

Industrial Solvents

For Service members and their Families

Important Facts:

- Solvents are substances, usually liquid, that are commonly used to dissolve unwanted substance or material. Solvents are among the most frequently used industrial chemicals because of their ability to clean grime and grease.
- Too much exposure to some solvents can result in short and/or long-term health effects, however, there are safe ways to use each solvent at your home and when deployed that will protect your health..
- Each solvent has slightly different health effects associated with it, and some solvents are much safer than others. If you have questions or concerns about a solvent, ask your healthcare provider, or an occupational health, environmental health, or preventive medicine professional.
- Before using a solvent, or any chemical, always read the product label for warnings and directions for safe use, or consult with knowledgeable experts.

What are solvents?

Solvents are liquids that easily dissolve other substances such as paints, greases, wax, and oils. Solvents are found in fuels, adhesives, glues, cleaning fluids, epoxy resins, hardeners, lacquers, paints, paint thinners, primers, and even nail polish removers. Some examples of solvents that may cause illness due to frequent or too much exposure include acetone, alcohols, benzene, gasoline, mineral spirits, methylene chloride, toluene, turpentine, and xylene. More information about the health impacts specific to these solvents as well as other chemicals can be found at <http://www.atsdr.cdc.gov/>.

What are solvents used for?

Solvents are used for cleaning, degreasing, paint stripping, and thinning oil-based paints. They are commonly used to clean metal objects found in motor pools and aircraft maintenance facilities, as well as electronic parts and weapons. Some of the same solvents you use at your home station and in your home may also be used during deployments.

What are the hazards associated with solvents?

Many solvents pose a physical hazard because they have the ability to accidentally be set on fire or cause explosions. Most solvents should not be used near any type of fire (including cigarettes) or where sparks can be generated. Always read the product label for warnings and directions for safe use, or consult with knowledgeable experts. Rags soaked in solvents can spontaneously catch fire and must be stored in fire resistant, covered containers and disposed of daily to reduce this risk. Some solvents may also be a health hazard causing short- and/or long-term health effects. However, the ways the solvent impacts your health and how bad it effects you depends on the specific solvent; the level or concentration you are exposed to; how long you were exposed; and how it enters your body.

How can I or others be exposed to solvents and what are the associated health effects?

- **Breathing vapors.** Because many solvents evaporate quickly into the air, breathing in solvent vapors are a common route of exposure. Vapors can directly irritate the eyes and/or nose, and if inhaled, may cause drowsiness, fatigue, loss of coordination, irregular heart beats, and slowed and labored breathing. In extreme cases, exposures can be lethal and cause death. Excessive, repeated, and prolonged exposure to some types of solvent vapors has been known to result in permanent nerve or brain damage. Some solvents, such as benzene, can cause cancer under rare conditions.
- **Direct eye contact** with liquid solvents or to very high concentrations of solvent vapor may cause immediate burning and tearing. In such incidents, eyes should be flushed immediately with large amounts of water. Visit a medical care provider to evaluate the need for treatment.
- **Absorption into the body through the skin.** Many solvents can easily pass through the skin. Some also can pass through gloves or other protective clothing if they are not designed to protect against the specific solvent. Skin contact with solvents can result in loss of the protective fats and oils in the skin, resulting in dryness and irritation, rashes, or chemical burns. Simple skin irritation may take about a week to clear up, but in severe cases, it may take



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A collaborative effort between the Air Force Institute for Operational Health, the Deployment Health Clinical Center, Force Health Protection and Readiness, the Navy Environmental Health Center, the U.S. Army Center for Health Promotion and Preventive Medicine, and the OUSD(P&R)/Military Family and Community Policy

longer. Excessive skin exposure to some solvents can result in many of the same health effects seen after breathing in solvent vapors.

- **Ingestion.** Although not common, directly swallowing solvents or consuming food or drink contaminated with solvents can cause illness.

See a medical health care provider if you are experiencing any symptoms that may be related to solvent exposure. Most exposures will not result in long-term health effects. For detailed health and safety information about specific solvents, product labels or Material Safety Data Sheets (MSDS) should be reviewed. MSDS's are available for every chemical manufactured in the U.S. They can be obtained from the military supply system, the manufacturer (see number on label), or via the internet by searching the product or manufacturer.

How can I protect myself from exposure?

The first step to protect against exposure to solvents or other chemicals is to understand the specific hazards. Always read the product label before you use it to ensure you are using it correctly and in the safest way. If you cannot identify a chemical, or do not know proper protective methods, consult an MSDS or a health professional for assistance prior to using it. Because solvents can be toxic (some are more toxic than others), even small exposures to some solvents over long periods of time may cause harm. Very high exposures over very short periods may be fatal. Odor is not a reliable indicator for determining overexposure because not all solvents have an odor or the odor is not directly related to levels associated with harm. If you believe you may have been overexposed to solvents, contact your health care provider for an evaluation. Here are some ways to protect against exposure to solvents:

- **Ensure Adequate Ventilation.** If enough fresh air is present, sometimes fresh air can reduce vapors to levels that are not harmful. Some situations may require local

exhaust ventilation, such as paint spray booths and laboratory hoods. If you're not sure if ventilation is adequate, get a qualified health or safety professional to evaluate the area. When the right amount of ventilation can not be obtained, respirators must be worn. If respiratory protection is needed, a qualified health professional must ensure that the type of respirator selected provides the right amount of protection, that it fits properly, and that you are trained to use it correctly.

- **Protect Your Eyes and Face.** Use safety glasses, goggles, or a face-shield, as appropriate, to prevent contact with solvents as a result of splashing into eyes and face.
- **Protect Your Skin.** Skin exposures to solvents can be prevented by the use of the appropriate gloves or barrier creams. Because solvents react differently to various types of glove materials, it is important to only use gloves approved for the specific solvent. Check the label, the Material Safety Data Sheet (MSDS), or ask a qualified health professional to determine the correct gloves. Splash or fluid resistant clothing such as aprons may also need to be worn. Always use good hygiene and wash hands after working with solvents and before eating, drinking, or smoking to prevent ingestion. Hand cream is useful to treat dry skin resulting from solvent contact.

Is there a test to determine if I have been excessively exposed to solvents?

There are tests for certain solvents that can determine if it got into the body up to a few days following exposure; but these tests are rarely used because they provide little information about the exposure or treatment that may be needed. Your health care provider may recommend medical follow-up for repeated exposures or following a large or severe exposure. In some instances, if you work with solvents on a frequent basis, your health care provider may recommend placing you in a medical monitoring program to monitor your health.

Where Do I Get More Information?

DoD Deployment Health Clinical Center (DHCC)

Phone: (866) 559-1627

<http://www.pdhealth.mil/>

DoD Force Health Protection and Readiness Programs (FHP & R)

Phone: (800) 497-6261

<http://fhp.osd.mil>

National Institute for Safety and Health, CDC
Organic Solvents:

<http://www.cdc.gov/niosh/topics/organsolv/>

Navy Environmental Health Center (NEHC)

Phone: (757) 953-0700

<http://www.nehc.med.navy.mil>

Air Force Institute for Operational Health (AFIOH)

Phone: (888) 232-3764

<http://www.brooks.af.mil/afioh/>

Agency for Toxic Substances and Disease Registry,
Department of Health and Human Services

800-232-4636

E-mail: cdcinfo@cdc.gov

CDC Emergency Response: 770-488-7100

U.S. Army Center for Health Promotion and Preventive
Medicine (USACHPPM)

Phone: (800) 222-9698

<http://chppm-www.apgea.army.mil>



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