

1,4-Dioxane (087)

Version 1

Revision Date 10/07/2009

Print Date 10/07/2009

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : 1,4-Dioxane (087)
MSDS Number : 000000011218
Product Use Description : Solvent

Company : Honeywell International Inc.
1953 South Harvey Street
Muskegon, MI 49442

For more information call : 1-800-368-0050
(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : **Medical: 1-800-498-5701**
: **Transportation: 1-800-424-9300 or +1-703-527-3887**
: (24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : liquid
Color : colourless
Odor : ether-like

Hazard Summary : Flammable. In use, may form flammable/explosive vapour-air mixture. May form explosive peroxides. Harmful by inhalation. May be harmful if swallowed. Irritating to eyes, respiratory system and skin. May cause irritation of the gastrointestinal tract. Repeated exposure may cause skin dryness or cracking. Confirmed animal carcinogen with unknown relevance to humans.

Potential Health Effects

Skin : Irritating to skin.
May be harmful if absorbed through skin.
May cause systemic poisoning with symptoms paralleling those of inhalation.
Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.

Eyes : Irritating to eyes.

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- Causes itching, burning, redness and tearing.
- Ingestion** : May cause irritation of the gastrointestinal tract.
 May cause nausea, vomiting, diarrhea, and abdominal discomfort.
 May cause systemic poisoning with symptoms paralleling those of inhalation.
- Inhalation** : Causes respiratory tract irritation.
 Causes headache, drowsiness or other effects to the central nervous system.
 Vapours may cause drowsiness and dizziness.
 Inhalation of high vapour concentrations can cause CNS-depression and narcosis.
 Causes damage to the following organs: liver, kidneys.
- Chronic Exposure** : Repeated or prolonged exposure to the substance can produce kidney damage.
 Repeated or prolonged exposure to the substance can produce liver damage.
 Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.
 Confirmed animal carcinogen with unknown relevance to humans.
- Aggravated Medical Condition** : Eye disorders
 Skin disorders
 Liver disorders
 Kidney disorders
 Respiratory disorders
- Target Organs** : Eyes
 Skin
 Respiratory system
 Liver
 Kidney

Carcinogenicity

NTP:	1,4 Dioxane	123-91-1
IARC:	1,4 Dioxane	123-91-1
ACGIH:	1,4 Dioxane	123-91-1

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

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Component	CAS-No.	Weight percent
1,4-Dioxane	123-91-1	100.00

SECTION 4. FIRST AID MEASURES

- Inhalation : Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present. Call a physician.
- Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician.
- Ingestion : Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician.

Notes to physician

- Treatment : Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

- Flash point : 12 °C (54 °F)
closed cup
- Ignition temperature : 180 °C (356 °F)
- Lower explosion limit : 2.0 %(V)
- Upper explosion limit : 22 %(V)
- Suitable extinguishing media : Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
Cool closed containers exposed to fire with water spray.
- Extinguishing media which shall not be used for safety reasons : Do not use a solid water stream as it may scatter and spread fire.
- Specific hazards during fire fighting : Flammable.
Vapours may form explosive mixtures with air.

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Vapours are heavier than air and may spread along floors.
Vapors may travel to areas away from work site before igniting/flashing back to vapor source.
May form explosive peroxides.
In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide
Carbon dioxide (CO₂)

Special protective equipment for fire-fighters : Wear self-contained breathing apparatus and protective suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Wear personal protective equipment.
Immediately evacuate personnel to safe areas.
Keep people away from and upwind of spill/leak.
Ensure adequate ventilation.
Remove all sources of ignition.
Do not swallow.
Avoid breathing vapors, mist or gas.
Avoid contact with skin, eyes and clothing.
- Environmental precautions : Prevent further leakage or spillage if safe to do so.
Prevent product from entering drains.
Discharge into the environment must be avoided.
Do not flush into surface water or sanitary sewer system.
Do not allow run-off from fire fighting to enter drains or water courses.
- Methods for cleaning up : Ventilate the area.
No sparking tools should be used.
Use explosion-proof equipment.
Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations (see section 13).

SECTION 7. HANDLING AND STORAGE**Handling**

- Handling : Wear personal protective equipment.
Use only in well-ventilated areas.
Keep container tightly closed.
Do not smoke.
Do not swallow.
Avoid breathing vapors, mist or gas.

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Avoid contact with skin, eyes and clothing.

Advice on protection against fire and explosion : May form explosive peroxides.
 Keep away from fire, sparks and heated surfaces.
 Take precautionary measures against static discharges.
 Ensure all equipment is electrically grounded before beginning transfer operations.
 Use explosion-proof equipment.
 Keep product and empty container away from heat and sources of ignition.
 No sparking tools should be used.
 No smoking.

Storage

Requirements for storage areas and containers : Store in area designed for storage of flammable liquids. Protect from physical damage.
 Keep containers tightly closed in a dry, cool and well-ventilated place.
 Containers which are opened must be carefully resealed and kept upright to prevent leakage.
 Keep away from heat and sources of ignition.
 Keep away from direct sunlight.
 Protect from exposure to air/oxygen (peroxide formation).
 Protect against light.
 Store away from incompatible substances.
 Container hazardous when empty.
 Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Engineering measures : Use with local exhaust ventilation.
 Prevent vapor buildup by providing adequate ventilation during and after use.

Eye protection : Do not wear contact lenses.
 Wear as appropriate:
 Safety glasses with side-shields
 If splashes are likely to occur, wear:
 Goggles or face shield, giving complete protection to eyes

Hand protection : Solvent-resistant gloves
 Gloves must be inspected prior to use.

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- Replace when worn.

Skin and body protection : Wear as appropriate:
 Solvent-resistant apron
 Flame retardant antistatic protective clothing
 If splashes are likely to occur, wear:
 Protective suit
- Respiratory protection : When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.
 For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
 Use NIOSH approved respiratory protection.
- Hygiene measures : When using, do not eat, drink or smoke.
 Wash hands before breaks and immediately after handling the product.
 Keep working clothes separately.
 Remove and wash contaminated clothing before re-use.
 Do not swallow.
 Avoid breathing vapors, mist or gas.
 Avoid contact with skin, eyes and clothing.

Exposure Guidelines

1,4 Dioxane	123-91-1	ACGIH	TWA		20 ppm
		Skin designation: Can be absorbed through the skin.			
		NIOSH	Ceil_Time	1 ppm	3.6 mg/m3
		OSHA Z1	PEL	100 ppm	360 mg/m3
		Skin designation: Can be absorbed through the skin.			
		OSHA Z1A	TWA	25 ppm	90 mg/m3
		Skin designation (Final Rule Limit applies): Can be absorbed through the skin.			
		US CA OEL	TWA PEL	25 ppm	90 mg/m3
		Skin designation: Can be absorbed through the skin.			

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	: liquid
Color	: colourless
Odor	: ether-like
Molecular Weight	: 88.11 g/mol
pH	: no data available
Melting point/range	: 11.8 °C (53.2 °F)
Boiling point/boiling range	: 101.32 °C (214.38 °F)
Vapor pressure	: 39 hPa
Relative vapour density	: 3.0
Density	: 1.034 g/cm ³
Water solubility	: soluble

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	: Heat, flames and sparks. Keep away from direct sunlight. Protect from exposure to air/oxygen (peroxide formation).
Materials to avoid	: Oxidizing agents Reducing agents Acids Bases Oxygen Halogens Decarborane Triethynyl aluminum Plastic materials can be attacked
Hazardous decomposition products	: May form explosive peroxides. In case of fire hazardous decomposition products may be produced such as: Carbon monoxide Carbon dioxide (CO ₂)

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Hazardous reactions : Hazardous polymerisation does not occur.
Stable under recommended storage conditions.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity : LD50 rat
Dose: 5,345 mg/kg

Acute dermal toxicity : LD50 rabbit
Dose: 7,600 mg/kg

Acute inhalation toxicity : LC50 rat
Dose: 46 mg/l
Exposure time: 2 h

Additional advice : Confirmed animal carcinogen with unknown relevance to humans.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity to fish : static test NOEC
Species: Pimephales promelas (fathead minnow)
Dose: 6,000 mg/l

Toxicity to fish : static test LC50
Species: Pimephales promelas (fathead minnow)
Dose: 10,000 mg/l

Additional ecological information : The product evaporates readily.
This chemical is known to leach through soil into ground water under certain conditions.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Information: Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

DOT UN-Number : 1165
Proper shipping name : DIOXANE

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Class	3
Packing group	II
Hazard Labels	3

IATA	UN Number	: 1165
	Description of the goods	: DIOXANE
	Class	: 3
	Packaging group	: II
	Hazard Labels	: 3
	Packing instruction (cargo aircraft)	: 307
	Packing instruction (passenger aircraft)	: 305
	Packing instruction (passenger aircraft)	: Y305

IMDG	Substance No.	: UN 1165
	Description of the goods	: DIOXANE
	Class	: 3
	Packaging group	: II
	Hazard Labels	: 3
	EmS Number	: F-E
	Marine pollutant	: no

SECTION 15. REGULATORY INFORMATION
Inventories

1907/2006 (EU)	: This mixture contains only ingredients which have been subject to a pre-registration according to Regulation (EC) No. 1907/2006 (REACH).
US. Toxic Substances Control Act	: On TSCA Inventory
Australia. Industrial Chemical (Notification and Assessment) Act	: On the inventory, or in compliance with the inventory
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	: All components of this product are on the Canadian DSL list.
Japan. Kashin-Hou Law List	: On the inventory, or in compliance with the inventory
Korea. Toxic Chemical	: On the inventory, or in compliance with the inventory

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Control Law (TCCL) List

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

National regulatory information

SARA 313 Components : 1,4 Dioxane 123-91-1

SARA 311/312 Hazards : Fire Hazard
Acute Health Hazard
Chronic Health Hazard

CERCLA Reportable Quantity : 100 lbs

California Prop. 65 : WARNING! This product contains a chemical known in the State of California to cause cancer.
1,4 Dioxane 123-91-1

Massachusetts RTK : 1,4 Dioxane 123-91-1

New Jersey RTK : 1,4 Dioxane 123-91-1

Pennsylvania RTK : 1,4 Dioxane 123-91-1

WHMIS Classification : B2
D2A
D2B
This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

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SECTION 16. OTHER INFORMATION

	HMIS III	NFPA
Health hazard	: 2*	2
Flammability	: 3	3
Physical Hazard	: 1	
Instability	:	1

Further information

* - Chronic health hazard