Protection Association Certified Marine Chemist, an Industrial Hygienist, or a Competent Person as defined in 2.2 **and trained in accordance with 009-07 of 2.1**. These Qualified Persons shall be capable of specifying the necessary protection and precautions to be taken during fluorocarbon operations, as designated in 2.2 and 2.3.

3.3 Maintain a copy of a **fluorocarbon control plan** at the work site. **The plan shall include the following information and shall be provided to the SUPERVISOR upon request:**

3.3.1 Identification of hose/piping routes and steps to be taken to protect hoses along those routes

3.3.2 Type and location of warning signs

3.3.3 Type and location of portable ventilation required

- 3.3.4 Means of communication to be utilized
- 3.3.5 Type of hoses and material compatibility to fluorocarbons
- 3.3.6 Type of emergency breathing devices that are immediately accessible
- 3.3.7 Type and location of portable oxygen and halide monitoring detectors/alarms
- 3.3.8 Emergency evacuation and rescue procedures
- 3.3.9 Open flame and hot work controls
- 3.3.10 Results of preliminary tests, ensuring system integrity and absence of leakage
- 3.3.11 Provisions for periodic inspections that include adjacent spaces to ensure work area containment and work practices are effective

3.4 Submit written notification to the SUPERVISOR and the Commanding Officer's designated representative at least 4 hours, but not more than 24 hours prior to commencement, each time fluorocarbons are utilized aboard ship for any purpose. Identify the time, location, and purpose of each evolution. Notify the SUPERVISOR and designated ship's representative immediately prior to the actual start and upon completion of each evolution.

3.4.1 Deliver notification of work planned Tuesday through Friday to the Commanding Officer's designated representative at least 30 minutes and not more than 24 hours preceding start of work.

3.4.2 Deliver notification of work planned over a weekend or Monday following that weekend to the Commanding Officer's designated representative no later than 0900 on the Friday immediately preceding that weekend.

(I) "INSPECT FLUOROCARBON EQUIPMENT"

3.5 A certified technician shall, as required by 2.3, pressure test the fluorocarbon charging and flushing handling equipment, i.e., hoses, piping, valves, fittings, and manifolds, using dry nitrogen with trace amounts of HCFC-22 compound at 150 percent of charging equipment working pressure within 30 days prior to use aboard ship. Hold test pressure for 15 minutes. Allowable leakage: None.

3.5.1 Attach a solid metal tag with the following to each piece of equipment passing test:

- 3.5.1.1 Name and address of testing facility
- 3.5.1.2 Description of equipment

3.5.1.3 Date of test

3.5.1.4 Test pressure

(I)(G) "INSPECT WORK SITE AND PROCESS PRIOR TO FLUOROCARBON OPERATIONS"

3.6 Inspect work site to ensure the following prior to fluorocarbon operations:

3.6.1 Provide ventilation to maintain oxygen content above 19.5 percent and not greater than 22.0 percent by volume in spaces where fluorocarbon compounds are in use.

3.6.2 Establish and maintain telephone communication between the pumping station and the space involved when the fluorocarbon compound is being transferred by hose or pipe.

3.6.3 Ensure that all personnel in a space where fluorocarbon operations are being carried out have an emergency escape breathing device (EEBD) in their possession or in the immediate area so that they can quickly don the units in case of a leak.

3.6.3.1 Each person shall have received instruction and practice in the use of the particular EEBD to be used, prior to entering each space where fluorocarbon operations are being carried out.

3.6.4 Suspend hot work in spaces prior to hook-up, test, and disconnect operations in which fluorocarbon compounds are exposed to the atmosphere.

3.6.4.1 Hot work is permitted in spaces traversed by lines carrying fluorocarbon compounds provided the lines are clearly tagged and no hot work is attempted within 3 feet of a tagged line.

3.6.5 Provide a halide monitor with alarm or equivalent instrument to continuously monitor the atmosphere in spaces where fluorocarbon compounds are used. If the concentration of fluorocarbon compound in the space exceeds the **Threshold Limit Value (TLV)** for the **fluorocarbon** compound (where the instrument is set to alarm), clear the space of personnel, notify Quarterdeck Watch immediately and the SUPERVISOR as soon as practical but not more than 30 minutes after the instrument alarms.

3.6.6 Post a caution sign in the area and at each entrance to the area.

3.6.6.1 The sign shall read: CAUTION: No open flames. Do not enter without testing the air for fluorocarbons.

3.6.6.2 The sign letters shall be at least one-inch high.

3.6.7 Provide a minimum of 2 people **trained and** familiar with the operation while a fluorocarbon compound is being used in quantities exceeding 10 pounds.

3.7 Accomplish preliminary pressure tests of charging/flushing equipment after connecting aboard ship each time equipment is used. Pressure shall equal 100 percent of charging/flushing equipment working pressure. Hold test pressure for 15 minutes. Allowable leakage: None.

3.7.1 Ensure charging equipment is isolated from equipment to be charged prior to test.

3.8 A certified technician shall, as required by 2.4, ensure that fluorocarbon gases are not vented to the interior of the ship or to the atmosphere when pressure is released from the system by utilizing reclaiming/recycling equipment tested and certified by an Environmental Protection Agency (EPA) approved laboratory or organization.

3.8.1 Collect CFCs and HFCs for either recycling back into the same system/piece of equipment from which the material was removed or recovering the CFCs for turn-in.

#### 4. NOTES:

4.1 Following are examples of commonly used fluorocarbon compounds:

Trichlorofluoromethane, Freon 11, R-11 (CFC-11)  
Dichlorodifluoromethane, Freon 12, R-12 (CFC-12)  
Chlorotrifluoromethane, R-13 (also component of R-503) (CFC-13)  
Pentachlorofluoroethane (CFC-111)  
Tetrachlorodifluoroethane (CFC-112)  
1,1,2 Trichloro-1,2,2 Trifluoroethane, Freon 113, Freon TF,  
Freon PCA, Genetron 113 (CFC-113)  
1,2 Dichlorotetrafluoroethane, R-114, Freon 114 (CFC-114)  
Chloropentafluoroethane, R-115 (also component of R-502) (CFC-115)  
Heptachlorofluoropropane (CFC-211)  
Hexachlorodifluoropropane (CFC-212)  
Pentachlorotrifluoropropane (CFC-213)  
Tetrachlorotetrafluoropropane (CFC-214)  
Trichloropentafluoropropane (CFC-215)  
Dichlorohexafluoropropane (CFC-216)  
Chloroheptafluoropropane (CFC-217)  
Tetrafluoroethane (HFC-134a)

4.2 EEBD equipment for Government representatives will be provided by the Government.

4.3 ODS material must be procured as Government Furnished Material (GFM) from the DOD ODS Reserve. Notify the SUPERVISOR at least 14 working days prior to anticipated usage.

4.4 The following definitions are delineated by Navy policy:

4.4.1 Recover - To remove refrigerant in any condition from a system and store it in an external container without necessarily testing or processing it in any way.

4.4.2 Recycle - To reduce contaminants in used refrigerant by oil separation and single or multiple passes through devices such as replaceable core filter dryers that reduce moisture, acidity and particulate matter. The term usually applies to procedures implemented at the field job site or at a local service shop.

4.4.3 Reclaim - To reprocess refrigerant to new product specifications by means that may include distillation. Chemical analysis of the refrigerant is required to determine that appropriate product specifications are met. This usually implies the use of processes or procedures that are available only at refrigerant reprocessing or manufacturing facilities.