

Burdick & Jackson

Material Safety Data Sheet

Tetrahydrofuran

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Tetrahydrofuran

OTHER/GENERIC NAMES: THF, Tetramethylene oxide, Butylene oxide

PRODUCT USE: Solvent

MANUFACTURER: Honeywell, Burdick & Jackson
1953 South Harvey Street
Muskegon, MI 49442

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-368-0050

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
1-800-707-4555 or Chemtrec 1-800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Tetrahydrofuran	109-99-9	~100

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Flammable. Clear, colorless liquid with ether like odor. In common with ethers, unstabilized tetrahydrofuran forms thermally explosive peroxides on exposure to air.

POTENTIAL HEALTH HAZARDS

SKIN: Irritant. Can cause dermatitis.

EYES: Irritant. Can cause blurred vision, tearing and burning sensation.

INHALATION: Irritating to respiratory tract. Can cause nausea, vomiting, disorientation, headache, numbness of the extremities and low blood pressure.

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INGESTION: Can cause sore throat, nausea, intoxication, vomiting, gastrointestinal disorders and possibly coma.

DELAYED EFFECTS: Skin rash can occur. Can cause liver and kidney damage.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS</u>	<u>IARC STATUS</u>	<u>OSHA LIST</u>
No ingredients listed in this section.			

4. FIRST AID MEASURES

SKIN: Rinse affected area with plenty of water until no evidence of chemical remains.
Remove contaminated clothing. Contact a physician.

EYES: Rinse eyes with large amounts of water for at least 15 minutes. Contact a physician..

INHALATION: Remove from exposure area to fresh air. If victim is not breathing administer artificial respiration according to your level of training and obtain professional medical assistance immediately.

INGESTION: Contact a physician. Do not induce vomiting.

ADVICE TO PHYSICIAN: No specific antidote. Treat supportively and symptomatically.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	6°F (-14°C)
FLASH POINT METHOD:	Closed Cup
AUTOIGNITION TEMPERATURE:	610°F (321°C)
UPPER FLAME LIMIT (volume % in air):	11.8%
LOWER FLAME LIMIT (volume % in air):	2%
FLAME PROPAGATION RATE (solids):	Not Applicable
OSHA FLAMMABILITY CLASS:	IB

EXTINGUISHING MEDIA:

Carbon dioxide, dry chemical or foam.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Dangerous fire hazard when exposed to heat or flame. Vapor is heavier than air and danger of flashback exists.

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SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Do not release runoff from fire fighting efforts to sewers or waterways. Fire may produce toxic fumes. Always wear Self Contained Breathing Apparatus.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.) Eliminate sources of ignition. Isolate the spill area. Stop leak in a safe and practical manner. (If leak cannot be stopped easily and safely, advise trained emergency response personnel of the situation.) Using inert material (such as ground corncobs) dike the spilled solvent to prevent it from running into drains or waterways.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.) Flammable liquid and vapors. Keep container closed. Do not breathe vapors. Avoid contact with skin, eyes and mucous membranes. Keep away from heat, sparks and flame. Electrically ground all handling equipment. Protective neoprene or rubber gloves and apron are recommended.

STORAGE RECOMMENDATIONS:

Store in an area designed for storage of flammable liquids. (OSHA 29 CFR 1910.106) Protect from temperature extremes and sunlight, and store away from incompatible substances and in accordance with 29 CFR 1910.106. Avoid acids, bases, oxidizers, explosives, nitrogen-fluorine compounds, sulfites, perchlorates.

Flammable liquid and vapor. Once liquid solvent has been completely dispensed, containers which appear "empty" should be handled in the same manner as when they were "full" of liquid solvent.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide general or local exhaust ventilation systems to maintain airborne concentrations below exposure limits. Local exhaust ventilation is preferred because it prevents contaminant dispersion into the work area by controlling it at its source.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Wear chemically protective gloves, boots and aprons to prevent prolonged or repeated skin contact.

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EYE PROTECTION:

Wear protective eyeglasses or chemical safety goggles, per OSHA eye- and face-protection regulations (*29 CFR 1910.133*). Contact lenses are not eye protective devices.

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RESPIRATORY PROTECTION:

Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, wear a MSHA/NIOSH-approved respirator. For emergency or non-routine operations (cleaning spills, reactor vessels, or storage tanks), wear an SCBA. Warning! Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

ADDITIONAL RECOMMENDATIONS:

Ensure that emergency eyewash stations and washing facilities are available in work area..

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Tetrahydrofuran	200 ppm	200 ppm	none

- * = Limit established by Honeywell International, Inc.
- ** = Workplace Environmental Exposure Level (AIHA).
- *** = Biological Exposure Index (ACGIH).

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS: None

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless
PHYSICAL STATE:	Liquid
MOLECULAR WEIGHT:	72.11
CHEMICAL FORMULA:	C ₄ H ₈ O
ODOR:	Ether like, Odor Threshold: 30 ppm (NIOSH)
SPECIFIC GRAVITY (water = 1.0):	0.888
SOLUBILITY IN WATER (weight %):	100%
pH:	Not Applicable
BOILING POINT:	66°C
MELTING POINT:	-108.5°C
VAPOR PRESSURE:	142 mm/Hg
VAPOR DENSITY (air = 1.0):	2.5
EVAPORATION RATE:	14.5 COMPARED TO: Butyl Acetate = 1
% VOLATILES:	100%
FLASH POINT:	6°F (-14°C)

(Flash point method and additional flammability data are found in Section 5.)

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10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID): Normally stable in closed containers at room temperature under usual and reasonable storage and handling conditions.

INCOMPATIBILITIES: Strong Oxidizers.

CONDITIONS TO AVOID:

Oxidizers, Strong Acids, Heat and other ignition sources.

HAZARDOUS DECOMPOSITION PRODUCTS:

Thermal decomposition can produce carbon monoxide and other hazardous gases. Abnormal storage and use conditions such as exposure to air or direct sunlight can cause explosive peroxides to form.

HAZARDOUS POLYMERIZATION: Not expected to occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

Oral - Rat LD₅₀: 1650 mg/kg

Intraperitoneal - Rat LD₅₀: 2900 mg/kg

Intraperitoneal - Mouse LD₅₀: 1900 mg/kg

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

May cause persistent respiratory irritation and damage to liver and kidneys.

OTHER DATA: None.

12. ECOLOGICAL INFORMATION

96 hour LC₅₀ in fathead minnows = 2160 mg/L

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded? Yes

If yes, the RCRA ID number is: D001, U213

OTHER DISPOSAL CONSIDERATIONS:

Dispose of material in accordance with all applicable local, state, and federal regulations.

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The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT PROPER SHIPPING NAME: Tetrahydrofuran
US DOT HAZARD CLASS: 3, Flammable Liquid
US DOT ID NUMBER: UN2056
US DOT PACKING GROUP: II
NA EMERGENCY RESPONSE GUIDE: 127

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.

15. REGULATORY INFORMATION**TOXIC SUBSTANCES CONTROL ACT (TSCA)**

TSCA INVENTORY STATUS: Listed.

OTHER TSCA ISSUES: None.

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lb)</u>	<u>SARA EHS TPQ (lb)</u>
Tetrahydrofuran	1000 lbs.	Not Listed.

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Acute, Fire, Reactive.

SARA 313 TOXIC CHEMICALS:

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The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME**COMMENT**

No ingredients listed in this section.

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME**WEIGHT %****COMMENT**

No ingredients listed in this section.

ADDITIONAL REGULATORY INFORMATION:

WHMIS CLASSIFICATION (CANADA): Class B, Divisions 2 & 6

FOREIGN INVENTORY STATUS: Not Determined.

16. OTHER INFORMATION

CURRENT ISSUE DATE: June, 2000

PREVIOUS ISSUE DATE: February, 1996, December, 1997

Some grades of B&J Tetrahydrofuran may contain trace amounts (< 200 ppm) of Butylated Hydroxy Toluene which has been added as a preservative to guard against the formation of peroxideable compounds.

NFPA Classification

Health:	2
Flammability:	3
Reactivity:	1

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

Update to ANSI Standard. New header and footer information.