

DECIMET SALES WRITTEN RIGHT TO KNOW PROGRAM

Decimet Sales has developed a program to establish procedures for working with and handling hazardous substances. This program supports compliance with the Minnesota Occupational Safety and Health Administration (MNOSHA) Right To Know Standard. This program applies to all company employees who are routinely exposed to hazardous substances.

The Right To Know Program will include information on:

- Hazardous Substance Inventory
- Container labeling
- Material Safety Data Sheets (MSDS)
- Employee training.
- Non-routine tasks
- Noise
- Carbon Monoxide
- Welding
- Metals
- Oils & Lubricants
- Solvents
- Compressed Gas Cylinders
- Acids & Alkalis
- Resins & Sealants
- Paints & Varnishes
- Heat Stress
- Cold Stress
- Infectious Agents
- Summary

The following program outlines the steps that will help to accomplish these objectives.

● **HAZARDOUS SUBSTANCE INVENTORY**

A list of all known hazardous substances will be kept in each of the MSDS books. The Safety Director, Tony Hines is responsible for maintaining the list, and will keep it updated.

● **CONTAINER LABELING**

Any container with a label provided by the manufacturer will be considered acceptable for use and properly labeled when the label contains the following information:

- The container is clearly labeled as to the contents.

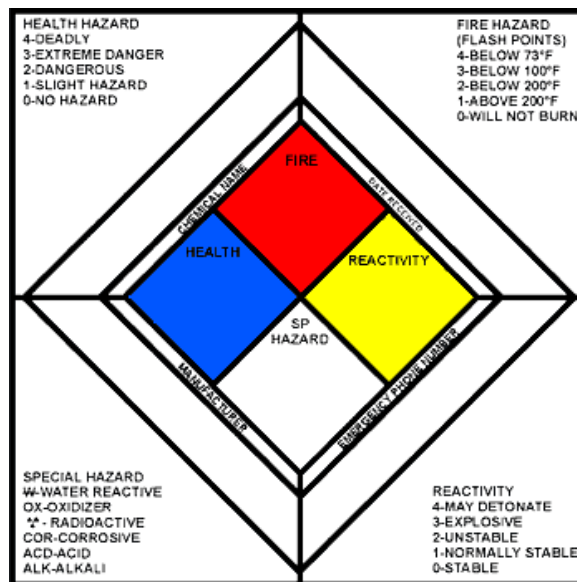
- Appropriate hazard warnings are noted (i.e. flammable, eye irritant, etc.)
- The name and address or phone number of the manufacturer is listed.

The responsibility has been assigned to the Safety Director to ensure proper labeling of all containers.

To help ensure that employees are aware of the hazardous substances used or stored in their work areas, it is also our company policy to label all “secondary containers” such as generic spray bottles, squirt/squeeze bottles, etc. that contain more than a “day’s use” quantity of a hazardous substance.

In addition, if any container in the shop is found to have a missing or damaged label, a replacement/generic label needs to be provided for the container.

Again, the Safety Director will ensure that all containers are labeled with the original manufacturer’s label or with a generic label which utilizes the NFPA numbering system (Red, Blue, Yellow, White Placard with 0-4 numbering system). Labels are available in the supply room.



- **MATERIAL SAFETY DATA SHEETS (MSDS)**

Copies of MSDS for hazardous substances to which employees may be exposed **are kept in the Machine Shop**. The Safety Director will be responsible for obtaining and maintaining the data sheet system for Decimet Sales.

The MSDS books will be organized alphabetically by product name.

The Safety Director will review all new data sheets for significant health/safety information. The Safety Director will also see that any new information is passed on to the affected employees.

If an MSDS is missing or obviously incomplete, a new MSDS will be requested from the manufacturer or supplier. If a MSDS is not available please contact your Safety Director immediately.

As a “rule of thumb” MSDS will be updated at least every 5 years. Decimet Sales will contact the supplier or manufacturer of the product MSDS, and request an updated MSDS if it is 5 years old or older. If an updated MSDS is not available, the MSDS will be dated at the top to indicate that the MSDS is the most current to date. Another check should be made after another 5 years if no updates have been obtained.

- **EMPLOYEE INFORMATION AND TRAINING**

New employees will be shown where the MSDS are kept, what hazardous substances they may be exposed to, and how to work safely with the substances. A MSDS will be reviewed to ensure that the new employee knows where to find the safety information they might need or want.

Employees will also be expected to attend an annual health and safety training meeting set up by the Safety Director which will include the following:

- An overview of the requirements contained in the Right To Know regulations including their rights under the MNOSHA regulations.
- Location and availability of the written Right To Know Program and MSDS.
- How to lessen or prevent exposure to these hazardous substances through usage of engineering controls, work practices, and personal protective equipment
- How to read labels and review MSDS to obtain appropriate hazard information.

Affected employees will be informed when new hazardous substances are introduced. Your **Safety Director** will review the above items as they relate to the new material in your work area.

- **NON-ROUTINE TASKS INVOLVING HAZARDOUS SUBSTANCES**

Periodically, employees are required to perform non-routine tasks which require the use of hazardous substances. Prior to starting work on such tasks, each affected employee will be given information by **Safety Director** about hazards to which they may be exposed during such an activity.

This information will include:

- Specific hazards.
- Protective/safety measures and personal protective equipment that must be utilized.

- **NOISE**

Decimet Sales is aware of having exceeded OSHA's 85 dba TWA action level (average daily dose allowed). Hearing protectors are available for your use during noisy operations.

See the Hearing Conservation Program for more information.

- **CARBON MONOXIDE**

Carbon Monoxide is a colorless, odorless, and tasteless gas that will cause headache, nausea, dizziness, etc. if an overexposure condition exists.

Carbon Monoxide is produced whenever forklifts are operated. To ensure that carbon monoxide levels do not exceed 35 ppm TWA set by MNOSHA, DSI will perform air sampling at least quarterly in areas where carbon monoxide exposure is most likely. Records of air sampling results will be maintained.

Contracted forklift service technicians will also perform tailpipe exhaust gas analysis during final engine tuning in a regular maintenance program to ensure that exhaust gases do not contain more than 1% carbon monoxide.

- **WELDING**

On occasion, some arc welding for repair of shop tools and equipment is performed. Welders know the hazards from Ultra Violet radiation, and they wear appropriate eye protection and clothing. Employees in adjacent work areas are instructed to not look at the arc weld. Shielding is provided for exposed/adjacent workers as needed/required.

Welding problems can vary with the method of welding employed, the location of the work, the materials being welded, and the control measures in use.

Certain hazards are common to most arc welding processes. Principally, they are as follows:

DAMAGE to the skin and eyes from:

- a) infrared and ultraviolet radiation
- b) molten metal
- c) electric arc.

BURNS from contact with hot metal or sparks.

ADVERSE health effects from breathing metal fumes and gases.

ULTRAVIOLET RADIATION (UV):

Eye exposure to the arc can result in a condition known as Welder's Flash or Arc Eye - an irritation with a sensation of sand in the eyes. Flash burns are painful and repeated exposure may result in permanent eye injury.

INFRARED RADIATION (IR):

IR radiation from molten metal produces a sensation of burning on the skin, but is usually not of sufficient intensity to cause permanent damage to the skin.

FUMES & GASES:

The hazard potential from the fumes and gases generated by a welding or soldering operation depends on:

- * The chemical composition of the materials being used
- * The concentration of the chemical in the worker's breathing zone
- * The duration of exposure

A. Gases

Ozone and nitrogen oxides are the main toxic gases produced by the arc welding process. Ozone is an irritating gas and is produced by the action of the electric arc passing through the air.

Phosgene and hydrogen chloride may be formed when welding in the presence of chlorinated solvents. The ultraviolet rays from welding decompose the solvents releasing these gases. They are both respiratory irritants and phosgene is highly toxic.

B. Fumes

Metal fumes are generated from the wire or rod and welding on metals coated or continuing alloys of lead, zinc, cadmium or beryllium. Some paints may also produce toxic fumes when heated with the welding torch.

Metal fume fever: Overexposure to metal fumes including zinc and copper may produce this disease. Metal fume fever is most commonly associated with welding on galvanized metal without local exhaust. The symptoms are similar to flu and usually occur a few hours after exposure. The symptoms usually abate in 12 to 24 hours with complete recovery following. Immunity from this condition is rapidly acquired if exposure occurs daily, but is quickly lost during holidays or over weekends. Because of this behavior, metal fume fever is sometimes known as Monday Morning Sickness.

Coated welding wire usually contains copper resulting in copper fume when heated.

Iron oxide fume is the most common metal fume exposure resulting from welding on low alloy steel. Changes in X-rays of the lungs have been observed in welders with chronic overexposure to iron oxide fume, but there has been little or no decrease in lung function observed. This condition is called siderosis.

Aluminum oxide is not toxic to the human body, but exposure levels should be controlled as with all welding fumes.

Soldering: The exposure depends on the base metal, wire composition, type of flux. There is a potential for exposure to lead, silver and cadmium fumes. These fumes may cause respiratory irritation as well as long term health effects such as lung disease and neurological disorders. Some fluxes are also skin irritants.

Special precautions should be taken when working with hydrazine fluxes.

AVOID SKIN CONTACT WITH FLUX SOLUTIONS.

CONTROLLING THE HAZARD

1. Local exhaust to lower the concentration of fumes in the worker's breathing zone is the primary control method. The general ventilation system also helps to dilute any concentration of fumes in the air.
2. Follow safety procedures required for welding (or soldering). Read and follow all warning labels.
3. Use all required protective equipment, including respirators as necessary. Wearing a welder's helmet reduces the concentration of welding fumes entering the breathing zone while also protecting the eyes.
4. Never weld inside confined spaces without adequate ventilation or the use of supplied-air respirators.
5. Never weld in an area where the vapors of chlorinated solvents are present.

● **METALS**

Metals may present a health hazard when they are machined or heated. This hazard is posed primarily by the particulate dust created in sawing, grinding, drilling, or other machining operations, or in sanding; and by the fumes given off by metals when they are welded or soldered.

HEALTH EFFECTS

The health effects of metals vary depending upon the metal (and the amount of exposure). Listed below are the symptoms of overexposure, effects of chronic overexposure, and emergency and first aid procedures.

ALUMINUM Fumes are a low health risk by inhalation. Chronic overexposure may cause changes in lung tissue. Emergency & First Aid Treatment: No medical treatment necessary.

ANTIMONY May cause irritation to skin (contact dermatitis). Inhalation can cause inflammation of the upper and lower respiratory tracts. Chronic poisoning symptoms are dryness of the throat, nausea, headaches, sleeplessness, loss of appetite and dizziness. In acute severe poisoning there may be death from circulatory or respiratory failure or toxic hepatitis. Emergency & First Aid Treatment: Remove from exposure and have biological monitoring under direction of a physician.

BERYLLIUM Enters the body almost entirely by inhalation and can cause systemic disease of long duration. Symptoms are weakness,

fatigue, and weight loss. Beryllium is a possible carcinogen.
Emergency & First Aid Treatment: Remove from exposure. On overexposure obtain prompt medical care by a physician.

CADMIUM	Inhalation may lead to chemical pneumonia and in severe cases pulmonary edema. Symptoms are influenza-like, similar to metal fume fever, and generally occur within an eight hour period. In severe cases death can occur after four to seven days. It should be stressed that Cadmium-induced kidney damage is irreversible. <u>Emergency & First Aid Treatment:</u> Remove from exposure and give oxygen therapy if necessary. Obtain prompt medical care.
CARBON	Low health risk by inhalation. <u>Emergency & First Aid Treatment:</u> No medical treatment necessary in its pure form.
COBALT	Inhalation of fumes will produce systemic poisoning with myocardial disorders and irritant effects on the airways, eyes, and digestive tract. Symptoms range from shortness of breath to coughing. Overexposure can also affect bone marrow and thyroid. <u>Emergency & First Aid Treatment:</u> No antidote exists. Monitoring by a physician with particular attention to the cardiovascular system is advisable.
CHROMIUM	Can cause skin and mucous membrane irritation, dermatitis, and chrome ulceration. Chronic overexposure may lead to bronchial carcinoma, adenocarcinoma. Chromium is suspected of being a mutagen. <u>Emergency & First Aid Treatment:</u> Wash skin thoroughly after contact. Obtain medical care for chrome ulceration.
COPPER	Fumes can cause nausea, gastric pain, diarrhea and irritation of the upper respiratory tract. Symptoms are often a metallic taste in the mouth. <u>Emergency & First Aid Treatment:</u> Remove from exposure.
IRON	Inhalation of oxide or dust can result in siderosis which causes a shortness of breath or coughing. <u>Emergency & First Aid Treatment:</u> Remove from exposure and obtain medical attention.
LEAD	Short term exposure symptoms may include stomach cramps, persistent vomiting, severe anemia, nervous disorders, acute encephalopathy followed by coma, cardio-respiratory arrest and death. Long term exposure symptoms are the above with a metallic taste in the mouth. Weakness of the extensor muscles of the wrist and ankle is noticeable in serious cases. <u>Emergency & First Aid Treatment:</u> Biological monitoring under the direction of a physician is required by OSHA regulations.
MAGNESIUM	Heavy exposure to fume may be irritation to the eyes, nose and throat, Magnesium can cause metal fume fever. <u>Emergency & First Aid Treatment:</u> Eye wash facilities should be used

immediately. No contact lenses should be worn in an area where magnesium fume or dust is present.

MANGANESE	Moderately toxic. May cause nose bleed, irritation to the throat and skin. Prolonged exposure can affect the nervous system, cause bronchitis, pneumonitis. <u>Emergency & First Aid Treatment:</u> Wash thoroughly upon irritation. If ingested, induce vomiting. Obtain medical attention.
MOLYBDENUM	Can cause morphological changes in the liver, kidneys and spleen; Anemia diarrhea, bone deformity and growth retardation. <u>Emergency & First Aid Treatment:</u> Obtain medical attention immediately.
NICKEL	Often causes allergic dermatitis. Inhalation can cause inflammation of the respiratory tract, pneumonocosis. In extreme cases it is suspected of causing cancer of the nasal cavities, lungs and other organs. <u>Emergency & First Aid Treatment:</u> Annual medical monitoring by a physician is recommended in areas where concentrations are greater than 15 UGNI/M3 TWA for a 40-hour work week.
PHOSPHORUS	Inhalation may cause osteomyelitis of the jaw bone. Skin contact by burning phosphorus slivers will cause severe burns. <u>Emergency & First Aid Treatment:</u> Douse burning slivers with a 1 to 5% solution of aqueous copper sulfate. Then remove slivers with large quantities of water. Medical attention must be obtained in cases of osteomyelitis.
SILICON	In a cold state, silicon is not dangerous.
SILVER	Localized argyria is caused by silver particles on the skin. Except for a bluish cosmetic disfigurement it is generally considered benign.
SULFUR	(As sulfur dioxide) Can cause edema to the lungs. <u>Emergency & First Aid Treatment:</u> Remove from exposure. Obtain medical attention.
TELLURIUM	Overexposure can cause garlic odor of the breath and perspiration; Metallic taste in the mouth and dryness. It may inhibit the sweat function and cause anorexia. <u>Emergency & First Aid Treatment:</u> Remove from exposure. Obtain medical attention.
TIN	Tin powder is moderately irritating to the eyes and airways. <u>Emergency & First Aid Treatment:</u> Remove from exposure.
TITANIUM	None.
VANADIUM	Can cause emphysema, pneumonia. <u>Emergency & First Aid Treatment:</u> Remove from exposure. Obtain medical attention.

ZINC

Exposure to zinc oxide fume can cause metal fume fever. Symptoms resemble influenza with chills and nausea. Overexposure may cause arthritis, lameness and inflammation of the gastrointestinal tract. Emergency & First Aid Treatment: Metal fume fever usually lasts less than 24 hours with no known treatment or lasting ill effects. For more serious effects, remove from exposure and obtain medical attention.

PRECAUTIONS / CONTROLS

1. When grinding, drilling, sawing, sanding, use a particle mask to avoid inhalation of particles and dusts.
2. Ensure adequate ventilation with local exhaust, filtered exhaust or respirators as required.
3. Never weld without protective equipment. A welder's mask diminishes the opportunity for inhalation of metallic fumes.
4. In cases where biological monitoring is required (as with lead) follow through conscientiously.

REMEMBER:

In most cases these metals will only be present as trace elements in the materials you work with. Your chances of overexposure are extremely small.

You should, however, be aware of what the danger signals are and know when your condition requires attention.

ALWAYS USE ALL AVAILABLE PROTECTIVE EQUIPMENT TO MINIMIZE OR ELIMINATE ANY RISK.

● **OILS & LUBRICANTS**

Also known as:

- Cutting oils
- Cutting compounds
- Lubricants
- Coolants
- Drawing pastes

MAJOR TYPES OF OILS & LUBRICANTS

1. Straight oils Insoluble in water
Derived from animal, vegetable or petroleum sources
2. Emulsified oils Water soluble
Derived from animal, vegetable or petroleum sources
3. Synthetic fluids Water soluble
Contain little or no oil

PURPOSE: Used as lubricants. Used in metal cutting and machining operations to dissipate heat and lubricate metal surfaces. Cutting fluids are also used to prolong rust-free tool life, permit higher cutting speed without friction and also to capture and flush away metal chips.

POTENTIAL HEALTH HAZARDS

1. Contact Dermatitis: This occurs as a result of cutting fluids removing the skin's natural oils. The skin becomes cracked and dry. A rash may develop upon prolonged contact.
2. Folliculitis: Heavier/thicker oils tend to block skin pores causing this type of Inflammation as well as acne.
3. Abrasions: From metal chips in cutting fluids.
4. Infection: From bacteria contained in contaminated cutting fluids entering through scraped or cut skin.

POTENTIAL HEALTH HAZARDS

5. Respiratory irritation: From prolonged or repeated inhalation of oil mist. Weakness and dizziness might also occur.
6. Some mineral oils may contain trace contaminants which have the potential for causing skin cancer after prolonged and repeated skin contact.

CONTROLS / PREVENTION

1. Avoid prolonged or repeated skin contact without proper skin protection. Depending on the extent of exposure you may need protective cream or gloves, and possibly, additional protective clothing.
2. Personal cleanliness: Remove cutting fluids from skin by washing with mild soap and water or using a waterless hand cleaner.
3. Replace the skin's moisture loss with a lanolin-rich hand cream.
4. Wash clothing in hot water and soap after each day's wear.
5. Keep your work area clean.
6. Cutting fluids should be monitored periodically for acidity, deterioration and cleanliness.

● SOLVENTS

Solvents are a class of liquids used to dissolve other solid materials. They may be found in many areas and in many solutions. They are substances to be treated with care and respect.

Solvents include the following:

Aliphatic hydrocarbons (butane, hexane)
Hexane, for example, is found in rubber cement.

Aromatic hydrocarbons (xylene, toluene)
These solvents are present in many paints.

Chlorinated hydrocarbons (trichloroethane, methylene chloride, perchlor)
These are often used in metal cleaning. They may also be found in paint thinners.

Fluorinated hydrocarbons (freons)

PROPERTIES OF SOLVENTS

Many solvents are flammable.
In general, solvents evaporate quickly.
Evaporation speeds with heat.
When exposed to flame, chlorinated hydrocarbons can decompose generating hydrogen chloride and phosgene.

HEALTH EFFECTS

1. Skin disorders: Repeated skin contact can cause a rash or irritation (dermatitis) as well as dry skin to the point of cracking and bleeding. Solvents should never be used to wash or clean skin. Some solvents can be absorbed both through intact and open skin. Particular attention should be paid to contact with these materials. This information will be noted on the Material Safety Data Sheet.
2. Eye injury: Solvent vapors can irritate the eyes. Direct splashing of the liquid into the eyes may cause serious burns.
3. Inhalation: Solvents act as central nervous system depressants. General symptoms include: headache, dizziness, nausea. Extreme overexposure situations could lead to unconsciousness. Solvent vapors can also act as respiratory irritants. Chronic overexposure to some solvents may cause permanent injury to the liver or kidneys, or other internal systems.

PRECAUTIONS / CAUTIONS

1. Wear solvent resistant gloves to prevent repeated or prolonged skin contact.
2. In operations where the liquid could splash into the eyes, chemical goggles or a face Shield should be worn. In case of eye contact, FLUSH THE EYES WITH WATER FOR AT LEAST 15 MINUTES while holding the eyelids open.
3. In operations where the liquid could splash onto skin, appropriate protective clothing, such as a solvent resistant apron, should be worn.

4. If skin contact should occur, FLUSH the area thoroughly for at least 15 minutes. Remove contaminated clothing.
5. Personal hygiene is very important. Wash thoroughly. Apply hand cream as needed to prevent drying of skin.
6. In situations where a respirator is required, be sure to wear the proper respirator. It should protect you against organic vapors.
7. In case of a spill or leak, AVOID contact with the material, WEAR a respirator to prevent overexposure during cleanup operations. ATTEMPT to stop the spread of the material. PROTECT the water supply. REMOVE all ignition sources.

- **COMPRESSED GAS CYLINDERS**

Typical hazards which could result from abuse or mishandling of compressed gas cylinders include leaks and explosions.

The following safe handling practices will assist in reducing or eliminating potential hazards:

1. Each cylinder must be clearly labeled with the contents and appropriate hazard warnings.
2. Container valves should be kept closed at all times whether charged or empty except when the container is in use.
3. Do not roll, drag or slide containers. Use a hand truck or other suitable device.
4. Do not lift containers by container caps.
5. All containers in service or in storage should be stored in it's designated area standing upright.

LEAK RESPONSE INFORMATION

CONTAINER LEAKS: **Remove leaking container outdoors or to well-ventilated area.
**Tag the leaking container with appropriate warning and notify the gas supplier.

VALVE LEAKS: Close container valve and tighten the valve gland or packing nut as appropriate. If the leak continues when the valve is opened, re-close the valve and tag the container as unusable.

- **STRONG ACIDS & ALKALIS**

Acids are chemically active materials. They are not flammable, but they can react with other chemicals, as in the case of a leak or spill, and cause a fire, explosion, or the generation of a toxic gas. They may be found in both solid and liquid forms.

Strong alkalis are found in caustic cleaning agents. They also come in both liquid and solid forms.

HEALTH EFFECTS

1. Both categories of chemicals are skin and eye irritants. Depending on the concentration, reactions can range from irritation to severe burns. Blindness can result from eye contact.
2. The vapors or mist from an acid are extremely irritating to the respiratory tract.
3. Inhalation of mist or dust of a strong alkali may cause irritation, dizziness, and/or injury to the respiratory tract.

PRECAUTIONS/CONTROLS

1. Rubber or plastic gloves are required when using a concentrated solution.
2. Apron or other appropriate garments should be used depending on the extent of exposure.
3. Wear goggles or face shield during pouring or mixing, or if there is a chance of splashing.
4. Use only in a well-ventilated area and avoid inhaling vapors or dusts.

REMEMBER: When acid and water must be mixed, acid must be poured slowly into the water.

- **RESINS & SEALANTS**

Resins are used as adhesives and as coatings. Some paints have an epoxy resin base. Some resins may also be used in fabricated products (plastics).

Unique properties of Epoxy Resins:

- Resistant to other chemicals and weathering
- Do not conduct electricity
- Harden at room temperature

Epoxy Resin Systems consist of:

- Resin
- Curing/Hardening Agent
- Solvents
- Catalyst

Potential Health Problems Associated With Epoxy Resins:

1. Dermatitis. Symptoms include dryness and reddening of skin with a skin rash at the point of contact. This type of reaction can occur from repeated or prolonged contact with the resin, curing agent or solvent. There have been no reports of dermatitis associated with contact with cured resins.
2. Sensitization. Dermatitis and/or itching sensation at the point of contact on the skin. This is an allergic reaction that usually develops over a period of time as a result of repeated and/or prolonged skin contact with the resin or curing agent.

Remember: once you are sensitized to this material, any contact will cause an allergic reaction.

3. Problems associated with solvent vapor inhalation. As described in the solvents section, possible symptoms are dizziness, headache, nausea, and loss of coordination. Respiratory irritation is not uncommon with prolonged exposure.

Potential Health Effects Associated with other Resin Systems:

1. Skin problems: Either most resins and sealants, including polyurethane and cyanoacrylate systems, irritation and dermatitis may occur.
2. Eye irritation. Many resin systems cause tearing and may cause blurred vision with concentrations of vapor in the air.
3. Polyurethane Systems. Part A is also a respiratory irritant. Respiratory sensitization may also occur after chronic exposure to low levels in sensitive individuals.
4. Cyanocrylates will rapidly bond skin together.

Precautions/Control Measures:

1. Personal hygiene. Always remove any material that has spilled on skin or clothing. Wash thoroughly before eating and at the end of the day. Do not wash up using solvents.
2. Avoid prolonged inhalation of fumes and vapors. Use a respirator if necessary.
3. Avoid smoking or eating in areas where epoxies are being used.
4. Mix epoxy resin systems in a well-ventilated area.
5. See the section on solvents for more information.

● **PAINTS & VARNISHES**

HAZARD POTENTIAL depends on the following:

- * Method of application
 - hand
 - mechanical dipping
 - spraying

- * Type of paint or varnish
 - oil base
 - water base
 - polyurethane
- * Type of pigment in the paint
 - lead chromate
 - titanium dioxide
- * Type of solvents
 - used in the paint or varnish
 - used in the work area
 - example: xylene, toluene, naphtha
- * Control measures present
 - local exhaust
 - personal protective equipment
 - spray booths

PAINTS - a liquid applied to protect, decorate or finish a solid surface.

VARNISH - an unpigmented resinous surface coating used for protection, decoration, or as a paint base.

HAZARDS

1. Dermatitis may occur from either excessive skin contact with solvents or occasionally from the paint itself.
2. Solvent vapor inhalation. General symptoms include dizziness, headache, nausea, and eye and nose irritation. See solvents section for more information.
3. Inhalation of paint pigment. Some paints contain toxic heavy metals such as lead and zinc chromates. Long term health effects from overexposure may include lung damage from chromate compounds, and possibly damage to blood-forming, nervous and reproductive systems from lead. More information on the effects of toxic heavy metals may be found in the metals section of this manual.

PRECAUTIONS / CONTROL MEASURES

1. Wear protective clothing as required or as needed to prevent prolonged skin contact.
2. Wear a respirator as needed, making sure that the appropriate cartridges are used.

3. DO NOT REMOVE PAINT FROM SKIN USING SOLVENTS!
4. Good personal hygiene is very important.
5. Use all available venting and filtering systems.

IT IS VERY IMPORTANT TO USE ALL OF THE FURNISHED PROTECTIVE EQUIPMENT.

As long as the proper precautions are exercised, little or no health risk exists.

- **HEAT STRESS**

Many workers spend some part of their working day in a hot environment. Workers in foundries, laundries, construction projects, and bakeries -- to name a few industries -- often face hot conditions which pose special hazards to safety and health.

HEAT STRESS CAUSES BODY REACTIONS

Four environmental factors affect the amount of stress a worker faces in a hot work area: temperature, humidity, radiant heat (such as from the sun or a furnace) and air velocity. Perhaps most important to the level of stress an individual faces are personal characteristics such as age, weight, fitness, medical condition and acclimatization to the heat.

The body reacts to high external temperature by circulating blood to the skin which increases skin temperature and allows the body to give off its excess heat through the skin. However, if the muscles are being used for physical labor, less blood is available to flow to the skin and release the heat.

Sweating is another means the body uses to maintain a stable internal body temperature in the face of heat. However, sweating is effective only if the humidity level is low enough to permit evaporation and if the fluids and salts lost are adequately replaced.

Of course there are many steps a person might choose to take to reduce the risk of heat stress, such as moving to a cooler place, reducing the work pace or load, or removing or loosening some clothing.

But the body cannot dispose of excess heat, it will store it. When this happens, the body's core temperature rises and the heart rate increases. As the body continues to store heat, the individual begins to lose concentration and has difficulty focusing on a task, may become irritable or sick and often loses the desire to drink. The next stage is most often fainting and death is possible if the person is not removed from the heat stress.

HEAT DISORDERS

Heat exhaustion results from loss of fluid through sweating when a worker has failed to drink enough fluids or take in enough salt or both. The worker with heat exhaustion still sweats but experiences extreme weakness or fatigue, giddiness, nausea, or headache. The skin is clammy and moist, the complexion pale or flushed, and the body temperature normal or slightly higher.

Treatment is usually simple: the victim should rest in a cool place and drink an electrolyte solution (a beverage used by athletes to quickly restore potassium, calcium, and magnesium salts). Severe cases involving victims who vomit or lose consciousness may require longer treatment under medical supervision.

Heat stroke, the most serious health problem for workers in hot environments, is caused by the failure of the body's internal mechanism to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat. Signs include (1) mental confusion, delirium, loss of consciousness, convulsions or coma; (2) a body temperature of 106 degrees F or higher; and (3) hot dry skin which may be red, mottled, or bluish. Victims of heat stroke will die unless treated promptly. While awaiting medical help, the victim must be removed to a cool area and his or her clothing soaked with cool water. He or she should be fanned vigorously to increase cooling. Prompt first aid can prevent permanent injury to the brain and other vital organs.

Heat cramps, painful spasms of the muscles, are caused when workers drink large quantities of water but fail to replace their bodies' salt loss. Tired muscles -- those used for performing the work -- are usually the ones most susceptible to cramps. Cramps may occur during or after working hours and may be relieved by taking liquids by mouth or saline solutions intravenously for quicker relief, if medically determined to be required.

Fainting (heat syncope) may be a problem for the worker unacclimatized to a hot environment who simply stands still in the heat. Victims usually recover quickly after a brief period of lying down. Moving around, rather than standing still, will usually reduce the possibility of fainting.

Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impedes a worker's performance or even results in temporary total disability. It can be prevented by resting in a cool place and allowing the skin to dry.

PREVENTING HEAT STRESS

Most heat-related health problems can be prevented or the risk of developing them reduced. Following a few basic precautions should lessen heat stress.

1. A variety of **engineering controls** including general ventilation and spot cooling by local exhaust ventilation at points of high heat production may be helpful. Shielding is required as protection from radiant heat sources. Evaporative cooling and mechanical refrigeration are other ways to reduce heat. Cooling fans can also reduce heat in hot conditions. Eliminating steam leaks will also help. Equipment modifications, the use of power tools to reduce manual labor and personal cooling devices or protective clothing are other ways to reduce the hazards of heat exposure for workers.

2. **Work practices** such as providing plenty of drinking water -- as much as a quart per worker per hour -- at the workplace can help reduce the risk of heat disorders. Training first aid workers to recognize and treat heat stress disorders and making the names of trained staff known to all workers is essential. Employers should also consider an individual worker's physical condition when determining his or her fitness for working in hot environments. Older workers, obese workers and personnel on some types of medication are at greater risk.

3. Alternating **work and rest** periods with longer rest periods in a cool area can help workers avoid heat stress. If possible, heavy work should be scheduled during the cooler parts of the day and appropriate protective clothing provided. Supervisors should be trained to detect early signs of heat stress and should permit workers to interrupt their work if they are extremely uncomfortable.

4. **Acclimatization** to the heat through short exposures followed by longer periods of work in the hot environment can reduce heat stress. New employees and workers returning from an absence of two weeks or more should have 5-day period of acclimatization. This period should begin with 50 percent of the normal workload and time exposure the first day and gradually building up to 100 percent on the fifth day.

5. **Employee education** is vital so that workers are aware of the need to replace fluids and salt lost through sweat and can recognize dehydration, exhaustion, fainting, heat cramps, salt deficiency, heat exhaustion, and heat stroke as heat disorders.

The Heat Equation

HIGH TEMPERATURE + HIGH HUMIDITY + PHYSICAL WORK = HEAT ILLNESS

When the body is unable to cool itself through sweating, **serious** heat illnesses may occur. The most severe heat-induced illnesses are heat exhaustion and heat stroke. If left untreated, **heat exhaustion** could progress to **heat stroke** and possible **death**.

Relative Humidity	Temperature
70%	100°F / 37.8°C
60%	95°F / 35°C
50%	90°F / 32.2°C
40%	85°F / 29.4°C
30%	80°F / 26.7°C

Legend:
Red: Danger
Pink: Caution
Yellow: Less Hazardous

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- **COLD STRESS**

As the weather becomes "frightful" during winter months, workers who must brave outdoor conditions face the occupational hazard of exposure to the cold. Prolonged exposure to freezing temperatures can result in health problems as serious as trench foot, frostbite, and hypothermia. Workers in such industries as construction, commercial fishing and agriculture need to be especially mindful of the weather, its effects on the body, proper prevention techniques, and treatment of cold-related disorders.

*** The Cold Environment**

An individual gains body heat from food and muscular activity and loses it through convection, conduction, radiation and sweating to maintain a constant body temperature. When body temperature drops even a few degrees below its normal temperature of 98.6°F (37°C), the blood vessels constrict, decreasing peripheral blood flow to reduce heat loss from the surface of the skin. Shivering generates heat by increasing the body's metabolic rate. The four environmental conditions that cause cold-related stress are low temperatures, high/cool winds, dampness and cold water. Wind chill, a combination of temperature and velocity, is a crucial factor to evaluate when working outside. For example, when the actual air temperature of the wind is 40°F (4°C) and its velocity is 35 mph, the exposed skin receives conditions equivalent to the still-air temperature being 11°F (-11°C)! A dangerous situation of rapid heat loss may arise for any individual exposed to high winds and cold temperatures.

Major Risk Factors for Cold-Related Stresses

- Wearing inadequate or wet clothing increases the effects of cold on the body.
- Taking certain drugs or medications such as alcohol, nicotine, caffeine, and medication that inhibits the body's response to the cold or impairs judgment.
- Having a cold or certain diseases, such as diabetes, heart, vascular, and thyroid problems, may make a person more susceptible to the winter elements.
- Being a male increases a person's risk to cold-related stresses. Sad, but true, men experience far greater death rates due to cold exposure than women, perhaps due to inherent risk-taking activities, body-fat composition or other physiological differences.
- Becoming exhausted or immobilized, especially due to injury or entrapment, may speed up the effects of cold weather.
- Aging -- the elderly are more vulnerable to the effects of harsh winter weather.

*** Harmful Effects of Cold**

Frostbite occurs when the skin tissue actually freezes, causing ice crystals to form between cells and draw water from them, which leads to cellular dehydration. Although this typically occurs at temperatures below 30°F (-1°C), wind chill effects can cause frostbite at above-freezing temperatures.

Symptoms:

Initial effects of frostbite include uncomfortable sensations of coldness; tingling, stinging or aching feeling of the exposed area followed by numbness. Ears, fingers, toes, cheeks, and noses are primarily affected. Frostbitten areas appear white and cold to the touch. The appearance of frostbite varies depending on whether rewarming has occurred.

Deeper frostbite involves freezing of deeper tissues (muscles, tendons, etc.) causing exposed areas to become numb, painless, hard to the touch.

Treatment:

If you suspect frostbite, seek medical assistance immediately. Any existing hypothermia should be treated first (See Hypothermia below). Frostbitten parts should be covered with dry, sterile gauze or soft, clean cloth bandages. Do not massage frostbitten tissue because this sometimes causes greater injury. Severe cases may require hospitalization and even amputation of affected tissue. Take measures to prevent further cold injury. If formal medical treatment will be delayed, consult with a health care professional for training on re-warming techniques.

General Hypothermia occurs when body temperature falls to a level where normal muscular and cerebral functions are impaired. While hypothermia is generally associated with freezing temperatures, it may occur in any climate where a person's body temperature falls below normal. For instance, hypothermia is common among the elderly who live in cold houses.

Symptoms:

The first symptoms of hypothermia, shivering, an inability to do complex motor functions, lethargy, and mild confusion, occur as the core body temperature decreases to around 95°F (35°C). As body temperature continues to fall, hypothermia becomes more severe. The individual falls into a state of dazed consciousness, failing to complete even simple motor functions. The victim's speech becomes slurred and his or her behavior may become irrational. The most severe state of hypothermia occurs when body temperature falls below 90°F (32°C). As a result, the body moves into a state of hibernation, slowing the heart rate, blood flow, and breathing. Unconsciousness and heart failure can occur in severe cases.

Treatment:

Treatment of hypothermia involves conserving the victim's remaining body heat and providing additional heat sources. Specific measures will vary depending upon the severity and setting (field or hospital). Handle hypothermic people very carefully because of the increased irritability of the cold heart. Seek medical assistance for persons suspected of being moderately or severely hypothermic.

If the person is unresponsive and not shivering, assume he or she is suffering from severe hypothermia. Reduction of heat loss can be accomplished by various means: obtaining shelter, removal of wet clothing, adding layers of dry clothing, blankets, or using a pre-warmed sleeping bag.

For mildly hypothermic cases or those more severe cases where medical treatment will be significantly delayed, external re-warming techniques may be applied. This includes body-to-body contact (e.g., placing the person in a pre-warmed sleeping bag with a person of normal body temperature), chemical heat packs, or insulated hot water bottles. Good areas to place these packs are the armpits, neck, chest, and groin. It is best to have the person lying down when applying external re-warming. You also may give mildly hypothermic people warm fluids orally, but avoid beverages containing alcohol or caffeine.

* Preventing Cold-Related Disorders

Personal Protective Clothing: perhaps the most important step in fighting the elements is providing adequate layers of insulation from them. Wear at least three layers of clothing:

- An outer layer to break the wind and allow some ventilation (like Gore-Tex® or nylon);
- A middle layer of wool or synthetic fabric (Qualofil or Pile) to absorb sweat and retain insulation in a damp environment. Down is a useful lightweight insulator; however, it is ineffective once it becomes wet.
- An inner layer of cotton or synthetic weave to allow ventilation.

Pay special attention to protecting feet, hands, face and head. Up to 40 percent of body heat can be lost when the head is exposed. Footgear should be insulated to protect against cold and dampness. Keep a change of clothing available in case work garments become wet.

Engineering Controls in the workplace through a variety of practices help reduce the risk of cold-related injuries.

- Use an on-site source of heat, such as air jets, radiant heaters, or contact warm plates.
- Shield work areas from drafty or windy conditions.
- Provide a heated shelter for employees who experience prolonged exposure to equivalent wind-chill temperatures of 20°F (-6°C) or less.
- Use thermal insulating material on equipment handles when temperatures drop below 30°F (-1°C).

Safe Work Practices, such as changes in work schedules and practices, are necessary to combat the effects of exceedingly cold weather.

- Allow a period of adjustment to the cold before embarking on a full work schedule.
- Always permit employees to set their own pace and take extra work breaks when needed.
- Reduce, as much as possible, the number of activities performed outdoors. When employees must brave the cold, select the warmest hours of the day and minimize activities that reduce circulation.
- Ensure that employees remain hydrated.
- Establish a buddy system for working outdoors.
- Educate employees to the symptoms of cold-related stresses -- heavy shivering, uncomfortable coldness, severe fatigue, drowsiness, or euphoria.

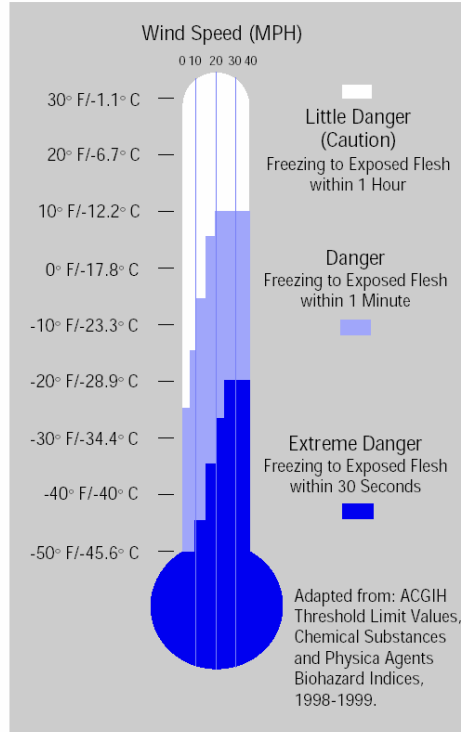
The quiet symptoms of potentially deadly cold-related ailments often go undetected until the victim's health is endangered. Knowing the facts on cold exposure and following a few simple guidelines can ensure that this season is a safe and healthy one.

THE COLD STRESS EQUATION

**LOW TEMPERATURE + WIND SPEED + WETNESS
= INJURIES & ILLNESS**

When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result.

Hypothermia can occur when *land temperatures* are **above** freezing or *water temperatures* are below 98.6°F/37°C. Cold-related illnesses can slowly overcome a person who has been chilled by low temperatures, brisk winds, or wet clothing.



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Occupational Safety and Health Administration

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- **INFECTIOUS AGENTS**

See the blood spill clean up plan and/or bloodborne pathogens control plan for more information.

- **SUMMARY**

Decimet Sales recognizes the need for a written Right To Know Program. If anyone has questions or suggestions about this plan contact the **Safety Director**. The plan will be reviewed on occasion by the Human Resources and/or any Safety committee member to help ensure that the policies are carried out and that the plan is effective.