

Hydroxyethyl starch

sc-215159



The Power is Question

Material Safety Data Sheet

Hazard Alert Code Key: **EXTREME** **HIGH** **MODERATE** **LOW**

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

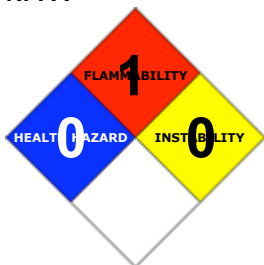
PRODUCT NAME

Hydroxyethyl starch

STATEMENT OF HAZARDOUS NATURE

CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER

Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY

ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS

"C22H44O17, amylopectin, hydroxyethylated", "starch, 2-hydroxyethyl ether", hydroxyethylstarke, O-(hydroxyethyl)starch, "2-hydroxyethyl starch", O-(2-hydroxyethyl)starch, "2-hydroxyethyl starch ether", "starch hydroxyethyl ether", "tapioca starch hydroxyethyl ether", pentastarch, "Essex 1360", "Essex Gum 1360", "Ethylex Gum 2020", HAS, HES, Hespander, "Penford 260, 280, 290, P-208", Plasmasteril, polysaccharide, "glucose polymer"

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability:	1	
Toxicity:	0	
Body Contact:	0	Min/Nil=0 Low=1
Reactivity:	1	Moderate=2
Chronic:	2	High=3 Extreme=4

CANADIAN WHMIS SYMBOLS



EMERGENCY OVERVIEW RISK

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Although ingestion is not thought to produce harmful effects, the material may still be damaging to the health of the individual following ingestion, especially where pre-existing organ (e.

g.

■ Polysaccharides are not substantially absorbed from the gastrointestinal tract but may produce a laxative effect.

Larger doses may produce intestinal obstruction or stomach concretions.

■ Starch has such a low oral acute toxicity that rats given 10-20% of their body weight, show only minimal effects.

This may not be true of modified starches but given their use in foods as stabilisers and thickeners, there is probably little cause for concern.

EYE

■ Although the material is not thought to be an irritant, direct contact with the eye may cause transient discomfort characterized by tearing or conjunctival redness (as with windburn).

Slight abrasive damage may also result.

SKIN

■ The material is not thought to produce adverse health effects or skin irritation following contact (as classified using animal models).

Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

■ Open cuts, abraded or irritated skin should not be exposed to this material.

■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

INHALED

■ The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified using animal models).

Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting.

■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.

CHRONIC HEALTH EFFECTS

■ Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.

There is some evidence that inhaling this product is more likely to cause a sensitization reaction in some persons compared to the general population.

Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.

Studies indicate that diets containing large amounts of non-absorbable polysaccharides, such as cellulose, might decrease absorption of calcium, magnesium, zinc and phosphorus.

Some workers may develop chronic occupational dermatitis (generally mild) through the handling of starch products.

When starch is used as a lubricant in surgical gloves, small amounts, released into the patient during the course of surgery, have resulted in granulomas and peritonitis.

The material may induce local or systemic reactions which are identical or similar to allergic reactions. The mechanism of these pseudo-allergic ("anaphylactoid") response is still largely unknown but does not involve an antigen-antibody interaction and therefore may appear on first contact with the material.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
hetastarch	9005-27-0	>98

Section 4 - FIRST AID MEASURES

SWALLOWED

· Immediately give a glass of water. · First aid is not generally required. If in doubt, contact a Poisons Information Center or a doctor.

EYE

■ If this product comes in contact with eyes: · Wash out immediately with water. · If irritation continues, seek medical attention.

SKIN

■ If skin or hair contact occurs: · Flush skin and hair with running water (and soap if available). · Seek medical attention in event of irritation.

INHALED

· If dust is inhaled, remove from contaminated area. · Encourage patient to blow nose to ensure clear passage of breathing. · If irritation or discomfort persists seek medical attention.

NOTES TO PHYSICIAN

- Treat symptomatically.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG):	Negligible
Upper Explosive Limit (%):	Not available.
Specific Gravity (water=1):	Not available
Lower Explosive Limit (%):	Not available

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.

Combustion products include: carbon monoxide (CO), carbon dioxide (CO₂), other pyrolysis products typical of burning organic material. May emit poisonous fumes.

FIRE INCOMPATIBILITY

- Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

Respirator:

Particulate

Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing dust and contact with skin and eyes.

MAJOR SPILLS

- Moderate hazard.
- CAUTION: Advise personnel in area.
- Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of exposure occurs.
- Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.
- Do NOT cut, drill, grind or weld such containers.
 - In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS

- Glass container.
- Polyethylene or polypropylene container.
- Check all containers are clearly labelled and free from leaks.

STORAGE REQUIREMENTS

- Plastic bag
- NOTE: Bags should be stacked, blocked, interlocked, and limited in height so that they are stable and secure against sliding or collapse.
- Store in original containers.
- Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³	STEL ppm	STEL mg/m ³	Peak ppm	Peak mg/m ³	TWA F/CC	Notes
Canada - Alberta Occupational Exposure Limits	hetastarch (Starch)		10						
US NIOSH Recommended Exposure Limits (RELs)	hetastarch (Starch)		10						(TWA (total))
US - Minnesota Permissible Exposure Limits (PELs)	hetastarch (Starch - Total dust)		15						
Canada - British Columbia Occupational Exposure Limits	hetastarch (Starch)		10 (N)						
US OSHA Permissible Exposure Levels (PELs) - Table Z1	hetastarch (Starch - Respirable fraction)		5						
US OSHA Permissible Exposure Levels (PELs) - Table Z1	hetastarch (Starch - Total dust)		15						
US NIOSH Recommended Exposure Limits (RELs)	hetastarch (Starch)		5						(TWA (resp))
US ACGIH Threshold Limit Values (TLV)	hetastarch (Starch)		10						TLV Basis: dermatitis
US - Minnesota Permissible Exposure Limits (PELs)	hetastarch (Starch - Respirable fraction)		5						
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	hetastarch (Starch - Respirable fraction)		5						
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	hetastarch (Starch - Total dust)		15						
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	hetastarch (Starch - Respirable fraction)		5						
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	hetastarch (Starch - Total dust)		15						

US - Idaho - Limits for Air Contaminants	hetastarch (Starch Respirable fraction)	5	
US - Idaho - Limits for Air Contaminants	hetastarch (Starch Total dust)	15	
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	hetastarch (Starch Respirable fraction)	5	
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	hetastarch (Starch Total dust)	15	
US - Hawaii Air Contaminant Limits	hetastarch (Starch - Respirable fraction)	5	
US - Hawaii Air Contaminant Limits	hetastarch (Starch - Total dust)	10	20
US - Alaska Limits for Air Contaminants	hetastarch (Starch - Respirable fraction)	5	
US - Alaska Limits for Air Contaminants	hetastarch (Starch - Total dust)	15	
US - Washington Permissible exposure limits of air contaminants	hetastarch (Starch - Total particulate)	10	20
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	hetastarch (Starch)	(See Table 11)	
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	hetastarch (Starch)	10	20
US - Washington Permissible exposure limits of air contaminants	hetastarch (Starch - Respirable fraction)	5	10
US - Michigan Exposure Limits for Air Contaminants	hetastarch (Starch, Respirable dust)	5	
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	hetastarch (Starch- Total dust)	15	
Canada - Prince Edward Island Occupational Exposure Limits	hetastarch (Starch)	10	TLV Basis: dermatitis

Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	hetastarch (Starch)		10	
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	hetastarch (Starch- Respirable fraction)		5	
US - Oregon Permissible Exposure Limits (Z-1)	hetastarch (Starch Total Dust)	-	10	Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits.
US - Michigan Exposure Limits for Air Contaminants	hetastarch (Starch, Total dust)		15	
Canada - Nova Scotia Occupational Exposure Limits	hetastarch (Starch)		10	TLV Basis: dermatitis
US - Oregon Permissible Exposure Limits (Z-1)	hetastarch (Starch Respirable Fraction)	-	5	Bold print identifies substances for which the Oregon Permissible Exposure Limits (PELs) are different than the federal Limits.
US - California Permissible Exposure Limits for Chemical Contaminants	hetastarch (Particulates not otherwise regulated Respirable fraction)		5	(n)

ENDOELTABLE

PERSONAL PROTECTION



RESPIRATOR

Particulate
Consult your EHS staff for recommendations

EYE

- Safety glasses with side shields
- Chemical goggles.

HANDS/FEET

- Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: such as:
 - frequency and duration of contact,
 - chemical resistance of glove material,

- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Experience indicates that the following polymers are suitable as glove materials for protection against undissolved, dry solids, where abrasive particles are not present.

- polychloroprene
- nitrile rubber
- butyl rubber
- fluorocautchouc
- polyvinyl chloride

Gloves should be examined for wear and/ or degradation constantly.

OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

ENGINEERING CONTROLS

· Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.

· Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Solid.

Does not mix with water.

State	Divided solid	Molecular Weight	580.57
Melting Range (°F)	Not available.	Viscosity	Not Applicable
Boiling Range (°F)	Not available.	Solubility in water (g/L)	Partly miscible
Flash Point (°F)	Not available	pH (1% solution)	Not applicable
Decomposition Temp (°F)	Not available.	pH (as supplied)	Not applicable
Autoignition Temp (°F)	Not available	Vapour Pressure (mmHG)	Negligible
Upper Explosive Limit (%)	Not available.	Specific Gravity (water=1)	Not available
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	Not applicable
Volatile Component (%vol)	Negligible	Evaporation Rate	Not applicable

APPEARANCE

Powder; dispersible in water forming a paste. Composed of more than 90% amylopectin that has been etherified to the extent that an average of 7 to 8 of the hydroxy groups in each of the 10 D-glucopyranose units of the starch polymer have been converted into hydroxyethyl groups.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

STORAGE INCOMPATIBILITY

- Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

hetastarch

TOXICITY AND IRRITATION

HETASTARCH:

■ unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY

IRRITATION

Oral (rat) LD50: >50000 mg/kg

Nil
Reported

Intraperitoneal (rat) LD50: 300000 mg/kg

Subcutaneous (rat) LD50: >18000 mg/kg

Intravenous (rat) LD50: 11800 mg/kg

Oral (mouse) LD50: >12000 mg/kg

Intraperitoneal (mouse) LD50: 300000 mg/kg

Subcutaneous (mouse) LD50: >18000 mg/kg

Intravenous (mouse) LD50: 20300 mg/kg

Intravenous (rabbit) LD50: 24100 mg/kg

Section 12 - ECOLOGICAL INFORMATION

No data

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions

All waste must be handled in accordance with local, state and federal regulations.

‡ Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.

A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.

DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

· Recycle wherever possible.

· Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS: DOT, IATA, IMDG

Section 15 - REGULATORY INFORMATION

hetastarch (CAS: 9005-27-0) is found on the following regulatory lists;

"Canada Domestic Substances List (DSL)", "US FDA Indirect Food Additives: Adhesives and Components of Coatings - Substances for Use Only as Components of Adhesives - Adhesives", "US Toxic Substances Control Act (TSCA) - Inventory"

Section 16 - OTHER INFORMATION

Reasonable care has been taken in the preparation of this information, but the author makes no warranty of merchantability or any other warranty, expressed or implied, with respect to this information. The author makes no representations and assumes no liability for any direct, incidental or consequential damages resulting from its use. For additional technical information please call our toxicology department on +800 CHEMCALL.

■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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