

# GENERAL HARDNESS (GH) TEST SOLUTION

Chemwatch Material Safety Data Sheet  
Issue Date: Tue 4-Oct-2005

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

GENERAL HARDNESS (GH) TEST SOLUTION

### STATEMENT OF HAZARDOUS NATURE

**CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.**

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

Hardness test solution for products 58 and 34.

### SYNONYMS

"Solution ID# 3338"

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
triethanolamine	102-71-6	10-30
EDTA tetrasodium salt	64-02-8	1-5
water	7732-18-5	>60

## Section 3 - HAZARDS IDENTIFICATION

### CANADIAN WHMIS SYMBOLS



### EMERGENCY OVERVIEW

#### RISK

Irritating to eyes.  
Harmful by inhalation, in contact with skin and if swallowed.  
Cumulative effects may result following exposure\*.

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Possible skin sensitizer\*.  
Exposure may produce irreversible effects\*.

\*(limited evidence)

## POTENTIAL HEALTH EFFECTS

### ACUTE HEALTH EFFECTS

#### SWALLOWED

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

There is some evidence to suggest that this material can cause, if swallowed once, irreversible damage of organs.

#### EYE

This material can cause eye irritation and damage in some persons.

#### SKIN

Skin contact with the material may be harmful; systemic effects may result following absorption.

The material is not thought to be a skin irritant (as classified using animal models). Temporary discomfort, however, may result from prolonged dermal exposures. Good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting.

There is some evidence to suggest that this material, on a single contact with skin, can cause irreversible damage of organs.

Toxic effects may result from skin absorption.

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

Harmful by inhalation.

The material is not thought to produce respiratory irritation (as classified using animal models). Nevertheless inhalation of the material, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress.

Inhalation of vapors or aerosols (mists, fumes), generated by the material during the course of normal handling, may be harmful.

There is some evidence to suggest that this material can cause, if inhaled once, irreversible damage of organs.

#### CHRONIC HEALTH EFFECTS

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure. There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment. There is limited evidence that, skin contact with this product is more likely to cause a sensitization reaction in some persons compared to the general population. Prolonged or chronic exposure to alkanolamines may result in liver, kidney or nervous system injury. Repeated inhalation may aggravate asthma and inflammatory or fibrotic pulmonary disease. Results of repeated exposure tests with diethanolamine (DEA) in laboratory animals include anaemia (rats) and effects on the kidneys (rats and mice) and liver (mice). DEA produces nervous system injury in dogs and rats. Heart and salivary gland lesions have also been seen in mice treated cutaneously with DEA

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and in mice receiving DEA in drinking water. Rats given high doses of DEA developed anaemia and testicular lesions. Exaggerated doses of DEA produced heart and nervous system effects in other animals. Changes in other organs were judged to be secondary due to the poor health of animals subjected to extremely high doses of DEA. Rats, rabbits and guinea pigs exposed to high vapour concentrations of volatile monoethanolamine (MEA) (up to 1250 ppm) for periods of up to 5 weeks developed pulmonary, hepatic and renal lesions. Dogs, rats and guinea pigs exposed to 100 ppm MEA for 30 days, became apathetic and developed poor appetites. Animal tests also indicate that inhalation exposure to MEA may result in nervous system injury. All species exposed to airborne MEA experienced dermal effects, varying from ulceration to hair loss probably resulting from contact with the cage. An increased incidence of skeletal variations, suggestive of a slight developmental delay was seen in the foetuses of rats given 1500 mg/kg/day DEA cutaneously; this also produced significant maternal toxicity. No foetal malformations, however, were seen in rats nor in rabbits receiving identical treatment. The foetus of rats given high doses of MEA by gavage, showed an increased rate of embryofoetal death, growth retardation, and some malformations including hydronephrosis and hydroureter. The high doses required to produce these effects bring into question the relevance of this finding to humans. There is some evidence that embryofoetotoxicity and teratogenicity does not occur in rats when MEA is administered by dermal application to the mother. The National Toxicology Program (NTP) concluded that there is clear evidence of liver tumours and some evidence of kidney tumours in mice exposed dermally to DEA over their lifetime. Chronic skin painting studies in mice of both sexes produced liver tumours and an increased incidence of kidney tumours in male mice. The significance of these findings to humans is unclear as DEA is neither genotoxic, mutagenic nor clastogenic, and did not induce tumours in rats or transgenic mice similarly treated. Alkanolamines (especially those containing a secondary amine moiety) may react with nitrites or other nitrosating agents to form carcinogenic N-nitrosamines. Alkanolamines are metabolised by biosynthetic routes to ethanolamine and choline and incorporated into phospholipids. They are excreted predominantly unchanged with a half-life of approximately one week. In the absence of sodium nitrite, no conversion to carcinogenic N-nitrosamines was observed. Diethanolamine competitively inhibits the cellular uptake of choline, in vitro, and hepatic changes in choline homeostasis, consistent with choline deficiency, are observed in vivo. Many amines are potent skin and respiratory sensitisers and certain individuals especially those described as "atopic" (i.e. those predisposed to asthma and other allergic responses) may show allergic reactions when chronically exposed to alkanolamines. In a study with coconut diethanolamide, the National Toxicology Program (Technical Report Series 479), showed clear evidence of carcinogenic activity in male B6C3F1 mice based on increased incidences of hepatic and renal tubule neoplasms and in female B6C3F1 mice based on increased incidences of hepatic neoplasms. There was equivocal evidence of carcinogenic activity in female F344/N rats based on a marginal increase in the incidence of renal tube neoplasms. These increases were associated with the concentration of free diethanolamine present as a contaminant in the diethanolamine condensate. Exposure to rats to coconut oil diethanolamine condensate by dermal application in ethanol for 2 years resulted in epidermal hyperplasia, sebaceous gland hyperplasia, hyperkeratosis and parakeratosis in males and females and ulcer in females at the site of application. There were increases in the incidences of chronic inflammation, epithelial hyperplasia, and epithelial ulcer in the forestomach of female rats. The severity of nephropathy in dosed female rats were increased. Exposure of mice to coconut oil diethanolamine condensate by dermal application for 2 years resulted in increased incidences of eosinophilic foci of the liver in males. Increased incidences of epidermal hyperplasia, sebaceous gland hyperplasia, and

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hyperkeratosis in males and females, ulcer in males, and parakeratosis and inflammation in females at the site of application and of follicular cell hyperplasia in the thyroid gland of males and females, were chemical related. Injection of EDTA and its salts can cause severe kidney damage with tissue death and internal bleeding, bone marrow depression and critically low levels of calcium.

## Section 4 - FIRST AID MEASURES

### SWALLOWED

- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- Where Medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
- For advice, contact a Poisons Information Center or a doctor.
- Urgent hospital treatment is likely to be needed.
- If conscious, give water to drink.
- INDUCE vomiting with fingers down the back of the throat, ONLY IF CONSCIOUS. Lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- NOTE: Wear a protective glove when inducing vomiting by mechanical means.
- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
- If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.
- If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

### EYE

- If this product comes in contact with the eyes:
- Wash out immediately with fresh running water.
  - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
  - If pain persists or recurs seek medical attention.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### SKIN

- If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear
  - Flush skin and hair with running water (and soap if available).
  - Seek medical attention in event of irritation.

### INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prosthesis such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

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## NOTES TO PHYSICIAN

Treat symptomatically.

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## Section 5 - FIRE FIGHTING MEASURES

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Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

The product contains a substantial proportion of water, therefore there are no restrictions on the type of extinguishing media which may be used. Choice of extinguishing media should take into account surrounding areas. Though the material is non-combustible, evaporation of water from the mixture, caused by the heat of nearby fire, may produce floating layers of combustible substances.

In such an event consider:

- foam
- dry chemical powder
- carbon dioxide.

### FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water course.
- Use fire fighting procedures suitable for surrounding area.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
  - Not considered to be a significant fire risk.
  - Expansion or decomposition on heating may lead to violent rupture of containers.
  - Decomposes on heating and may produce toxic fumes of carbon monoxide (CO).
  - May emit acrid smoke.
- Decomposition may produce toxic fumes of, carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), other pyrolysis products typical of burning organic material.  
May emit poisonous fumes.  
May emit corrosive fumes.

### FIRE INCOMPATIBILITY

None known.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### MINOR SPILLS

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

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## Section 6 - ACCIDENTAL RELEASE MEASURES

- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

Moderate hazard.

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labeled containers for recycling.
- Neutralize/decontaminate residue.
- Collect solid residues and seal in labeled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

### ACUTE EXPOSURE GUIDELINE LEVELS (AEGL) (in ppm)

AEGL 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

### EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:

triethanolamine	500 mg/m <sup>3</sup>
water	500 mg/m <sup>3</sup>

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:

triethanolamine	20 mg/m <sup>3</sup>
water	500 mg/m <sup>3</sup>

other than mild, transient adverse effects without perceiving a clearly defined odour is:

triethanolamine	5 mg/m <sup>3</sup>
water	500 mg/m <sup>3</sup>

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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The threshold concentration below which most people will experience no appreciable risk of health effects:

triethanolamine	5 mg/m <sup>3</sup>
water	500 mg/m <sup>3</sup>

American Industrial Hygiene Association (AIHA)

Ingredients considered according exceed the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T) >= 3.0%
R50 >= 0.25%	Corrosive (C) >= 5.0%
R51 >= 2.5%	
else >= 10%	

where percentage is percentage of ingredient found in the mixture

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## Section 7 - HANDLING AND STORAGE

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### PROCEDURE FOR HANDLING

DO NOT allow clothing wet with material to stay in contact with skin.

DO NOT USE brass or copper containers / stirrers.

Alkanolamines and iron may produced unstable complexes. Monoethanolamine (MEA) and iron form a trisethanolamino-iron complex. This material may spontaneously decompose at temperatures between 130 and 160 degrees C. and is suspected of causing a fire in a nearly empty storage tank containing a "heel" of MEA in contact with carbon steel coils. If steam coil heating is used, low pressure steam in stainless steel coils should be considered. Drum heating should also be reviewed and, where possible, temperatures should be maintained below 130 degrees C.

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Avoid contact with moisture.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.

### RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer
- Check all containers are clearly labeled and free from leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.

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- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>	Peak ppm	Peak mg/m <sup>3</sup>
US California Permissible Exposure Limits for Chemical Contaminants	Triethanolamine	--	5				
Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	Triethanolamine		5		10		
Canadian British Columbia Occupational Exposure Limits	Triethanolamine		5				
No data available:	EDTA tetrasodium salt as (CAS: 64-02-8) / (CAS: 10378-23-1) / (CAS: 13235-36-4)						
No data available:	water as (CAS: 7732-18-5)						

### ODOUR SAFETY FACTOR (OSF)

OSF=0.77 (triethanolamine)

Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odor Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odor Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odor Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities
B	26-550	Idem for 50-90% of persons being distracted
C	1-26	Idem for less than 50% of persons being distracted
D	0.18-1	0-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	Idem for less than 10% of persons aware of being tested

Amoore and Hautala \* have determined that it is only at an OSF value of 26 that

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

50% of distracted persons can detect the substance at the Exposure Standard value. In the case of alerted persons, an OSF of 26 means that 99% of them can detect the odor at the Exposure Standard value. It is ONLY for substances belonging to Class A and B that there is a reasonable chance of being warned in time, that the Exposure Standard is being exceeded. \* Journal Applied

Toxicology: Vol 3, 1983, p272

NOTE: The use of the OSF may be inappropriate for mixtures where substances mask the odor of others.

### EXPOSURE STANDARDS FOR MIXTURE

"Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and concentration:

"Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and concentration:

Composite Exposure Standard for Mixture (TWA) :100 mg/m<sup>3</sup>.

### INGREDIENT DATA

#### TRIETHANOLAMINE:

Exposure at or below the TLV-TWA is thought to minimise the potential for skin and eye irritation, and acute effects (including liver, kidney and nerve damage) and chronic effects (including cancer and allergic contact dermatitis).

#### EDTA TETRASODIUM SALT:

Dusts not otherwise classified, as inspirable dust;  
ES TWA: 10 mg/m<sup>3</sup>.

#### WATER:

No exposure limits set by NOHSC or ACGIH.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

PVC chemical resistant type.

Respirator:

Type AK-P Filter of sufficient capacity

### EYE

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them. DO NOT wear contact lenses.

### HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Wear safety footwear or safety gumboots, eg. Rubber.

NOTE: The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

### OTHER

- Overalls.
- P.V.C. apron.
- Barrier cream.

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

- Skin cleansing cream.
- Eye wash unit.

### RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	AK-1 P	-
1000	50	-	AK-1 P
5000	50	Airline*	-
5000	100	-	AK-2 P
10000	100	-	AK-3 P
	100+		Airline* *

\* - Continuous Flow \*\* - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

### ENGINEERING CONTROLS

Local exhaust ventilation usually required. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection an approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 1.056  
pH (as supplied): 10.7-11.3  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

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## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Dark green alkaline solution with a slight odor; mixes with water.

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

Avoid strong acids, bases.

## Section 11 - TOXICOLOGICAL INFORMATION

### General Hardness (GH) Test Solution

Not available. Refer to individual constituents.

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

#### TRIETHANOLAMINE:

##### TOXICITY

Oral (rat) LD50: 8000 mg/kg  
Oral (rat) LD50: 4920 ul/kg  
Oral (rat) LD50: 5560 mg/kg (calc.)  
Oral (rat) LD50: 4.92 ml/kg (female) \*  
Oral (rat) LD50: 8.57 ml/kg (male) \*  
Dermal (rat) LD50: >16000 mg/kg  
Dermal (rabbit) LD50: 16 ml/kg \*  
Intraperitoneal (rat) LD50: 1510 mg/kg  
Oral (mouse) LD50: 5846 mg/kg  
Intraperitoneal (mouse) LD50: 1450 mg/kg  
Oral (rabbit) LD50: 2200 mg/kg  
Dermal (rabbit) LD50: >20000 mg/kg  
Oral (g.pig) LD50: 2200 mg/kg  
(occluded, male or female)  
Kill rate 1/5 \*

Lachrymation, diarrhoea, convulsions, urinary tract changes, changes in bladder weight, changes in testicular weight, changes in thymus weight, changes in liver weight, dermatitis after systemic exposure, kidney, ureter, bladder tumours recorded.

Equivocal tumourigen by RTECS criteria.

\* Union Carbide

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

NOTE: Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA.

Limited evidence of a carcinogenic effect\*.

##### IRRITATION

Skin (human): 15 mg/3d (int)-mild  
Skin (rabbit): 560 mg/24 hr- mild  
Eye (rabbit): 5.62 mg - SEVERE  
Eye (rabbit): 10 mg - mild  
Eye (rabbit): 0.1 ml -  
minor iritis,  
minor conjunctival irritation  
Skin (rabbit): 4 h occluded  
no irritation \*

with significant discharge;  
no corneal injury \*

#### EDTA TETRASODIUM SALT:

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## Section 11 - TOXICOLOGICAL INFORMATION

### TOXICITY

Oral (rat) LD50: 2000-3200 mg/kg\*  
Eyes (rabbit): 1.9 mg  
Eyes (rabbit): 100 mg/24h-Moderate  
\*[BASF]

### IRRITATION

Skin (rabbit): 500 mg/24h-Moderate

### WATER:

#### TOXICITY

No significant acute toxicological data identified in literature search.

#### IRRITATION

## Section 12 - ECOLOGICAL INFORMATION

DO NOT discharge into sewer or waterways.  
Refer to data for ingredients, which follows:

### TRIETHANOLAMINE:

Fish LC50 (96hr.) (mg/l): 3500 (24hr)  
Daphnia magna EC50 (48hr.) (mg/l): 2.5  
Algae IC50 (72hr.) (mg/l): 1.8-47  
log Kow (Sangster 1997): -1  
log Pow (Verschueren 1983): 0.75428571  
BOD20: 6.20%  
ThOD: 2.04

log Kow : -1.32- -1.75

Koc : 3

Half-life (hr) air : 4

Henry's atm m<sup>3</sup> /mol: 3.38E-19

BOD 5 if unstated: nil-0.17

COD : 1.5

ThOD : 2.04; 1.61 p/p

ThOD (measured) 1.52 mg/mg (Union Carbide)

ThOD (calculated) 1.61 mg/mg (Union Carbide)

BCF : <1

Biodegradability:

96% DOC reduction (OECD Method 301E)

BOD

Day 5: 8%

Day 10: 9%

Day 20: 66%

Passes Sturm, AFNOR tests for biodegradability.

Reaches more than 70% mineralisation in OECD test for inherent biodegradability (Zahn-Wellens test)

Theoretical oxygen demand ThOD) is calculated at 1.61 p/p. Degradation is expected in the atmospheric environment within minutes to hours.

Material is practically non-toxic to aquatic organisms on an acute basis (LC50 >100 mg/l in most sensitive species)

Fish LC50 (96 h): fathead minnow (*Pimephales promelas*) 1800-11800 mg/l

fathead minnow 5600 mg/l (Union Carbide)

bluegill (*Leuciscus idus*) 7930 mg/l

goldfish (*Carrassius auratus*) 5000 mg/l

Daphnia magna LC50 (24 h): 1390 - 2038 mg/l

Daphnia magna LC50 (48 h): 947 mg/l (Union Carbide)

Algae LC50 (48 h): 750 mg/l

Brine shrimp LC50: (*Artemia salina*) 5600 mg/l

continued...

# GENERAL HARDNESS (GH) TEST SOLUTION

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Section 12 - ECOLOGICAL INFORMATION

Maximum acceptable toxicant concentration (MATC): 22 mg/l  
Algal growth inhibition (*Scenedesmus subspicatus*) EC50: 470-750 mg/l  
Inhibition of bacteria in effluent: 50% inhibition: >10000 mg/l  
Inhibitory concentration (IC50) is OECD "Activated Sludge, Respiration Inhibition Test" (Guideline 209) is >1000 mg/l. Material has shown a potential to biodegrade. Attains >99% degradation in activated sludge in 24 hours. Attains >99% degradation in soil is 1-14 days.  
Bioconcentration potential is low (BCF less than 100 or log Kow less than 3). Log octanol/ water partition coefficient (log Kow) is estimated using the Pomona-Medchem structural fragment to be -1.746. Potential for the mobility in soil is very high (Koc between 0 and 50).  
Henry's Law Constant (H) is estimated to be 3.38E-19 atm.m<sup>3</sup>/mol (25 C)  
Log soil organic carbon partition coefficient (log Koc) is estimated to be 0.48.  
When released into soil the material is expected to degrade without significant evaporation. A half-life of between 1 to 10 days is expected. When released into water, the material is expected to degrade with a half-life of about 1 to 10 days. Because the material has a log octanol-water coefficient of less than 3 it is not expected to bioaccumulate. Release to air is expected to produce photolytic degradation resulting in hydroxyl radicals. The material is expected to be removed from the atmosphere by dry and wet deposition (half-life between 1 and 10 days).

## EDTA TETRASODIUM SALT:

Not readily biodegradable. Harmful to aquatic organisms.  
May cause long term adverse effects in the aquatic environment.  
Toxicity to fish: LC50 (96h): >500 mg/l (*Leuciscus idus*)  
Toxicity to daphnae (acute): EC50 (48h): >100 mg/l  
Toxicity to algae EC50 (72h): 10-100 mg/l  
COD Value: 570 mg O<sub>2</sub>/g  
BOD5-Value: 20 mg O<sub>2</sub>/g  
Toxicity to bacteria: 50 mg/l Warburg test

[ORICA]

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## Section 13 - DISPOSAL CONSIDERATIONS

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### Disposal Instructions

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

- 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.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

Puncture containers to prevent re-use and bury at an authorized landfill.

continued...

# GENERAL HARDNESS (GH) TEST SOLUTION

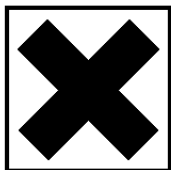
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## Section 14 - TRANSPORTATION INFORMATION

DOT Information  
Shipping Name: None  
Hazard Class: None  
SubRisk: None  
UN/NA Number: None  
Packing Group: None  
Additional Shipping Information:  
International Transport Regulations:  
IMO: None

## Section 15 - REGULATORY INFORMATION



### RISK

Harmful by inhalation, in contact with skin and if swallowed.  
Irritating to eyes.

### US Federal Regulations

#### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

#### B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A)

SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4): None

-----  
Component                      TSCA  
triethanolamine                Y  
EDTA tetrasodium salt        Y

### State Regulations

#### A. General Product Information

#### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component	CAS No	CA	FL	MA	MN	NJ	PA
triethanolamine	102-71-6	N	Y	Y	Y	N	Y
EDTA tetrasodium salt	64-02-8	N	N	N	N	N	N

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

continued...

# GENERAL HARDNESS (GH) TEST SOLUTION

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Section 15 - REGULATORY INFORMATION

## Other Regulations

### A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

### B. Component Information

#### CANADA

The following component(s) are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS No	%	Min Conc.
triethanolamine	102-71-6	10-30	1% item 1621 (1663)

All of this product's components are on the Canadian Domestic

## REGULATIONS

triethanolamine (CAS: 102-71-6) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US TSCA Section 8 (d) - Health and Safety Data Reporting

US EPA Other (Inert) Pesticide Ingredients in Pesticide Products, List 2:

Potentially Toxic Other Ingredients/High Priority for Testing inerts

US Minnesota Hazardous Substance List

US EPA High Production Volume Program Chemical List

Canadian Ingredient Disclosure List (SOR/88-64)

US DOE Temporary Emergency Exposure Limits (TEELs)

US Food Additive Database

Canada Saskatchewan Occupational Health and Safety Regulations - Contamination Limits

US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

EDTA tetrasodium salt (CAS: 64-02-8) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US EPA High Production Volume Program Chemical List

US DOE Temporary Emergency Exposure Limits (TEELs)

US Food Additive Database

US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

EDTA tetrasodium salt (CAS: 10378-23-1) is found on the following regulatory lists

US DOE Temporary Emergency Exposure Limits (TEELs)

US California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Respiratory

water (CAS: 7732-18-5) is found on the following regulatory lists

Canadian Domestic Substances List (DSL)

US Toxic Substances Control Act (TSCA)

US DOE Temporary Emergency Exposure Limits (TEELs)

US Californian Proposition 65 - Priority List for the Development of MADLs for Chemicals Causing Reproductive Toxicity

No data available for EDTA tetrasodium salt as CAS: 13235-36-4.

continued...

# GENERAL HARDNESS (GH) TEST SOLUTION

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## Section 16 - OTHER INFORMATION

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Issue Date: Tue 4-Oct-2005  
Print Date: Thu 6-Oct-2005

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# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

---

### PRODUCT NAME

CARBONATE HARDNESS (KH) TEST SOLUTION

### STATEMENT OF HAZARDOUS NATURE

Not considered a hazardous substance according to OSHA 29  
CFR 1910.1200.

### SUPPLIER

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
50 East Hamilton Street  
Chalfont  
PA, 18914  
USA  
Telephone: +1 215 822 8181

Company: Aquarium Pharmaceuticals Incorporated  
Address:  
PO Box 218  
Chalfont  
PA, 18914-0218  
USA  
Telephone: +1 215 822 8181  
Emergency Tel: +1800 222 1222 (US Only)

### PRODUCT USE

Test solution for products 34P, 58 and 59.

### SYNONYMS

"Solution ID# 3339"

---

## Section 2 - COMPOSITION / INFORMATION ON INGREDIENTS

---

NAME	CAS RN	%
non hazardous ingredients		100

---

## Section 3 - HAZARDS IDENTIFICATION

---

### CANADIAN WHMIS SYMBOLS

None

### EMERGENCY OVERVIEW

#### RISK

### POTENTIAL HEALTH EFFECTS

#### ACUTE HEALTH EFFECTS

#### SWALLOWED

The material has NOT been classified as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence. The material may still be damaging to the health of the individual, following ingestion, especially where pre-existing organ (e.g. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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Section 3 - HAZARDS IDENTIFICATION

(death) rather than those producing morbidity (disease, ill-health).  
Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, unintentional ingestion is not thought to be cause for concern.

## EYE

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

## 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.

## 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.

## CHRONIC HEALTH EFFECTS

Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified using animal models); nevertheless exposure by all routes should be minimized as a matter of course.

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## 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.
  - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

### 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 fumes or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

### NOTES TO PHYSICIAN

Treat symptomatically.

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 5 - FIRE FIGHTING MEASURES

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Flash Point (°F): Not Applicable  
Lower Explosive Limit (%): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Autoignition Temp (°F): Not Applicable

### EXTINGUISHING MEDIA

- There is no restriction on the type of extinguisher which may be used.  
Use extinguishing media suitable for surrounding area.

### FIRE FIGHTING

- Use water delivered as a fine spray to control fire and cool adjacent area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

### GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Non combustible.
- Not considered to be a significant fire risk.
- Expansion or decomposition on heating may lead to violent rupture of containers.
- Decomposes on heating and may produce toxic/ irritating fumes.
- May emit acrid smoke.

### FIRE INCOMPATIBILITY

None known.

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## Section 6 - ACCIDENTAL RELEASE MEASURES

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### MINOR SPILLS

- Clean up all spills immediately.
- Avoid breathing vapors and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb spill with sand, earth, inert material or vermiculite.
- Wipe up.
- Place in a suitable labeled container for waste disposal.

### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.
- Control personal contact by using protective equipment.
- Prevent spillage from entering drains, sewers or water courses.
- Recover product wherever possible.
- Put residues in labeled containers for disposal.
- If contamination of drains or waterways occurs, advise emergency services.

## ACUTE EXPOSURE GUIDELINE LEVELS (AEG) (in ppm)

AEG 1: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 6 - ACCIDENTAL RELEASE MEASURES

---

experience notable discomfort, irritation, or certain asymptomatic nonsensory effects. However, the effects are not disabling and are transient and reversible upon cessation of exposure.

AEGL 2: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience irreversible or other serious, long-lasting adverse health effects or an impaired ability to escape.

AEGL 3: The airborne concentration of a substance above which it is predicted that the general population, including susceptible individuals, could experience life-threatening health effects or death.

---

## Section 7 - HANDLING AND STORAGE

---

### PROCEDURE FOR HANDLING

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

### RECOMMENDED STORAGE METHODS

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer
- Check all containers are clearly labeled and free from leaks.

### STORAGE REQUIREMENTS

- Store in original containers.
  - Keep containers securely sealed.
  - Store in a cool, dry, well-ventilated area.
  - Store away from incompatible materials and foodstuff containers.
  - Protect containers against physical damage and check regularly for leaks.
  - Observe manufacturer's storing and handling recommendations.
- Segregate from alkalis, oxidizing agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.
- 

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### EXPOSURE CONTROLS

Not available. Refer to individual constituents.

### PERSONAL PROTECTION

Glasses:

Chemical goggles.

Gloves:

When handling larger quantities:

General purpose rubber glove.

Respirator:

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

---

### EYE

- Safety glasses with side shields; or as required,
- Chemical goggles.
- Contact lenses pose a special hazard; soft lenses may absorb irritants and all lenses concentrate them.

### HANDS/FEET

Wear general protective gloves, e.g.. light weight rubber gloves.

### OTHER

No special equipment needed when handling small quantities.

#### OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

Use appropriate NIOSH-certified respirator based on informed professional judgement. In conditions where no reasonable estimate of exposure can be made, assume the exposure is in a concentration IDLH and use NIOSH-certified full face pressure demand SCBA with a minimum service life of 30 minutes, or a combination full facepiece pressure demand SAR with auxiliary self-contained air supply. Respirators provided only for escape from IDLH atmospheres shall be NIOSH-certified for escape from the atmosphere in which they will be used.

## ENGINEERING CONTROLS

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear an approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas.

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## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

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### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not Applicable  
Melting Range (°C): Not Available  
Solubility in water (g/L): Miscible  
pH (1% solution): Not Available  
Volatile Component (%vol): Not Available  
Relative Vapor Density (air=1): Not Available  
Lower Explosive Limit (%): Not Applicable  
Autoignition Temp (°C): Not Applicable  
State: Liquid

Boiling Range (°C): Not Available  
Specific Gravity (water=1): 0.997 approx.  
pH (as supplied): 1.20-1.45  
Vapor Pressure (kPa): Not Available  
Evaporation Rate: Not Available  
Flash Point (°C): Not Applicable  
Upper Explosive Limit (%): Not Applicable  
Decomposition Temp (°C): Not Available

### APPEARANCE

Reddish orange solution with no odor; mixes with water.

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

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### CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerization will not occur.

### STORAGE INCOMPATIBILITY

Avoid contamination of water, foodstuffs, feed or seed.  
Avoid storage with highly alkaline solutions.

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## Section 11 - TOXICOLOGICAL INFORMATION

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### Carbonate Hardness (KH) Test Solution

Not available. Refer to individual constituents.  
unless otherwise specified data extracted from RTECS - Register of Toxic Effects  
of Chemical Substances

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## Section 12 - ECOLOGICAL INFORMATION

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## Section 13 - DISPOSAL CONSIDERATIONS

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### Disposal Instructions

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

- 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.
- Dispose of by: Burial in a licensed land-fill or Incineration in a licensed apparatus (after admixture with suitable combustible material)
- Decontaminate empty containers. Observe all label safeguards until containers are cleaned and destroyed.

---

## Section 14 - TRANSPORTATION INFORMATION

---

DOT Information  
Shipping Name: None  
Hazard Class: None  
SubRisk: None  
UN/NA Number: None  
Packing Group: None  
Additional Shipping Information:  
International Transport Regulations:  
IMO: None

continued...

# CARBONATE HARDNESS (KH) TEST SOLUTION

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## Section 15 - REGULATORY INFORMATION

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### RISK

#### US Federal Regulations

##### A. General Product Information

In addition to Federal and State regulation, local regulations may apply. Check with your local regulatory authorities.

##### B. Component Information

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 455 Appendix A)

SARA Section 313 (40 CFR 372.65) and/or CERCLA (40 CFR 302.4): None

-----  
Component TSCA

#### State Regulations

##### A. General Product Information

##### B. Component Information

The following components appear on one or more of the following state hazardous substance lists.

Component CAS No CA FL MA MN NJ PA

Y=Yes this material appears on that state's hazardous substances list.

N=No this material does not appear on that state's hazardous substances list.

#### Other Regulations

##### A. General Product Information

All components are listed in the European Inventory of New and Existing Chemical Substances (EINECS)

##### B. Component Information

CANADA

All of this product's components are on the Canadian Domestic

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## Section 16 - OTHER INFORMATION

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Issue Date: Mon 3-Oct-2005

Print Date: Thu 6-Oct-2005

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