

Health effects of chemicals

The chart on the following pages shows the known health effects of some specific chemicals used in the kinds of factories described in this book. Exposure to these chemicals increases your risk of getting the health problems shown in the chart.

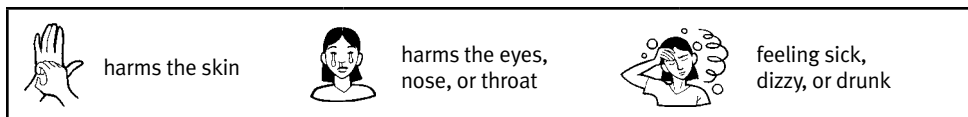
You can be exposed to a chemical by:

- breathing in chemical vapor in the air, or breathing in dust or smoke that contains chemicals.
- absorbing chemical dust, powder, grease, or liquid through your skin or eyes.
- putting food, drinks, or cigarettes in your mouth that have chemicals on them or in them, or by accidentally swallowing a liquid chemical.

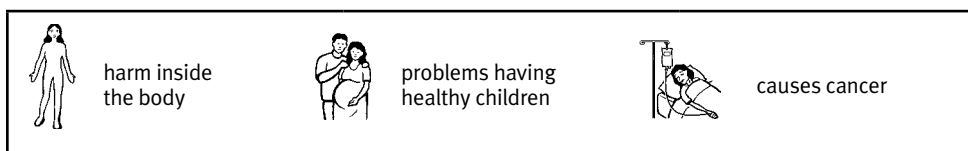
For more information about how chemicals get into the body, health problems caused by chemicals, and how to prevent exposure to dangerous chemicals, see 'Chemicals' on pages xx to xx.

What the symbols mean

These problems happen **more often**.



These problems happen less often, but they are **more serious**.



Some health effects are not known

Some chemicals may harm health in ways that are not shown in the chart. The **?** in the chart means there is not enough information about the long-term effects of a chemical to say how harmful it is. For more information about this problem, see 'Why are there poisonous chemicals in factories?' on page xx.

Chemical mixtures may be more dangerous

Scientists study each chemical alone to see how it can harm a person's health. But many chemical products —such as cleaners, dyes, paints, and glues— are a mixture of several chemicals. For example, paint contains solvents, pigments, and other materials. Solvents usually cause health problems that are different from the problems caused by pigments. There are very few studies to find out if chemical mixtures are more dangerous or have different harmful effects than each chemical by itself.



A chemical can have more than one name

We list each chemical in the chart by one name. You may know the same chemical by a different name. Sometimes the names of chemicals look very similar. The difference may be only a few letters or a number. Because of this, each chemical also has a unique number called a CAS number. The chart shows the CAS number of each chemical along with the other names of that chemical.

If the chemical name you want to look up is not in the chart, use the list of 'Other chemical names' on page xx to see if it has a different name in the chart. For example, the chemical "2-ethoxy ethanol" is sometimes called "Cellosolve®", and sometimes called "ethylene glycol monoethyl ether."

We have listed this chemical as "2-ethoxy ethanol" in chart. If you look for "Cellosolve®" in the list of 'Other chemical names,' you will find this entry:

Cellosolve® see 2-ethoxy ethanol
--

If you look for "ethylene glycol monoethyl ether" in the list of 'Other chemical names,' you will find this entry:










ethylene glycol monoethyl ether see 2-ethoxy ethanol
--









For more information about the health effects of chemicals, see xx in 'Resources,' on page xx.







How to find a specific chemical using the chart








To find information about a chemical, first look for the name of the chemical in the chart. If the name begins with a number, use the first letter of the name to find the chemical. For example, you will find “2-ethoxy ethanol” with the chemical names that begin with the letter ‘E’. The chemical names are listed in the order of the alphabet:







A B C D E F G H I J K L M N O P Q R S T U V W X Y Z







acetone		CAS# 67-64-1	
Other names: 2-propanone, dimethyl ketone			
Uses: solvent, nail polish remover			
	Red, itchy, dry, or cracked skin.		Watery, red eyes. Itchy, dry nose and throat.
			Headache , nausea, confusion, feel weak or dizzy.
	Harms brain.		Harms baby during pregnancy.
			None.
	Catches fire easily. Not as poisonous as most other solvents. Small amounts are safe to use. Smells very bad. See ‘Solvents’ on page xx.		







acrylamide		CAS# 79-06-1	
Other names: acrylamide monomer			
Uses: a white powder or liquid used in glues, dye, textiles, permanent press fabrics			
	Red, itchy, dry, or cracked skin. Skin on palms peels.		Watery, red eyes. Itchy, dry nose and throat.
			None.
	Serious harm to nerves in hands, arms, and legs.		?
			Cancer.
Acrylamide monomer is very poisonous and easily absorbed through skin.			







asbestos		CAS# 1332-21-4
Other names: none		
Uses: fireproof fabrics, brake lining, gaskets, heating and electrical insulation, pipe insulation, reinforcing in rubber, plastic, and cement		
 None.	 None.	 None.
 Hardening of the lungs (asbestosis).	 None.	 Lung cancer, cancer of the lining around the lungs (mesothelioma), and other cancers.
Very poisonous dust. See 'Asbestos' on page xx.		







benzene		CAS# 71-43-2
Other names: benzol, phenyl hydride		
Uses: solvent		
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache , nausea, confusion, feel weak or dizzy.
 Harms brain. Harms blood cells, causes weak blood (anemia).	 Harms baby during pregnancy.	 Cancer of the blood (leukemia) and other cancers.
 Catches fire easily. More poisonous than most other solvents. Easily absorbed through skin. See 'Solvents' on page xx.		







beryllium		CAS# 7440-41-7
Other names: Be, beryllium fluoride, beryllium chloride, beryllium sulfate, beryllium oxide, beryllium phosphate, glucinium		
Uses: in some metal alloys, especially for aerospace and high-tech parts		
 Red, itchy rash.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache , nausea, confusion, feel weak or dizzy.
 Breathing problems, fatigue, fever, weight loss. Harms brain, lungs, liver, kidneys, and bones.	 ?	 Lung cancer.
Very poisonous dust and fume. See also 'Lead and other toxic metals' on page xx.		







boric acid		CAS# 10043-35-3
Other names: none		
Uses: flame retardant treatment for cellulose, mattresses, and textiles glassmaking		
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 None.
 None.	 Makes men unable to have children.	 ?
Easily absorbed through skin.		



















bromopropane		CAS# 75-26-3 and 106-94-5
Other names: 1-bromopropane, 2-bromopropane, n-propyl bromide, isopropyl bromide		
Uses: solvent		
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 None.
 Anemia. Harms liver. Harms nerves controlling walking, bowel, bladder, and other functions.	 Makes men and women unable to have children. Affects women's monthly bleeding. Harms baby during pregnancy.	 Cancer.
More poisonous than most other solvents. Easily absorbed through skin. See 'Solvents' on page xx.		



















cadmium		CAS# 7440-43-9
Other names: none		
Uses: metal and compounds from metal alloys, enamels, fungicide, batteries, electronics, solder, pigment		
 None.	 Watery, red eyes.	 None.
 Harms kidneys, bones, lungs, nerves, and ability to smell.	 Harms ability of men to have children.	 Lung, prostate, and other cancers.
Very dangerous to inhale in any form. Causes fever with breathing problems (metal fume fever). See 'Lead and other toxic metals' on page xx.		







carbon monoxide		CAS# 630-08-0	
Other names: CO			
Uses: a gas found in motor exhaust, especially from gasoline, diesel, kerosene, and CNG motors, and in smoke and fumes from fires			
 None.	 None.	 Headache, nausea, feeling tired, unconsciousness, death.	
 Harms blood.	 Harms baby during pregnancy.	 None.	
CO has no smell. A common killer from running motors or burning fires indoors. See 'Motor exhaust' on page xx.			







carbon tetrachloride		CAS# 56-23-5	
Other names: carbon tet, carbon chloride, tetrachloromethane, Freon® 10, Halon® 104			
Uses: solvent, stain spotter			
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain, liver, kidneys, and heart.	 Harms baby during pregnancy.	 Liver cancer.	
More poisonous than most other solvents. Easily absorbed through skin. See 'Solvents' on page xx.			








chlorine		CAS# 7782-50-5	
Other names: chlorine gas			
Uses: disinfection treatment of water and sewage			
 Burns skin.	 Burns eyes, nose, and throat.	 None.	
 Causes death. Burns lungs. Asthma.	 None.	 None.	
Very dangerous to breathe in.			








chloroform		CAS# 67-66-3	
Other names: methane trichloride, trichloromethane			
Uses: solvent			
	Red, itchy, dry, or cracked skin.		Watery, red eyes. Itchy, dry nose and throat.
	Headache, nausea, confusion, feel weak or dizzy.		
	Harms brain, liver, kidneys, and heart. Can stop the heart.		Harms baby during pregnancy.
			Cancer.
More poisonous than most other solvents. Easily absorbed through skin. See 'Solvents' on page xx.			
chromium		CAS# 7440-47-3	
Other names: Cr, chrome, chromic acid, chromic trioxide, zinc chromate, potassium dichromate, and other chromate and dichromate compounds			
Uses: paints; stainless steel welding and cutting; chromate welding and cutting; electroplating baths for chrome plating onto metal and plastic; in stainless steel, pigments, dyes and glazes, wood preservatives, leather tanning, ferrochrome metal casting, anticorrosion coatings			
	Red, itchy allergic rash. Skin wounds that heal slowly.		Burns to eyes, nose, and throat from chromic acid. Wound inside nose.
	None.		
	Harms lungs causing wheezing, chest pain. Chromic acid can stain and eat away teeth.		?
			Lung cancer.
"Hard chrome" plating is more poisonous than "bright chrome" plating. See 'Lead and other toxic metals' on page xx.			
cobalt		CAS# 7440-48-4	
Other names: Co, carbides, cobalt sulfate			
Uses: metal and metal alloys such as steel and "hard metal" pigments, paint, coatings			
	Red, itchy allergic rash on neck, ankles, and elbow crease.		Watery, red eyes. Itchy, dry nose and throat.
	None.		
	Wheezing, cough, and feeling short of breath. Harms lungs and heart.		?
			Cancer.
See 'Lead and other toxic metals' on page xx.			







colophony		CAS# 8050-09-7	
Other names: colophony, rosin, resin			
Uses: cored solder and soldering flux, heat and pressure sensitive glue, paint, varnish, ink, corrosion inhibitors, grease, waterproofing agents			
	Allergic rash.		Watery, red eyes. Itchy, dry nose and throat.
			None.
	Asthma.		?
			?
People who have allergy to colophony may react to cosmetics and creams which contain colophony. See 'Welding and soldering fumes' on page xx.			
cyanide		CAS# 74-90-8	
Other names: CN, hydrogen cyanide, hydrocyanic acid, prussic acid, potassium cyanide			
Uses: metal treatment, fumigation potassium cyanide used in metal plating			
	Red, itchy, dry, or cracked skin. Burns.		Wound inside nose.
			None.
	Unconsciousness after weakness, headache, confusion, nausea.		?
			?
A fast-acting poison. Antidotes to poisoning exist. Easily absorbed through skin. See 'Electroplating baths' on page xx.			
DMF		CAS# 68-12-2	
Other names: n,n-dimethylformamide			
Uses: solvent, spinning acrylic fibers, adhesives, fabric dyes and pigments			
	Red, itchy, dry, or cracked skin.		Watery, red eyes. Itchy, dry nose and throat.
			None.
	Harms liver.		?
			Testicular cancer.
More poisonous than most other solvents. Easily absorbed through skin. See 'Solvents' on page xx.			







epoxy		CAS# none	
Other names: epoxy resin, glycidyl ether, epoxide, amine curing agents			
Uses: a 2-part liquid that turns solid commonly used as a surface coating, glue, binding agent, forms for metal casting, and rigid foam			
 Red, itchy, dry, or cracked skin. Allergic rash. Burns.	 Watery, red eyes. Itchy, dry nose and throat.	 None.	
 Asthma, difficulty breathing.	 ?	 ?	







2-ethoxyethanol		CAS# 110-80-5	
Other names: Cellosolve®, ethylene glycol monoethyl ether, EGEE, or any of these plus the word “acetate”			
Uses: solvent			
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain, blood (bone marrow), and kidneys.	 Very harmful to baby during pregnancy. Harms ability of both men and women to have children.	 ?	
More poisonous than most other solvents. Easily absorbed through skin. See ‘Solvents’ on page xx.			








ethyl acetate		CAS# 141-78-6	
Other names: none			
Uses: solvent			
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain.	 Harm to baby during pregnancy.	 ?	
 Catches fire easily. Less poisonous than many other solvents. See ‘Solvents’ on page xx.			







ethyl alcohol			CAS# 64-17-5
Other names: alcohol, grain alcohol, ethanol, denatured alcohol, SD alcohol			
Uses: solvent			
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain.	 ?	 None.	
 Catches fire easily. Less poisonous than most other solvents. Industrial ethyl alcohol is usually contaminated with other chemicals that make it more poisonous to drink than alcoholic beverages. See 'Solvents' on page xx.			










ethylene glycol			CAS# 107-21-1
Other names: ethylene alcohol, glycol, and 1,2-ethanediol			
Uses: solvent, antifreeze, polyester manufacture			
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain.	 Harms baby during pregnancy.	 ?	
See 'Solvents' on page xx.			









fiberglass and mineral wools			CAS# none
Other names: glass wool, fibrous glass, slag wool, rock wool, ceramic fibers			
Uses: insulation, filters, textiles, plastic reinforcement			
 Itchy, red rash.	 Watery, red eyes. Itchy nose and throat.	 None.	
 Harms lungs.	 None.	 Lung cancer.	
Less harmful than asbestos. Often used instead of asbestos.			









formaldehyde		CAS# 50-00-0	
<p>Other names: formalin (liquid), HCHO, formaldehyde gas Uses: permanent press fabric coating, foam insulation, epoxy resins, disinfectant, plywood and particle wood products</p>			
	Red, itchy, dry, or cracked skin. Burns. Allergic rash.		Watery, red eyes. Itchy, dry nose and throat.
			Headache and irritability from high exposure.
	Harms lungs. Asthma.		
			Cancer of nose, throat, and breathing passages.
<p>Extremely strong smell. Allergic skin rash and asthma may occur at exposure so low you cannot smell it. People who have allergy to formaldehyde may react to cosmetics which contain formaldehyde. See 'Formaldehyde' on page xx.</p>			








gasoline		CAS# 8006-61-9	
<p>Other names: petrol, motor fuel, benzene Uses: fuel, solvent</p>			
	Red, itchy, dry, or cracked skin. Burns.		Watery, red eyes. Itchy, dry nose and throat.
			Headache, nausea, confusion, feel weak or dizzy.
	Stops the heart. Harms brain and kidneys.		Leaded gasoline harms ability of both men and women to have healthy children, and harms baby during pregnancy.
			Cancer.
	<p>Catches fire easily. Easily absorbed through skin. Siphoning gasoline by mouth is very dangerous due to risk of swallowing gasoline. See 'Solvents' on page xx.</p>		








HCFCs and HFCs		CAS# different for each type	
<p>Other names: Freon substitutes, "ozone-safe" substitutes, hydrochlorofluorocarbons, hydrofluorocarbons Uses: liquids and gases used as refrigerant, solvent, propellant for aerosol spray, fire suppression systems, foam blowing agent</p>			
	Red, itchy, dry, or cracked skin.		Watery, red eyes. Itchy, dry nose and throat.
			Headache, nausea, confusion, feel weak or dizzy.
	Harm brain, liver, and heart.		Some types harm baby during pregnancy.
			?
<p>HCFC-123 harms liver. HCFC-124 and HCFC-125 may harm liver. Most HCFCs and HFCs are new chemicals and their health effects are unknown. Some are easily absorbed through skin.</p>			








hexane		CAS# 100-54-3	
Other names: n-hexane			
Uses: solvent, propellant for aerosol spray, glues			
	Red, itchy, dry, or cracked skin.		Watery, red eyes. Itchy, dry nose and throat. Cough.
			Headache, nausea, confusion, feel weak or dizzy.
	Numb or weak hands and feet. Harms nerves in hands, arms, legs, and feet.		Harms baby during pregnancy.
			?
	Catches fire easily. More poisonous than most other solvents. See 'Solvents' on page xx.		







hydrochloric acid		CAS# 7646-01-0	
Other names: HCl, muriatic acid, hydrogen chloride			
Uses: cleaning			
	Burns.		Burns to eyes, nose, and throat. Choking feeling.
			None.
	Burns lungs. Wears away teeth.		None.
			Lung cancer.







hydrofluoric acid		CAS# 7664-39-3	
Other names: HF			
Uses: etching baths, electroplating baths for metal, cleaning			
	Severe burns.		Severe burns to eyes, nose, and throat from liquid splash or vapor.
			None.
	Burns lungs. Chronic coughing. Harms bones.		?
			?
Extremely dangerous to touch liquid or inhale mist. Burns are often painless at first but are still very serious and will become painful later.			







hydrogen peroxide			CAS# 7722-84-1
Other names: 10% to 90% hydrogen peroxide			
Uses: bleach, deodorize, disinfect fabric or other materials			
 Red, itchy, dry, or cracked skin. Burns skin.	 Watery, red eyes. Burns eyes. Itchy, dry nose and throat.	 None.	
 None.	 ?	 ?	
 Helps other materials burn faster. Burns to eyes and skin from a splash may take hours or days to become visible.			







isopropyl alcohol			CAS# 67-63-0
Other names: isopropanol, propyl alcohol, IPA, 2-propanol, dimethylcarbinol			
Uses: solvent, soldering flux, disinfectant			
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain. Harms kidneys if swallowed.	 Harms baby during pregnancy.	 ?	
 Catches fire easily. Not as poisonous as most other solvents. See 'Solvents' on page xx.			







kerosene			CAS# 8008-20-6
Other names: stove oil, kerosine			
Uses: fuel, solvent			
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain.	 Harms baby during pregnancy.	 ?	
 Catches fire easily. "High Flash" kerosene does not catch fire as easily as other kerosene. See 'Solvents' on page xx.			








lead		CAS# 7439-92-1
Other names: Pb, any solid or liquid chemical with the word “lead” or “Pb” in the name		
Uses: in solder, batteries, radiators, gasoline, metal alloys, pigments in plastics, glazes and paint		
 None.	 None.	 None.
 Harms brain, nerves, kidneys, and blood (anemia).	 Harms ability of both men and women to have healthy children. Harms baby during pregnancy.	 Cancer.
Very poisonous dust. Lead in liquids is easily absorbed through skin. See ‘Lead’ on page xx.		







manganese		CAS# 7439-96-5
Other names: Mn, ferromanganese		
Uses: metal and steel alloys, welding rods, batteries		
 None.	 Itchy, dry nose and throat.	 Headache.
 Tremors, weakness, loss of balance, dementia. Harms brain, lungs, liver, and kidneys.	 Affects ability of men to have children.	 ?
Very poisonous fume and dust. See ‘Welding and soldering fumes’ on page xx and ‘Lead and other toxic metals’ on page xx.		








mercury		CAS# 7439-97-6
Other names: Hg, quicksilver, any chemical with mercury or Hg in the name		
Uses: metal and compounds, electrical parts, mirror coatings		
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 None.
 Tremors. Dementia. Harms kidneys, brain, and nerves.	 Harms baby during pregnancy. Passed to baby through mothers’ milk if mother works with mercury. Affects a woman’s monthly bleeding. Affects ability of men to have children.	 ?
Very poisonous. Liquid mercury at room temperature gives off vapors with no smell. See ‘Lead and other toxic metals’ on page xx.		








metalworking fluids			CAS# none
Other names: many types of metalworking fluids with different names			
Uses: cools and lubricates metals during machining			
	Red, itchy, dry, or cracked skin. Pimples. Allergic rash.		Watery red eyes. Itchy nose and throat. Coughing, sneezing.
			None.
	Harms lungs.		?
			Cancer of skin, lung, stomach, intestines.
May contain 2-ethoxyethanol, 2-methoxyethanol, or pentachlorophenol, which harm baby during pregnancy. See '2-ethoxyethanol' and '2-methoxyethanol' in this chart on page xx. See 'Metalworking fluids and machine lubricants' on page xx.			







2-methoxyethanol			CAS# 109-86-4
Other names: methyl Cellosolve®, ethylene glycol monomethyl ether, EGME, or any of these plus the word "acetate"			
Uses: solvent			
	Red, itchy, dry, or cracked skin.		Watery red eyes. Itchy nose and throat.
			Headache, nausea, confusion, feel weak or dizzy.
	Harms brain and blood cells (bone marrow).		Harms baby during pregnancy. Harms ability of both women and men to have children.
			?
More toxic than most other solvents. Easily absorbed through skin. See 'Solvents' on page xx.			








methyl alcohol			CAS# 67-56-1
Other names: methanol, wood alcohol, fuel alcohol			
Uses: solvent, lamp fuel			
	Red, itchy, dry, or cracked skin.		Watery red eyes. Itchy nose and throat.
			Headache, nausea, confusion, feel weak or dizzy.
	Harms brain. Drinking methanol causes blindness.		Harms baby during pregnancy.
			?
	Catches fire easily. See 'Solvents' on page xx.		







methylene chloride		CAS# 75-09-2
Other names: dichloromethane, methylene dichloride Uses: solvent, paint remover		
 Red, itchy, dry, or cracked skin.	 Watery red eyes. Itchy nose and throat.	 Headache, nausea, feeling tired, unconsciousness, death.
 Harms blood and heart. May stop heart.	 Harms baby during pregnancy.	 Cancer.
More poisonous than most other solvents. Easily absorbed through skin. See 'Solvents' on page xx.		







methyl ethyl ketone		CAS# 78-93-3
Other names: ethyl methyl ketone, 2-butanone, MEK Uses: solvent		
 Red, itchy, dry, or cracked skin.	 Watery red eyes. Itchy nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.
 Numbness in fingers, arms, legs. Harms brain.	 Harms baby during pregnancy.	 ?
 Catches fire easily. See 'Solvents' on page xx.		







methyl isobutyl ketone		CAS# 108-10-1
Other names: hexone, 4-methyl-2-pentanone, isopropylacetone, MIBK Uses: solvent		
 Red, itchy, dry, or cracked skin.	 Watery red eyes. Itchy nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.
 Harms brain and kidneys.	 Harms baby during pregnancy.	 ?
 Catches fire easily. See 'Solvents' on page xx.		







motor exhaust		CAS# none	
Other names: exhaust, engine fumes, motor vehicle exhaust, tailpipe emissions			
Uses: fumes from burning fuel, including diesel, gasoline, kerosene, propane, and CNG			
 None.	 Watery red eyes. Itchy nose and throat.	 Headache, nausea, feeling tired, unconsciousness, death.	
 Harms blood. Diesel exhaust causes asthma, bronchitis.	 Harms baby during pregnancy.	 Gasoline motor exhaust causes cancer. Diesel exhaust causes lung cancer.	
All motor exhaust contains carbon monoxide. See 'carbon monoxide' in this chart on page xx. Exhaust from motors using leaded gasoline also contains lead. See 'lead' in this chart on page xx and 'Motor exhaust' on page xx.			







naphtha		CAS# 8030-30-6	
Other names: petroleum naphtha, petroleum ether, petroleum distillates, mineral spirits, kerosene, paint thinner, VM&P naphtha, white spirits, benzin, ligroin			
Uses: solvent			
 Red, itchy, dry, or cracked skin.	 Watery red eyes. Itchy nose and throat. Coughing.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain.	 Harms baby during pregnancy.	 ?	
 Some catch fire easily. "High Flash" catch fire less easily. Most naphthas are less poisonous than most other solvents. "Coal tar" naphtha is more poisonous than other naphthas. See 'Solvents' on page xx.			







nickel		CAS# 7440-02-0	
Other names: Ni			
Uses: in metal alloys (stainless steel, copper, brass), electroplating baths for coating metal, batteries			
 Red, itchy, dry, or cracked skin. Allergic rash.	 Stuffy, runny nose. Harms sense of smell. Wound inside nose.	 None.	
 Harms lungs. Asthma.	 ?	 Cancer of lungs and nasal passages.	
Skin allergy to nickel is common. People who have an allergy to nickel may react to metal tools, coins, jewelry, pigments, or other things which contain nickel. See 'Lead and other toxic metals' on page xx.			







nitric acid		CAS# 7697-37-2	
Other names: engravers acid, azotic acid			
Uses: engraving, etching steel, urethane coatings, plastic, rubber			
	Mist causes red, itchy, dry, or cracked skin. Burns skin.		Mist causes red, watery eyes. Itchy nose and throat. Liquid burns eyes.
			None.
	Harms lungs. Burns to lungs may not be felt until hours after exposure. Wears away teeth.		None.
			?







NMP		CAS# 872-50-4	
Other names: n-methyl-2-pyrrolidone, m-pyrol			
Uses: solvent, waterproof coating for fabric, paint remover			
	Red, itchy, dry, or cracked skin.		Watery, red, painful eyes.
			Headache.
	?		Harms baby during pregnancy.
			?
Easily absorbed through skin. See 'Solvents' on page xx.			







phosphoric acid		CAS# 7664-38-2	
Other names: orthophosphoric acid			
Uses: treating metal, electroplating baths for metals, dying cotton, food processing			
	Burns skin.		Watery, red eyes. Burns eyes. Itchy, dry nose and throat. Coughing.
			None.
	None.		None.
			?
Not as poisonous as most other acids.			







<p>phthalates CAS # different for each type</p> <p>Other names: DEHP (di-ethylhexyl phthalate), DOP di-octyl phthalate), DBP (di (n-butyl) phthalate), DEP (diethyl phthalate), DBP (dibutyl phthalate)</p> <p>Uses: softener for making PVC and other plastics</p>		
 None.	 None.	 None.
 None.	 ?	 ?
<p>Easily absorbed through skin.</p>		








<p>polyurethane CAS # 9009-54-5</p> <p>Other names: polyurethane plastic, urethane, isocyanate, PUR plastic, HDI (hexamethylene diisocyanate), HMDI (methylene bis-cyclohexylisocyanate), IPDI (isophorone diisocyanate), MDI (methylene bis-phenylisocyanate), NDI (naphthalene diisocyanate), TDI (toluene diisocyanate)</p> <p>Uses: hard and soft plastic parts, textiles, rubber, foam, paint, coatings, sealants</p>		
 Red, itchy, dry or cracked skin. Allergic rash.	 Watery, red eyes. Itchy, dry nose and throat. Burns eyes.	 None.
 Wheezing, shortness of breath, asthma. Harms lungs.	 ?	 TDI causes cancer. Harm from other types unknown.
<p>Uncured liquid or sprayed polyurethane causes harm. Cured plastic is safe. Fume from melted or burned polyurethane is poisonous. See 'Plastic fumes' on page xx.</p>		







<p>PVC CAS # 9002-86-2</p> <p>Other names: polyvinyl chloride, vinyl chloride plastic</p> <p>Uses: hard and soft plastic parts and containers, textiles, rubber, foam, glue, sealants, coatings</p>		
 None.	 None.	 None.
 None.	 None.	 None.
<p>Soft PVC may contain phthalates. See 'phthalates' in this chart on page xx. Fumes from burned PVC are poisonous. See 'Plastic fumes' on page xx.</p>		







silica		CAS # none	
Other names: sand			
Uses: metalcasting, glassmaking, sandblasting, abrasive papers, grinding wheels			
 None.	 Red, watery eyes. Itchy, dry nose and throat.	 None.	
 Hardening of the lungs (silicosis).	 None.	 Lung cancer.	
Breathing silica dust increases risk of becoming ill with TB and makes TB worse in workers already ill. See 'Silica' on page xx and 'TB' on page xx.			








sodium hydroxide		CAS # none	
Other names: lye, caustic soda, sodium hydrate, white caustic			
Uses: textile and garment processing, etching, electroplating			
 Burns skin.	 Burns eyes.	 None.	
 None.	 None.	 ?	







sodium hypochlorite		CAS # 7681-52-9	
Other names: bleach, chlorine bleach, Clorox™			
Uses: bleaching textiles and garments, water purification, disinfectant			
 Red, itchy, dry, or cracked skin. Burns skin.	 Watery, red eyes. Burns eyes. Itchy, dry nose and throat.	 None.	
 None.	 None.	 ?	
Never mix with other chemicals. Mixing bleach with ammonia or an acid creates poisonous chlorine gas.			







styrene		CAS # 100-42-5
<p>Other names: styrene monomer, polystyrene, vinyl benzene, phenylethylene, Styrofoam™, Styron™</p> <p>Uses: a solid, strong plastic in many forms, such as rigid foam and hard plastic parts, casings, fiberglass lay-up, containers, packaging, insulation</p>		
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 None.
 Loss of hearing and ability to see colors. Harms liver, kidneys, heart, and nerves.	 Harms baby during pregnancy.	 Leukemia. Cancer of lymph nodes and blood (bone marrow).
 Catches fire easily. Liquid styrene is easily absorbed through skin. Fumes from burning polystyrene are poisonous. See 'Plastic fumes' on page xx.		







sulfuric acid		CAS # 7664-93-9
<p>Other names: hydrogen sulfate, battery acid</p> <p>Uses: in dye, pigment, etching, electroplating baths</p>		
 Burns skin.	 Burn eyes, nose, and throat.	 None.
 Burns lungs, causing death.	 None.	 Mist causes cancer of lungs, sinus, throat.







tetrachloroethylene		CAS # 127-18-4
<p>Other names: perchloroethylene, perc</p> <p>Uses: solvent, dry cleaning of fabric</p>		
 Red, itchy, dry or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.
 Numbness and weakness in hands and feet. Harms brain and liver.	 Harms baby during pregnancy.	 Throat cancer. Lymphoma.
<p>More poisonous than most other solvents. See 'Solvents' on page xx.</p>		








toluene		CAS # 108-88-3	
Other names: methylbenzene, phenylmethane			
Uses: solvent			
	Red, itchy, dry, or cracked skin.		Watery, red eyes. Itchy, dry nose and throat.
			Headache, nausea, confusion, feel weak or dizzy.
	Harms kidneys and liver. Harms nerves in arm and legs. Harms hearing.		Harms baby during pregnancy.
			?
 Catches fire easily. Easily absorbed through skin. See 'Solvents' on page xx. Workers can become addicted to sniffing toluene. Sniffing may cause sudden death.			







trichloroethane		CAS # 71-55-6 (1,1,1-TCA) and 79-00-5 (1,1,2-TCA)	
Other names: 1,1,1-trichloroethane, methyl chloroform, 1,1,2-trichloroethane, vinyl trichloride, beta-trichloroethane, TCA			
Uses: solvent, dry cleaning of fabric			
	Red, itchy, dry, or cracked skin.		Watery, red eyes. Itchy, dry, nose and throat.
			Headache, nausea, confusion, feel weak or dizzy.
	Harms brain. Stops heart.		Harms baby during pregnancy.
			?
See 'Solvents' on page xx.			

trichloroethylene		CAS # 79-01-6	
Other names: TCE			
Uses: solvent, dry cleaning of fabric			
	Red, itchy, dry, or cracked skin.		Watery, red eyes. Itchy, dry nose and throat.
			Headache, nausea, confusion, feel weak or dizzy.
	Harms brain, liver, and kidneys. Harms facial nerves, taste, and smell. Stops heart.		Harms baby during pregnancy. Harms ability of men to have children.
			Liver cancer. Lymphoma.
Drinking alcoholic beverages after working with TCE can immediately give you a headache or make you feel nauseous, dizzy, weak, or confused. See 'Solvents' on page xx.			

tricresyl phosphate		CAS # 1330-78-5	
Other names: TCP, TOCP, tri-o-cresyl phosphate			
Uses: in clear coatings and lubricating oils, softener for PVC			
 None.	 None.	 None.	
 Harms nerves, especially in legs. Stomach ache.	 ?	 ?	
More poisonous than most other solvents. Easily absorbed through skin.			

turpentine		CAS # 8006-64-2	
Other names: gum turpentine, wood turpentine, spirit of turpentine			
Uses: solvent, paint thinner			
 Red, itchy, dry, or cracked skin. Allergic rash.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain and kidneys.	 ?	 ?	
Easily absorbed through skin. See 'Solvents' on page xx.			

xylene		CAS # 1330-20-7	
Other names: dimethylbenzene, xylol			
Uses: solvent			
 Red, itchy, dry, or cracked skin.	 Watery, red eyes. Itchy, dry nose and throat.	 Headache, nausea, confusion, feel weak or dizzy.	
 Harms brain, liver, and kidneys.	 Harms baby during pregnancy.	 ?	
 Catches fire easily. Easily absorbed through skin. See 'Solvents' on page xx.			

zinc		CAS # 7440-66-6			
<p>Other names: galvanized coating, zinc oxide, zinc chloride</p> <p>Uses: in brass, bronze, and die-casting alloys electroplating and metal treating baths, batteries, pigment in paints and dyes</p>					
	Zinc chloride burns skin and causes allergic rash.		Zinc chloride burns eyes and lungs.		
				None.	
	Harms the lungs. Asthma.		?		?
<p>Welding metal containing zinc (galvanized steel) can cause metal fume fever. See 'Lead and other toxic metals' on page xx.</p>					

Other chemical names

Some of the names on this list are chemical compounds. For example, beryllium chloride and beryllium sulfate are compounds containing beryllium mixed with another chemical. Each chemical compound has its own CAS number that is different from the CAS number of the chemical listed in the chart on pages xx to xx. But the health effects of these compounds are the same as the health effects of the chemical listed in the chart. For ways to get more information about chemicals and their CAS numbers, see ‘Resources’ on pages xx to xx.

acrylamide monomer . . . *see* acrylamide
 alcohol . . . *see* ethyl alcohol
 amine curing agents . . . *see* epoxy
 azotic acid . . . *see* nitric acid

battery acid . . . *see* sulfuric acid
 Be . . . *see* beryllium
 benzene . . . *see* gasoline
 benzin . . . *see* naphtha
 benzol . . . *see* benzene
 beryllium chloride . . . *see* beryllium
 beryllium fluoride . . . *see* beryllium
 beryllium oxide . . . *see* beryllium
 beryllium phosphate . . . *see* beryllium
 beryllium sulfate . . . *see* beryllium
 beta-trichloroethane . . . *see* trichloroethane
 bleach . . . *see* sodium hypochlorite
 1-bromopropane . . . *see* bromopropane
 2-bromopropane . . . *see* bromopropane
 2-butanone . . . *see* methyl ethyl ketone

carbides . . . *see* cobalt
 carbon chloride . . . *see* carbon tetrachloride
 carbon tet . . . *see* carbon tetrachloride
 caustic soda . . . *see* sodium hydroxide
 Cellosolve® . . . *see* 2-ethoxyethanol
 Cellosolve® acetate . . . *see* 2-ethoxyethanol
 ceramic fibers . . .
 see fiberglass and mineral wools
 chlorine bleach . . . *see* sodium hypochlorite
 chlorine gas . . . *see* chlorine
 chrome . . . *see* chromium
 chromic acid . . . *see* chromium
 chromic trioxide . . . *see* chromium
 Clorox™ . . . *see* sodium hypochlorite
 CN . . . *see* cyanide
 CO . . . *see* carbon monoxide

Co . . . *see* cobalt
 cobalt sulfate . . . *see* cobalt
 colophany . . . *see* colophony
 Cr . . . *see* chromium

DBP (dibutyl phthalate) . . . *see* phthalates
 DBP (di-n-butyl phthalate) . . . *see* phthalates
 DEHP (di-ethylhexyl phthalate) . . . *see* phthalates
 denatured alcohol . . . *see* ethyl alcohol
 DEP (diethyl phthalate) . . . *see* phthalates
 dichloromethane . . . *see* methylene chloride
 dimethylbenzene . . . *see* xylene
 dimethylcarbinol . . . *see* isopropyl alcohol
 dimethyl ketone . . . *see* acetone
 DOP (di-octyl phthalate) . . . *see* phthalates

EGEE . . . *see* 2-ethoxyethanol
 EGEE acetate . . . *see* 2-ethoxyethanol
 EGME . . . *see* 2-methoxyethanol
 EGME acetate . . . *see* 2-methoxyethanol
 engine fumes . . . *see* motor exhaust
 engravers acid . . . *see* nitric acid
 epoxide . . . *see* epoxy
 epoxy resin . . . *see* epoxy
 1,2-ethanediol . . . *see* ethylene glycol
 ethanol . . . *see* ethyl alcohol
 ethylene alcohol . . . *see* ethylene glycol
 ethylene glycol monoethyl ether . . .
 see 2-ethoxyethanol
 ethylene glycol monoethyl ether acetate . . .
 see 2-ethoxyethanol
 ethylene glycol monomethyl ether . . .
 see 2-methoxyethanol
 ethylene glycol monomethyl ether acetate . . .
 see 2-methoxyethanol
 ethyl methyl ketone . . . *see* methyl ethyl ketone
 exhaust . . . *see* motor exhaust

- ferromanganese . . . *see* manganese
 fibrous glass . . . *see* fiberglass and mineral wools
 formaldehyde gas . . . *see* formaldehyde
 formalin . . . *see* formaldehyde
 Freon[®]10 . . . *see* carbon tetrachloride
 Freon substitutes . . . *see* HCFCs and HFCs
 fuel alcohol . . . *see* methyl alcohol
- galvanized coating . . . *see* zinc
 glass wool . . . *see* fiberglass and mineral wools
 glucinium . . . *see* beryllium
 glycidyl ether . . . *see* epoxy
 glycol . . . *see* ethylene glycol
 grain alcohol . . . *see* ethyl alcohol
 gum turpentine . . . *see* turpentine
- Halon[®]104 . . . *see* carbon tetrachloride
 HCHO . . . *see* formaldehyde
 HCl . . . *see* hydrochloric acid
 HDI (hexamethylene diisocyanate) . . . *see* polyurethane
 hexone . . . *see* methyl isobutyl ketone
 HF . . . *see* hydrofluoric acid
 Hg . . . *see* mercury
 HMDI (methylene bis-cyclohexylisocyanate) . . . *see* polyurethane
 hydrochlorofluorocarbons . . . *see* HCFCs and HFCs
 hydrocyanic acid . . . *see* cyanide
 hydrofluorocarbons . . . *see* HCFCs and HFCs
 hydrogen chloride . . . *see* hydrochloric acid
 hydrogen cyanide . . . *see* cyanide
 hydrogen sulfate . . . *see* sulfuric acid
- IPA . . . *see* isopropyl alcohol
 IPDI (isophorone diisocyanate) . . . *see* polyurethane
 isocyanate . . . *see* polyurethane
 isopropanol . . . *see* isopropyl alcohol
 isopropylacetone . . . *see* methyl isobutyl ketone
 isopropyl bromide . . . *see* bromopropane
- kerosene . . . *see* naphtha
 kerosine . . . *see* kerosene
- ligroin . . . *see* naphtha
 lye . . . *see* sodium hydroxide
- MDI (methylene bis-phenylisocyanate) . . . *see* polyurethane
 MEK . . . *see* methyl ethyl ketone
- methane trichloride . . . *see* chloroform
 methanol . . . *see* methyl alcohol
 methylbenzene . . . *see* toluene
 methyl Cellosolve[®] . . . *see* 2-methoxyethanol
 methyl Cellosolve[®] acetate . . . *see* 2-methoxyethanol
 methyl chloroform . . . *see* trichloroethane
 methylene dichloride . . . *see* methylene chloride
 4-methyl-2-pentanone . . . *see* methyl isobutyl ketone
 MIBK . . . *see* methyl isobutyl ketone
 mineral spirits . . . *see* naphtha
 Mn . . . *see* manganese
 motor fuel . . . *see* gasoline
 motor vehicle exhaust . . . *see* motor exhaust
 m-pyrol . . . *see* NMP
 muriatic acid . . . *see* hydrochloric acid
- NDI (naphthalene diisocyanate) . . . *see* polyurethane
 n-hexane . . . *see* hexane
 Ni . . . *see* nickel
 n-methyl-2-pyrrolidone . . . *see* NMP
 n,n-dimethylformamide . . . *see* DMF
 n-propyl bromide . . . *see* bromopropane
- orthophosphoric acid . . . *see* phosphoric acid
 “ozone-safe” substitutes . . . *see* HCFCs and HFCs
- paint thinner . . . *see* naphtha
 Pb . . . *see* lead
 perc . . . *see* tetrachloroethylene
 perchloroethylene . . . *see* tetrachloroethylene
 petrol . . . *see* gasoline
 petroleum distillates . . . *see* naphtha
 petroleum ether . . . *see* naphtha
 petroleum naphtha . . . *see* naphtha
 phenylethylene . . . *see* styrene
 phenyl hydride . . . *see* benzene
 phenylmethane . . . *see* toluene
 polystyrene . . . *see* styrene
 polyurethane plastic . . . *see* polyurethane
 polyvinyl chloride . . . *see* PVC
 potassium cyanide . . . *see* cyanide
 potassium dichromate . . . *see* chromium
 2-propanol . . . *see* isopropyl alcohol
 2-propanone . . . *see* acetone
 propyl alcohol . . . *see* isopropyl alcohol
 prussic acid . . . *see* cyanide
 PUR plastic . . . *see* polyurethane

quicksilver . . . *see* mercury

resin . . . *see* colophony

rock wool . . . *see* fiberglass and mineral wools

rosin . . . *see* colophony

sand . . . *see* silica

SD alcohol . . . *see* ethyl alcohol

slag wool . . . *see* fiberglass and mineral wools

sodium hydrate . . . *see* sodium hydroxide

spirit of turpentine . . . *see* turpentine

stove oil . . . *see* kerosene

styrene monomer . . . *see* styrene

Styrofoam™ . . . *see* styrene

Styron™ . . . *see* styrene

tailpipe emissions . . . *see* motor exhaust

TCA . . . *see* trichloroethane

TCE . . . *see* trichloroethylene

TCP . . . *see* tricresyl phosphate

TDI (toluene diisocyanate) . . . *see* polyurethane

tetrachloromethane . . . *see* carbon tetrachloride

TOCP . . . *see* tricresyl phosphate

1,1,1-trichloroethane . . . *see* trichloroethane

1,1,2-trichloroethane . . . *see* trichloroethane

trichloromethane . . . *see* chloroform

tri-o-cresyl phosphate . . . *see* tricresyl phosphate

urethane . . . *see* polyurethane

vinyl benzene . . . *see* styrene

vinyl chloride plastic . . . *see* PVC

vinyl trichloride . . . *see* trichloroethane

VM&P naphtha . . . *see* naphtha

white caustic . . . sodium hydroxide

white spirits . . . *see* naphtha

wood alcohol . . . *see* methyl alcohol

wood turpentine . . . *see* turpentine

xylool . . . *see* xylene

zinc chloride . . . *see* zinc

zinc chromate . . . *see* chromium

zinc oxide . . . *see* zinc