

TRIFLUOROETHANE (HFC-4310mee / HCFC / HFC CLEANERS)

EXPOSURE IN NAVY AVIATION:

SHORT- AND LONG-TERM HEALTH EFFECTS

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Trifluoroethane and related fluorinated solvents (e.g., HFC■4310mee, HCFC■123, HFC■134a derivatives) have been widely used in U.S. Navy aviation for:

- Cleaning electronic components
- Degreasing sensitive avionics equipment
- Precision cleaning operations
- Removing hydraulic fluid and fuel residues
- Maintenance of cooling and environmental control systems

These solvents evaporate rapidly and create inhalation risks, especially in poorly ventilated hangars, avionics bays, and confined maintenance areas.

SHORT-TERM (ACUTE) EFFECTS OF TRIFLUOROETHANE EXPOSURE

1. ****Central Nervous System (CNS) Effects****

Fluorinated solvents can depress the CNS.

Common symptoms include:

- Dizziness
- Headaches
- Lightheadedness
- Loss of coordination
- Slowed reaction time
- Fatigue

High exposures may cause confusion or fainting.

2. ****Respiratory Irritation****

- Burning throat
- Coughing
- Shortness of breath
- Chest tightness

In confined spaces, oxygen displacement can occur.

3. ****Cardiac Sensitization****

Some fluorinated solvents can make the heart more sensitive to adrenaline, increasing risk of:

- Irregular heartbeat
- Palpitations
- Potential arrhythmia under stress

4. ****Skin & Eye Irritation****

Liquid refrigerant or solvent contact may cause:

- Frostbite-like cold burns
- Redness and irritation
- Dryness or skin cracking

5. ****Asphyxiation Risk****

High volume vapor releases can displace oxygen, causing:

- Rapid confusion
- Blue lips/fingernails
- Loss of consciousness

LONG-TERM (CHRONIC) EFFECTS OF TRIFLUOROETHANE EXPOSURE

1. ****Chronic Neurological Symptoms****

Long-term repeated exposure can lead to:

- Memory impairment
- Difficulty concentrating

- Chronic headaches
- Mood changes (anxiety or irritability)
- Sleep disturbances

2. ****Respiratory Effects****

Prolonged exposure may contribute to:

- Chronic cough
- Airway irritation
- Heightened asthma-like responses
- Reduced lung function

3. ****Heart Sensitization (Persistent)****

Some individuals experience:

- Long-term arrhythmia sensitivity
- Exertional palpitations

4. ****Liver and Kidney Stress****

Chronic exposure may produce:

- Mild liver enzyme elevation
- Kidney irritation

This is usually mild but documented in certain occupational groups.

5. ****Reproductive Concerns****

Some fluorinated solvents have been associated with:

- Reduced fertility (in animal studies)
- Developmental effects in very high exposures

6. ****Chemical Sensitivity****

With repeated exposure, some workers develop sensitivity to:

- Fumes
- Cleaning solvents

- Refrigerant vapors

NAVY AVIATION ROLES AT HIGHEST RISK

- Aviation Electronics Technicians (AT)
- Aviation Structural Mechanics (AM)
- Avionics cooling system maintainers
- Environmental control system technicians
- Component cleaning and degreasing personnel
- Depot-level artisans handling precision cleaning solvents

VA DISABILITY CLAIM WRITEUP EXAMPLE

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****Statement in Support of Claim: Trifluoroethane Exposure – Navy Aviation****

I am submitting this statement in support of my claim for service■connected disability related to long-term exposure to Trifluoroethane and related fluorinated cleaning solvents during my service in the United States Navy.

From [YEAR] to [YEAR], I served as an Aviation [RATE/MOS] assigned to the USS [SHIP] and naval air stations. My responsibilities included cleaning avionics components, degreasing sensitive aircraft parts, and maintaining environmental control and cooling systems. These tasks required frequent use of fluorinated solvents, including Trifluoroethane, often in enclosed aircraft bays, avionics compartments, and work centers with limited airflow.

Personal protective equipment was not consistently provided or enforced. As a result, I frequently inhaled solvent vapors and experienced immediate symptoms including dizziness, headaches, throat irritation, nausea, and occasional impaired coordination. I also experienced skin irritation when liquid refrigerant or cleaner contacted my hands or arms.

Since leaving the Navy, I have continued to experience chronic symptoms consistent with long-term solvent exposure, including persistent headaches, memory and concentration difficulties, chronic fatigue, respiratory irritation, and heart palpitations. Medical evaluations have documented [NEUROLOGICAL SYMPTOMS / RESPIRATORY CONDITION / CARDIAC IRRITABILITY / OTHER], all conditions associated with long-term exposure to fluorinated industrial solvents.

Given the nature of my duties, the frequency of exposure, the lack of consistent protective measures, and the persistence of symptoms following service, I believe my medical conditions are directly related to my Navy aviation occupational exposure. I respectfully request that the VA recognize these disabilities as service■connected.

Signed,

[Veteran Name]

[Date]