



Material Safety Data Sheet

Version 1.0

Revision Date: 06/02/2015

Print Date: 06/02/2015

Product and Company Identification

Product Name: HoTaq DNA Polymerase (hot start)
Product Use: For Research Use Only. Not for use in diagnostic procedures.
Company: Molecular Cloning Laboratories(MCLAB)
320 Harbor Way
South San Francisco, CA 94080
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Composition and Information on Ingredients

EU labeling and classification: are not subject to the regulations and administrative provisions of European Union Council Directive 92/32/EEC.

EU classification and symbol: This component does not meet the definition of any hazard class as defined by the European Union Council Directive 67/548/EEC or subsequent Directives.

EU risk phrases: Not applicable.

CHEMICAL NAME	CAS #	EINECS#	% v/v	EU CLASSIFICATION FOR COMPONENTS
Ethylenediaminetetraacetic Acid (EDTA)	60-00-4	200-449-4	< 1	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Glycerin	56-81-5	200-289-5	50-60	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Potassium Chloride	7447-40-7	231-211-8	1-5	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Tris(hydroxymethyl)aminomethane Hydrochloride (TRIS-HCl)	1185-53-1	241-648-5	1-5	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.
Water and other low-hazard constituents. The other low-hazard constituents are each present in less than 1 percent in concentration.			Balance	HAZARD CLASSIFICATION: Not applicable. RISK PHRASES: Not applicable.

Hazard Identification

Emergency overview: Product Description: This product is a kit comprised of clear, colorless, odorless liquids.

- Health Hazards: The chief health hazard associated with overexposures during normal use and handling is the potential for mild irritation of contaminated tissue.
- Flammability Hazards: The components of this product are not flammable. In the event of a fire, this product will not contribute significant additional hazards.
- Reactivity Hazards: The components of this product are not reactive.
- Environmental Hazards: Although release of this product is not expected to cause significant harm

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to plants or animals, all contamination to the environment should be avoided.

- Emergency Considerations: Emergency responders should wear appropriate protection for situation to which they respond.

Symptoms of over-exposure by route of exposure: No adverse health effects should occur from routine, occupational use of this material in the manner specified by the manufacturer's instructions. The only likely symptom of exposure would be reddening or inflammation after accidental injection. The potential health effects of the individual components are as follows:

Inhalation: Inhalation of vapors or mists of components of this product may cause mild irritation. Symptoms are generally alleviated upon breathing fresh air.

Contact with skin or eyes: If components of this product contaminate either the skin or the eyes, mild irritation may occur. This irritation will be alleviated upon rinsing. Chronic skin exposure may cause dermatitis (dry, red skin).

Skin absorption: Skin absorption is not a significant route of exposure for any component of this product.

Ingestion: Though not a likely route of occupational exposure, ingestion of this product, especially in large quantities, may cause gastric distress. Symptoms of such over-exposure can include nausea, vomiting, and diarrhea.

Injection: Injection of this product's solutions may cause local reddening, tissue swelling, and discomfort.

Health effects or risks from exposure: An Explanation in Lay Terms. This product's solutions are not known to cause significant acute or chronic health effects.

Acute: Beyond mild irritation of the skin or eyes, contact with this product does not usually cause acute health effects.

Chronic: This product is not known to cause any significant chronic health effects after prolonged exposures.

Target organs: ACUTE: Eyes, skin. CHRONIC: Skin.

First-aid Measures

Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take a copy of label and MSDS to physician or health professional with victim.

Skin exposure: Basic hygiene should prevent any problems. If contact with this product leads to reddening, inflammation, or irritation, flush the exposed area with running water. Remove any contaminated clothing, taking care not to contaminate eyes.

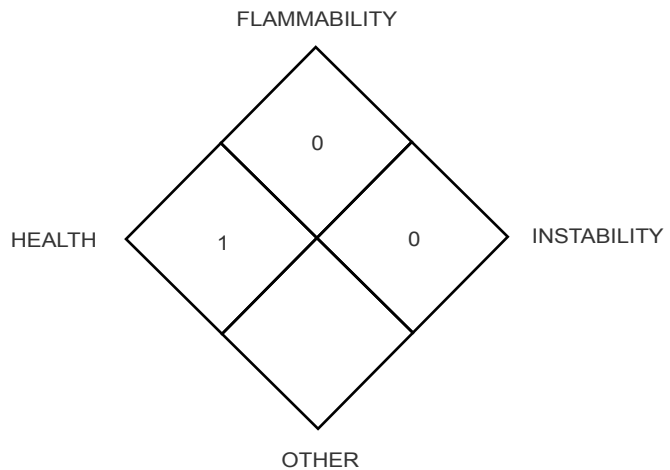
Eye exposure: If liquid or vapors of this product's components enter the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimum flushing is for 15 minutes.

Inhalation: If vapors, mists, or sprays of this product's components are inhaled, causing irritation, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Remove or cover gross contamination to avoid exposure to rescuers.

Ingestion: If this product's components are swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. DO NOT INDUCE VOMITING, unless directed by medical personnel. If conscious, have victim rinse mouth with water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow.

Medical conditions aggravated by exposure: No specific medical conditions are known to be aggravated by exposure to this product.

Recommendations to physicians: Treat symptoms and eliminate overexposure.



Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate
3 = Serious 4 = Severe

Fire-fighting Measures

Flash point: Not applicable.

Autoignition temperature: Not applicable.

Flammable limits (in air by volume, %):

- Lower (LEL): Not applicable.
- Upper (UEL): Not applicable.

Fire extinguishing materials: In the event of a fire, use suppression methods for surrounding materials.

- Water Spray: YES Carbon Dioxide: YES
- Dry Chemical: YES Halon: YES
- Other: Any "ABC" Class Foam: YES.

Unusual fire and explosion hazards: When involved in a fire, this product's solutions may decompose and produce irritating fumes and toxic gases (including carbon monoxide, carbon dioxide, and oxides of nitrogen).

- Explosion Sensitivity to Mechanical Impact: Not sensitive.
- Explosion Sensitivity to Static Discharge: Not sensitive.

Special fire-fighting procedures: Incipient fire responders should wear eye protection.

Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment.

If possible, prevent run-off water from entering storm drains, bodies of water, or other environmentally sensitive areas.

Accidental Release Measures

Spill and leak response: For small releases, treat the product as water, but take basic hygiene precautions. Lightweight gloves, a lab coat, and eye protection should be worn. Absorb spilled liquid with paper towels. Wash contaminated area with soap and water, absorb with paper towels, and rinse with water. Large releases that are not immediately controlled should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area, protect people, and respond with trained personnel. In the event of a non-incident release, minimum Personal Protective Equipment should be Level D: lab-gloves, chemical resistant apron, boots, and splash goggles. Respiratory protection should not be necessary. Absorb spilled liquid with polypads or other suitable absorbent materials. Decontaminate the area thoroughly. Place all spill residue in a suitable container and seal. Dispose of in accordance with U.S. Federal, State, and local hazardous waste disposal regulations, those of Canada and its Provinces and EU Member States (see Section 13, Disposal Considerations).

Handling and Storage

Work practices and hygiene practices: As with all chemicals, avoid getting this product ON YOU or IN YOU. Wash hands after handling this product. Avoid splashing or spraying this product. Do not eat or drink while handling this product.

Storage and handling practices: All employees who handle this material should be trained to handle it safely. Avoid breathing vapors or mists generated by this product. Ensure containers of this product are properly labeled. Open containers slowly on a stable surface. Wash thoroughly after using this material. Store vials as directed in the product insert. Keep vials tightly closed when not in use. Store away from incompatible materials. Inspect vials containing this product for leaks or damage. Read instructions provided with the product prior to use.

Protective practices during maintenance of contaminated equipment: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely, as applicable. Always use this product in areas where adequate ventilation is provided.

Protective practices during maintenance of contaminated equipment (continued): Decontaminate equipment using soapy water before maintenance begins. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures and those of Canada and its Provinces and EU Member States.

Exposure Controls - Personal Protection

Ventilation and engineering controls: Use with adequate ventilation. Follow standard medical product handling procedures. During decontamination of work surfaces, workers should wear the same equipment recommended in Section 6 (Accidental Release Measures) of this MSDS. Eye-wash stations/safety showers should be available near locations where this product is used.

Respiratory protection: A respirator is not required for routine conditions of use of this product. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, and EU member states. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard (1910.134-1998).

Eye protection: Not normally needed during normal use. If necessary, refer to U.S. OSHA 29 CFR 1910.133, the European Standard EN166 and appropriate Standards of Canada for further information.

Hand protection: For situations in which prolonged skin contact is anticipated, double glove, using latex, nitrile, or rubber gloves. Check gloves for leaks. Wash hands before putting on gloves and after removing gloves. If necessary, refer to U.S. OSHA 29 CFR 1910.138, the European Standard DIN EN 374 and the appropriate Standards of Canada.

Body protection: During patient administration, use of light-weight cotton gown or other medical attire is recommended. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136. If necessary, refer to appropriate Standards of Canada or the European DIN EN 465 for other requirements.

Physical and Chemical Properties

RELATIVE VAPOR DENSITY (air = 1): ~ 17 g/m³

SPECIFIC GRAVITY @ 4°C: Approximately 1

SOLUBILITY IN WATER: Completely soluble.

ODOR THRESHOLD: Not available.

VAPOR PRESSURE @ 20°C: ~ 18 mmHg

COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.

APPEARANCE AND COLOR: This product is a kit consisting of clear, colorless, odorless solutions.

HOW TO DETECT THIS SUBSTANCE: There are no unusual warning properties associated with these solutions.

EVAPORATION RATE (nBuAc = 1): 1

FREEZING/MELTING POINT: ~ 0°C (32°F)

BOILING POINT: ~ 100°C (212°F)

pH: 6-8

Toxicological Information

SUSPECTED CANCER AGENT: The constituents in the components of this product are not found on the following lists: NTP, IARC, FEDERAL OSHA Z-List, and CAL-OSHA and therefore are not considered to be, nor suspected to be, cancer causing agents by these agencies.

IRRITANCY OF PRODUCT: While not tested, this product is not expected to cause irritancy to the skin. Mild eye irritation may occur if this product is splashed in the eye.

SENSITIZATION TO THE PRODUCT: The constituents in the components of this product are not known to be human skin or respiratory sensitizers.

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of this product and its constituents on the human reproductive system.

- **Mutagenicity:** The constituents in the components of this product are not reported to produce mutagenic effects in humans. Human mutation data are available for the Glycerin constituent of this product; these data were obtained during clinical studies on specific human tissues exposed to high doses of this compound. Animal mutation data are available for Potassium Chloride (a chemical in this product's solutions); these data were obtained during clinical studies on specific animal tissues exposed to high doses of this compound.
- **Embryotoxicity:** The constituents in the components of this product are not reported to cause human embryotoxic effects. **Teratogenicity:** The constituents in the components of this product are not reported to cause teratogenic effects in humans. Clinical studies on test animals exposed to relatively high doses of Ethylenediaminetetraacetic Acid (EDTA) (a chemical in this product's solutions present in less than 1 percent concentration) indicate teratogenic effects.

REPRODUCTIVE TOXICITY INFORMATION (continued):

Reproductive Toxicity: The constituents in the components of this product are not reported to cause adverse reproductive effects in humans. Clinical studies on test animals exposed to relatively high doses of Ethylenediaminetetraacetic Acid(EDTA) (a chemical in this product's solutions present in less than 1 percent concentration) indicate adverse reproductive effects.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generation lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e. within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, there are no Biological Exposure Indices (BEIs) applicable to the constituents in the components of this product.

Stability and Reactivity

STABILITY: Stable.

DECOMPOSITION PRODUCTS: Carbon dioxide, carbon monoxide, and oxides of nitrogen.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong acids, strong bases, strong oxidizers, water-reactive materials.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Any conditions which are incompatible with water, incompatible chemicals.

Ecological Information

WORK PRACTICES SHOULD BE AIMED AT ELIMINATING ENVIRONMENTAL RELEASES.

ENVIRONMENTAL STABILITY: The components of this product are dilute aqueous solutions that are expected to disperse rapidly in the environment. The following is some environmental data for components.

ETHYLENEDIAMINETETRAACETIC ACID (EDTA): Water Solubility = 500 mg/L, BCF = 19; BCF (bluegill, *Lepomis macrochirus*) = 1. EDTA should not significantly bioconcentrate in aquatic organisms. Biological Oxygen Demand (BOD) = 1%, 5 days. It is expected to persist in the environment and be very slowly biodegraded.

GLYCERIN: Log Kow = -2.6

POTASSIUM CHLORIDE: Water Solubility = 34.2g/ 100 mL (20°C).

EFFECT OF MATERIAL ON PLANTS or ANIMALS: No unusual effects on plants or animals are expected if this product is released into the environment.

EFFECT OF CHEMICAL ON AQUATIC LIFE: This product is not known to cause adverse effects on aquatic life. Additional aquatic toxicity data is available as follows:

ETHYLENEDIAMINETETRAACETIC ACID (EDTA):

- Aquatic toxicity: (immersion, cat fish) = 129 ppm, 96 hr (fresh water)
- Toxicity threshold (cell multiplication inhibition test) *Entosiphon sulcatum* (protozoa)
- Toxicity threshold (cell multiplication inhibition test) *Uronema parduczi*
- *Chatton-Lwoff* (protozoa) = 17 mg/L
- Toxicity threshold (cell multiplication inhibition test) *Scenedesmus quadricauda* (green algae) = 11 mg/L
- Toxicity threshold (cell multiplication inhibition test) *Microcystis aeruginosa* (algae) = 76 mg/L
- Toxicity threshold (cell multiplication inhibition test) *Pseudomonas putida* (bacteria) = 105 mg/L
- LC50 (*Lepomis macrochirus* (bluegill)) = 159 mg/L, 96 hr (no adverse effect level); 100 mg/L (static bioassay)

Disposal Considerations

PREPARING WASTES FOR DISPOSAL: Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority.

EPA WASTE NUMBER: Not applicable to the product.

Transportation Information

THIS PRODUCT IS NOT HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

PROPER SHIPPING NAME: Not Regulated

HAZARD CLASS NUMBER and DESCRIPTION: Not Applicable

UN IDENTIFICATION NUMBER: Not Applicable

PACKING GROUP: Not Applicable

DOT LABEL(S) REQUIRED: Not Applicable

EMERGENCY RESPONSE GUIDEBOOK NUMBER (2004): Not Applicable

MARINE POLLUTANT: The components of this product are not classified by the DOT as a Marine Pollutants (as defined by 49 CFR 172.101, Appendix B).

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS: This product is not classified as hazardous goods, per the regulations of Transport Canada. The components of this product are not designated by the TDG to be Marine Pollutants.

INTERNATIONAL AIR TRANSPORT ASSOCIATION (IATA) DESIGNATION: This product is not classified as dangerous goods, per rules of IATA.

INTERNATIONAL MARITIME ORGANIZATION (IMO): This product is not classified as dangerous goods, per rules of the IMO. The components of this product are not designated by the IMO to be Marine Pollutants.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR): This product is not classified by the United Nations Economic Commission for Europe to be dangerous goods.

Regulatory Information

ADDITIONAL U.S. REGULATIONS:

- U.S. SARA REPORTING REQUIREMENTS: The constituents in the components of this product are not subject to Sections 302, 304, and 313 reporting requirements under the Superfund Amendment and Reauthorization Act.
- U.S. SARA SECTION 302 EXTREMELY HAZARDOUS SUBSTANCE THRESHOLD PLANNING QUANTITY: Not applicable.
- U.S. SARA SECTION 304 EXTREMELY HAZARDOUS SUBSTANCE REPORTABLE QUANTITY: Not applicable.
- U.S. SARA THRESHOLD PLANNING QUANTITY: There are no specific Threshold Planning Quantities for the constituents in the components of this product. The default Federal MSDS submission and inventory requirement filing threshold of 10,000lb (4,540 kg) applies, per 40 CFR 370.20.
- U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.
- U.S. TSCA INVENTORY STATUS: This product is regulated by the Food and Drug Administration; it is exempt from the requirements of TSCA.
- OTHER U.S. FEDERAL REGULATIONS: Not applicable.
- CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): No constituent in the components of this product is on the California Proposition 65 lists.
- ANSI LABELING (Z129.1; Provided to Summarize Occupational Hazard Information): **CAUTION! MAY CAUSE SKIN AND EYE IRRITATION.** Do not taste or swallow. Avoid skin or eye contact. Avoid prolonged or repeated skin contact. Avoid breathing mists or sprays. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Wear gloves and goggles. **FIRST-AID:** In case of contact, immediately flush skin or eyes with plenty of water. If inhaled, remove to fresh air. If ingested, do not induce vomiting. Get medical attention if necessary. **IN CASE OF FIRE:** Use water fog, dry chemical, CO₂, or "alcohol" foam. **IN CASE OF SPILL:** Absorb spill with polypads and place in suitable container. Consult Material Safety Data Sheet for additional information.

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ADDITIONAL CANADIAN REGULATIONS:

- CANADIAN DSL/NDSL STATUS: The constituents in the components of this product are listed on the DSL Inventory or are exempt.
- OTHER CANADIAN REGULATIONS: Not applicable.
- CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA) PRIORITY SUBSTANCES LISTS: The constituents in the components of this product are not on the CEPA Priority Substances Lists.
- CANADIAN WHMIS CLASSIFICATION and SYMBOLS: Not applicable.
- ADDITIONAL EUROPEAN UNION INFORMATION:
- EU LABELING AND CLASSIFICATION: The components of this product do not meet the definition of hazardous, per the European Union Council Directives.

End of MSDS