# GENERAL HARDNESS (GH) TEST SOLUTION



## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME**
GENERAL HARDNESS (GH) TEST SOLUTION

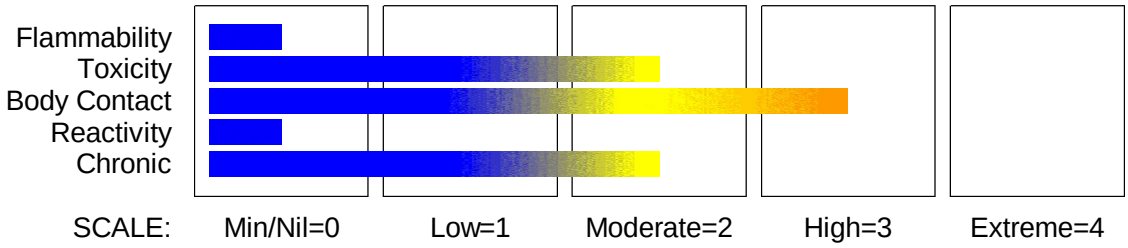
**OTHER NAMES**
"Solution ID# 3338"

**PRODUCT USE**
Hardness test solution for products 58 and 34.

**SUPPLIER**
Company: Mars Fishcare Inc
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181
Fax: +1 215 822 1906

## Section 2 - HAZARDS IDENTIFICATION

**CHEMWATCH HAZARD RATINGS**




**GHS Classification**
Acute Aquatic Hazard Category 3
Acute Toxicity (Dermal) Category 4
Acute Toxicity (Inhalation) Category 4
Acute Toxicity (Oral) Category 4
Respiratory Irritation Category 3
Serious Eye Damage Category 1
Skin Corrosion/Irritation Category 2
Skin Sensitizer Category 1

**continued...**

**EMERGENCY OVERVIEW**

**HAZARD**
DANGER
Determined by Chemwatch using GHS criteria:
H335 H302 H312 H332 H315 H317 H318 H402 H315 H318
May cause respiratory irritation
Harmful if swallowed
Harmful in contact with skin
Harmful if inhaled
Causes skin irritation
May cause allergic skin reaction
Causes serious eye damage
Harmful to aquatic life
Causes skin irritation
Causes serious eye damage

**PRECAUTIONARY STATEMENTS**

**Prevention**
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.

**Response**
IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor/physician.
Call a POISON CENTER or doctor/physician if you feel unwell.
Rinse mouth.
If skin irritation or rash occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.

**Storage**
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

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## Section 3 - 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 4 - FIRST AID MEASURES

**SWALLOWED**
- IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.
- For advice, contact a Poisons Information Centre or a doctor.
- Urgent hospital treatment is likely to be needed.
- 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.
- Where medical attention is not immediately available or where the patient is more than 15 minutes from a hospital or unless instructed otherwise:
- 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.

**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.
- Seek medical attention without delay; 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.
- Prostheses 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.

**NOTES TO PHYSICIAN**
■ Treat symptomatically.

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## Section 5 - FIRE FIGHTING MEASURES

**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/EXPLOSION HAZARD**
• 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 ($CO_2$), nitrogen oxides (NOx), other pyrolysis products typical of burning organic material.
May emit poisonous fumes.
May emit corrosive fumes.

**FIRE INCOMPATIBILITY**
■ None known.

**Personal Protective Equipment**
Gas tight chemical resistant suit.

## Section 6 - ACCIDENTAL RELEASE MEASURES

**MINOR SPILLS**
• Clean up all spills immediately.
• Avoid breathing vapours 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, labelled container for waste disposal.

**Personal Protective Equipment advice is contained in Section 8 of the MSDS.**

## Section 7 - HANDLING AND STORAGE

**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

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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.

**SUITABLE CONTAINER**

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled 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.

**SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS**

| | | | | | |
|---|---|---|---|---|---|
| + | X | + | X | X | + |

*+: May be stored together*
*O: May be stored together with specific preventions*
*X: Must not be stored together*

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE CONTROLS**

US OSHA Permissible Exposure Levels ( PELs)

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**Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION**

| Z | Material | TWA ppm | TWA mg/m³ | STEL ppm | STEL mg/m³ | Peak ppm | Peak mg/m³ | Max excursion ppm | Max excursion mg/m³ | Max excursion duration (mins) | TWA F/CC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Z3 | Inert or Nuisance Dust: (d) Respirable fraction | | 5 | | | | | | | | |
| Z3 | Inert or Nuisance Dust: (d) Total dust | | 15 | | | | | | | | |

| Source | Material | TWA ppm | TWA mg/m³ | STEL mg/m³ | Notes |
|---|---|---|---|---|---|
| Canada - British Columbia Occupational Exposure Limits | triethanolamine (Triethanolamine) | | 5 | | |
| Canada - Alberta Occupational Exposure Limits | triethanolamine (Triethanolamine) | | 5 | | |
| US - California Permissible Exposure Limits for Chemical Contaminants | triethanolamine (Triethanolamine) | | 5 | | |
| Canada - Ontario Occupational Exposure Limits | triethanolamine (Triethanolamine) | 0.5 | 3.1 | | |
| US ACGIH Threshold Limit Values (TLV) | triethanolamine (Triethanolamine) | | 5 | | TLV Basis: eye & skin irritation |
| Canada - Nova Scotia Occupational Exposure Limits | triethanolamine (Triethanolamine) | | 5 | | TLV Basis: eye & skin irritation |
| Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits | triethanolamine (Triethanolamine) | | 5 | 10 | |
| Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English) | triethanolamine (Triethanolamine) | | 5 | | |
| Canada - Prince Edward Island Occupational Exposure Limits | triethanolamine (Triethanolamine) | | 5 | | TLV Basis: eye & skin irritation |
| US - Oregon Permissible Exposure Limits (Z3) | EDTA tetrasodium salt (Inert or Nuisance Dust: (d) Total dust) | | 10 | | * |
| US OSHA Permissible Exposure Levels (PELs) - Table Z3 | EDTA tetrasodium salt (Inert or Nuisance Dust: (d) Respirable fraction) | | 5 | | |
| US OSHA Permissible Exposure Levels (PELs) - Table Z3 | EDTA tetrasodium salt (Inert or Nuisance Dust: (d) Total dust) | | 15 | | |

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| Source | Material | TWA ppm | TWA mg/m³ | STEL mg/m³ | Notes |
|---|---|---|---|---|---|
| US - Hawaii Air Contaminant Limits | EDTA tetrasodium salt (Particulates not other wise regulated - Total dust) | | 10 | | |
| US - Hawaii Air Contaminant Limits | EDTA tetrasodium salt (Particulates not other wise regulated - Respirable fraction) | | 5 | | |
| US - Oregon Permissible Exposure Limits (Z3) | EDTA tetrasodium salt (Inert or Nuisance Dust: (d) Respirable fraction) | | 5 | | * |
| US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants | EDTA tetrasodium salt (Particulates not otherwise regulated Respirable fraction) | | 5 | | |
| US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants | EDTA tetrasodium salt (Particulates not otherwise regulated (PNOR)(f)- Respirable fraction) | | 5 | | |
| US - Michigan Exposure Limits for Air Contaminants | EDTA tetrasodium salt (Particulates not otherwise regulated, Respirable dust) | | 5 | | |

The following materials had no OELs on our records
• water: CAS:7732- 18- 5

**MATERIAL DATA**
TRIETHANOLAMINE:
■ Not available. Refer to individual constituents.

EDTA TETRASODIUM SALT:
■ for 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).
Odour Safety Factor (OSF)
OSF=0.77 (triethanolamine).
for diethanolamine:
Odour Threshold: 2.6 ppm
The TLV-TWA is thought to be protective against the significant risk of eye damage and skin irritation.
Odour Safety Factor (OSF)
OSF=1.7 (DIETHANOLAMINE).
for monoethanolamine:
Odour threshold: 3-4 ppm.
Continuous exposure at 5 ppm produced only slight systemic effects. Intermittent exposure produces a lesser degree of toxicity in laboratory animals. This decreased toxicity is related to the rate of elimination;
the longer retained, the greater the toxicity,. The TLV-TWA is thought to be protective against the risk

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of irritation and neuropathic effects.
Odour Safety Factor (OSF)
OSF=0.77 (ETHANOL AMINE).

WATER:
■ It is the goal of the ACGIH (and other Agencies) to recommend TLVs (or their equivalent) for all substances for which there is evidence of health effects at airborne concentrations encountered in the workplace.
At this time no TLV has been established, even though this material may produce adverse health effects (as evidenced in animal experiments or clinical experience). Airborne concentrations must be maintained as low as is practically possible and occupational exposure must be kept to a minimum.
NOTE: The ACGIH occupational exposure standard for Particles Not Otherwise Specified (P.N.O.S) does NOT apply.
Sensory irritants are chemicals that produce temporary and undesirable side-effects on the eyes, nose or throat. Historically occupational exposure standards for these irritants have been based on observation of workers' responses to various airborne concentrations. Present day expectations require that nearly every individual should be protected against even minor sensory irritation and exposure standards are established using uncertainty factors or safety factors of 5 to 10 or more. On occasion animal no-observable-effect-levels (NOEL) are used to determine these limits where human results are unavailable. An additional approach, typically used by the TLV committee (USA) in determining respiratory standards for this group of chemicals, has been to assign ceiling values (TLV C) to rapidly acting irritants and to assign short-term exposure limits (TLV STELs) when the weight of evidence from irritation, bioaccumulation and other endpoints combine to warrant such a limit. In contrast the MAK Commission (Germany) uses a five-category system based on intensive odour, local irritation, and elimination half-life. However this system is being replaced to be consistent with the European Union (EU) Scientific Committee for Occupational Exposure Limits (SCOEL); this is more closely allied to that of the USA.
OSHA (USA) concluded that exposure to sensory irritants can:
• cause inflammation
• cause increased susceptibility to other irritants and infectious agents
• lead to permanent injury or dysfunction
• permit greater absorption of hazardous substances and
• acclimate the worker to the irritant warning properties of these substances thus increasing the risk of overexposure.

**PERSONAL PROTECTION**




**EYE**
• Safety glasses with side shields.
• Chemical goggles.
• Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers

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have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

**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.
• Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

**OTHER**
• Overalls.
• P.V.C. apron.
• Barrier cream.
• 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- AUS P | - |
| 1000 | 50 | - | AK- AUS 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. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

**ENGINEERING CONTROLS**
■ Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.
An approved self contained breathing apparatus (SCBA) may be required in some situations.
Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

| Type of Contaminant: | Air Speed: |
|---|---|
| solvent, vapours, degreasing etc., evaporating from tank (in still air). | 0.25- 0.5 m/s (50- 100 f/min.) |

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| | |
|---|---|
| aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation) | 0.5- 1 m/s (100- 200 f/min.) |
| direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion) | 1- 2.5 m/s (200- 500 f/min.) |
| grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion). | 2.5- 10 m/s (500- 2000 f/min.) |

Within each range the appropriate value depends on:

| Lower end of the range | Upper end of the range |
|---|---|
| 1: Room air currents minimal or favourable to capture | 1: Disturbing room air currents |
| 2: Contaminants of low toxicity or of nuisance value only. | 2: Contaminants of high toxicity |
| 3: Intermittent, low production. | 3: High production, heavy use |
| 4: Large hood or large air mass in motion | 4: Small hood- local control only |

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE**
Dark green alkaline solution with a slight odour; mixes with water.

**PHYSICAL PROPERTIES**
Liquid.
Mixes with water.

| | | | |
|---|---|---|---|
| State | Liquid | Molecular Weight | Not Applicable |
| Melting Range (°F) | Not Available | Viscosity | Not Available |
| Boiling Range (°F) | Not Available | Solubility in water (g/L) | Miscible |
| Flash Point (°F) | Not Applicable | pH (1% solution) | Not Available |
| Decomposition Temp (°F) | Not Available | pH (as supplied) | 10.7- 11.3 |
| Autoignition Temp (°F) | Not Applicable | Vapour Pressure (mmHG) | Not Available |
| Upper Explosive Limit (%) | Not Applicable | Specific Gravity (water=1) | 1.056 |

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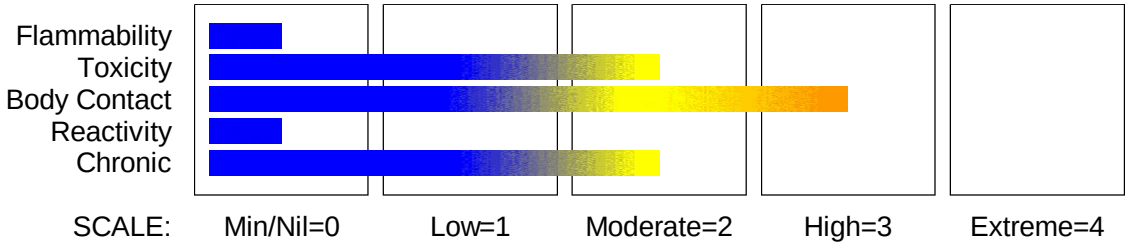
| | | | |
|---|---|---|---|
| Lower Explosive Limit (%) | Not Applicable | Relative Vapour Density (air=1) | Not Available |
| Volatile Component (%vol) | Not Available | Evaporation Rate | Not Available |

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

**CONDITIONS CONTRIBUTING TO INSTABILITY**
• Presence of incompatible materials.
• Product is considered stable.
• Hazardous polymerisation will not occur.
*For incompatible materials - refer to Section 7 - Handling and Storage.*

## Section 11 - TOXICOLOGICAL INFORMATION

**CHEMWATCH HAZARD RATINGS**




**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**
■ If applied to the eyes, this material causes severe eye damage.
■ 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.
■ This material can cause inflammation of the skin oncontact in some persons.
■ 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**
■ If inhaled, this material can irritate the throat andlungs of some persons.
■ Inhalation of vapours or aerosols (mists, fumes), generated by the material during the course of normal

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handling, may be harmful.
■ There is some evidence to suggest that this materialcan cause, if inhaled once, irreversible damageof 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 sensitisation 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 lung disease involving inflammation or scarring.
Results of animal testing with diethanolamine (DEA) and monoethanolamine (MEA) has shown a wide range of possible effects, including induction of tumours, developmental abnormalities and injury to the foetus and mother.
Many amines greatly sensitise the skin and respiratory system, and certain individuals, especially those predisposed to asthma and other allergic responses, may show allergic reactions when chronically exposed to alkanolamines.
Injection of EDTA and it salts can cause severe kidney damage with tissue death and internal bleeding, bone marrow depression and critically low levels of calcium.

**TOXICITY AND IRRITATION**
■ Not available. Refer to individual constituents.

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

| TOXICITY | IRRITATION |
|---|---|
| Oral (rat) LD50: 8000 mg/kg | Skin (human): 15 mg/3d (int)- Mild |
| Oral (rat) LD50: 4920 ul/kg | Skin (rabbit): 560 mg/24 hr- Mild |
| Dermal (rat) LD50: >16000 mg/kg minor iritis, | |
| Dermal (rabbit) LD50: 16 ml/kg * minor conjunctival irritation | |
| Intraperitoneal (rat) LD50: 1510 mg/kg with significant discharge; | |
| Oral (mouse) LD50: 5846 mg/kg no corneal injury * | |
| Intraperitoneal (mouse) LD50: 1450 mg/kg | Skin (rabbit): 4 h occluded |
| Oral (rabbit) LD50: 2200 mg/kg no irritation * | |
| Dermal (rabbit) LD50: >20000 mg/kg | Eye (rabbit): 5.62 mg - SEVERE |
| Oral (g.pig) LD50: 2200 mg/kg | Eye (rabbit): 10 mg - Mild |
| Oral (rat) LD50: 5560 mg/kg (calc.) | Eye (rabbit): 0.1 ml - |
| Oral (rat) LD50: 4.92 ml/kg (female) * | |
| Oral (rat) LD50: 8.57 ml/kg (male) * | |
| Oral (Guinea pig) LD50: 2200 mg/kg | |

■ Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to

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the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
For triethanolamine (and its salts):
Acute toxicity: Triethanolamine is of low toxicity by the oral, dermal and inhalation routes of exposure.
Oral LD50 values have been shown to range from approximately 5-10 g/kg. The dermal LD50 is greater than 2 g/kg . The inhalation LC50 is greater than a saturated atmosphere
Repeat Dose Toxicity: The studies to determine toxicity of triethanolamine from repeated exposure were conducted for a duration of 91 days or 2 years. In both studies the NOAEL was at least 1000 mg/kg. There was no evidence of gross or histopathological change that could be attributed to treatment. Also, triethanolamine was shown to be non-carcinogenic.
Genetic Toxicity: Mutation (bacterial);This endpoint has been satisfied by two studies using 4 strains (TA 98, TA 100, TA 1535 and TA 1537) of Salmonella typhimurium. Triethanolamine was not mutagenic in any of the tester strains.
Chromosomal aberration (mammalian, in vitro) – This endpoint was satisfied by a cytogenetic assay using Chinese hamster lung cells. Triethanolamine did not induce chromosome aberrations in this test system.
Reproductive Toxicity: No studies have been conducted to specifically evaluate the effect of triethanolamine on reproductive performance. However, based on consideration of the repeat dose toxicity studies of at least 90 days duration, there were no abnormalities noted in the histopathological examination of reproductive organs. This fact, and the lack of effects on foetal development, allow the conclusion that triethanolamine would not be expected to produce adverse effects to reproductive performance and fertility.
Developmental Toxicity: This endpoint was satisfied using a developmental toxicity screening study according to the Chernoff-Kavlock method . Based on the results from this test, triethanolamine does not impair development of the fetus.
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.
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.
Dermal rabbit value quoted above is for occluded patch in male or female animals
* Union Carbide

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

| TOXICITY | IRRITATION |
|---|---|
| | Eyes (rabbit): 1.9 mg |
| | Eyes (rabbit):100 mg/24h- Moderate |
| | *[BASF] |

■ Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.

**continued...**

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
For ethylenediaminetetraacetic acid (EDTA) and its salts:
EDTA is a strong organic acid (approximately 1000 times stronger than acetic acid). It has a high affinity for alkaline-earth ions (for example, calcium and magnesium) and heavy-metal ions (for example, lead and mercury). This affinity generally results in the formation of highly stable and soluble hexadentate chelate complexes. EDTA's ability to complex is used commercially to either promote or inhibit chemical reactions, depending on application
EDTA and its salts are expected to be absorbed the lungs and gastrointestinal tract; absorption through the skin is unlikely.
In general, EDTA and its salts are mild skin irritants but considered severe eye irritants. The greatest risk in the human body will occur when the EDTA attempts to scavenge the trace metals used and required by the body The binding of divalent and trivalent cations by EDTA can cause mineral deficiencies, which seem to be responsible for all of the known pharmacological effects. Sensitivity to the toxic effects of EDTA is, at least in part, related to the deficiency of zinc.
Several short term studies, reported no adverse effects from administering doses up to 5% of EDTA and its salts to lab rodents daily and for several weeks. Only diarrhoea and lowered food consumption were reported in animals given 5% disodium EDTA. However, abnormal effects were seen in animals that were fed mineral deficient diets. Abnormal symptoms were observed in male and female rats fed a low mineral diet (0.54% Ca and 0.013%Fe) with the addition of 0%, 0.5%, or 1% disodium EDTA for 205 days. Rats fed a low percent of disodium EDTA in the diet for short term studies with adequate minerals showed no signs of toxicity. Rats fed 0.5% disodium EDTA for 44-52 weeks were without deleterious effects on weight gain, appetite, activity and appearance. Rats fed 1% disodium EDTA with adequate mineral diet for 220 days showed no evidence of dental erosion.
EDTA and its salts are eliminated from the body, 95% via the kidneys and 5% by the bile, along with the metals and free ionic calcium which was bound in transit through the circulatory system
Trisodium EDTA was tested in a bioassay for carcinogenicity by the National Cancer Institute. Trisodium EDTA administered to male and female rats at low (3,750 ppm) or high (7,500 ppm) concentrations for 103 weeks produced no compound-related signs of chemical toxicity, and tumor incidence was not related to treatment .
EDTA and its salts should not pose a teratogenic concern based on previous studies in lab rodents. Study results indicate no teratogenic effects are likely in lab rodents at doses up to 1000 mg/kg . Adequate minerals in the diet and administration of tap water prevented possible teratogenic effects of EDTA during pregnancy. Teratogenic effects observed in lab rodents were likely due to animals maintained on deionised water and a semi-purified diet, and housed in nonmetallic caging. Infants and children will unlikely be exposed to high concentrations as in lab rodents.
Rats given 1250 mg/kg or 1500 mg/kg by gavage exhibited more maternal toxicity than the diet group, but produced only 21% malformations in the offspring at the lower dose. The subcutaneously administration of 375 mg/kg was also maternally toxic, but did not result in malformations in the offspring. Differences in toxicity and teratogenicity are probably related to absorption differences and interaction with metals .
Disodium EDTA ingested during pregnancy is teratogenic in rats at 2% in the diet and greater.
The maximum human consumption of EDTA and its salts in foods was reported to be on the order of 0.4 mg/kg/day . Infants and children also generally drink tap water instead of deionised or distilled water. Even if young infants were to be fed some solid food, given the characteristics of EDTA and its salts, residues are not likely to be present at concentrations for potential sensitivity.
Oral (rat) LD50: 2000-3200 mg/kg* Skin (rabbit):500 mg/24h-moderate

**continued...**

WATER:
■ No significant acute toxicological data identified in literature search.

**CARCINOGEN**

| | | | |
|---|---|---|---|
| Triethanolamine | International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs | Group | 3 |

## Section 12 - ECOLOGICAL INFORMATION

triethanolamine 48 hr EC50 (100) mg/L Common shrimp, sand shrimp Crustacea Source: Experimental

Refer to data for ingredients, which follows:

TRIETHANOLAMINE:
EDTA TETRASODIUM SALT:
GENERAL HARDNESS (GH) TEST SOLUTION:
■ DO NOT discharge into sewer or waterways.

GENERAL HARDNESS (GH) TEST SOLUTION:

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 |

■ for triethanolamine:
Koc : 3
Half-life (hr) air : 4
Henry's atm m3 /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.
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 betweeen 0 and 50).

**continued...**

Henry's Law Constant (H) is estimated to be 3.38E-19 atm.m3/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.
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).
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).
Environmental fate:
Transport: Due to the high water solubility and low vapour pressure of triethanolamine, it is likely to partition preferentially into the water phase from which volatilisation to the atmosphere is likely to be only a minor removal process. The low log Kow value indicates that bioaccumulation and adsorption onto soils/sediments is unlikely to occur.
Water: If released to water, triethanolamine should biodegrade. The half-life of this compound is expected to range from a few days to a few weeks depending on the degree of acclimation of the system. Bioconcentration in aquatic organisms, adsorption to suspended solids and sediments, and volatilization are not expected to be important fate processes in water. Triethanolamine does not decompose or hydrolyze in contact with water and there is no abiotic degradation
Biodegradation: Triethanolamine is readily biodegradable, possibly after a short acclimation period . The data indicate that triethanolamine is inherently biodegradable. Extensive removal due to biodegradation is to be expected in sewage treatment plants . In the ready biodegradation tests, triethanolamine was readily biodegradable in the AFNOR (97% degradation based on DOC removal), STURM (91% degradation based on CO2 evolution) and OECD Screening test (96% degradation based on DOC removal, but little degradation was observed in the MITI (14 day test; 2% removal based on BOD and Closed Bottle (0-9% removal based on BOD).
Ecotoxicity:
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 (Carassius 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
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.

EDTA TETRASODIUM SALT:
■ Harmful to aquatic organisms.
■ May cause long-term adverse effects in the aquatic environment.
■ Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters. Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
■ For ethylenediaminetetraacetic acid (EDTA) (and its salts)
Environmental fate:
Based on its physicochemical properties and collateral experimental results, EDTA is not expected to volatilize from soil or water. When released to the atmosphere, EDTA should sorb to particulate matter, and appears to have the potential to photolyse .In water, EDTA may react with photochemically generated hydroxyl radicals (half-life of approximately 230 days or 8 months).
When released to soil, EDTA is mobile and expected to complex trace metals and alkaline earth metals, thereby

**continued...**

causing an increase in the total solubility of the metals. EDTA may eventually predominate as the Fe(III) chelate in acidic soils and as the Ca chelate in alkaline soils. EDTA and its chelates are expected to leach readily through soil. When released to water, EDTA is also expected to form soluble complexes with trace metals and alkaline earth metals. It would not be expected to sorb appreciably to sediments or suspended solids in water, and is known not to be retained or altered chemically in typical water treatment facilities . However depending upon speciation and local conditions, some sorption (approximately 6 to 25%) occurred within a contact time of one month in a sediment removed from a lake in Finland
When released to soil or water EDTA is slow to degrade, with aerobic biodegradation (mineralisation) being the dominant mechanism. Possible biodegradation products include ethylenediamine triacetic acid, iminodiacetic acid, N,N-ethylenediamine diacetic acid, ethylenediamine monoacetic acid, nitrilotriacetic acid and glycine
Recalcitrance to degradation is associated with the high thermodynamic stability of metal complexes and is problematic for treatment facilities. In a variety of representative soils, common values for the degree of aerobic metabolism of EDTA at a temperature of 30 C and soil concentrations of 2-4 ppm are 13-45% after 15 weeks and 65-70% after 45 weeks
Biodegradation in subsoil or under anaerobic conditions is essentially negligible.
Abiotic degradation in the environment, except for photolysis, is also negligible. Results in sediments were similar to those for soil.
Although EDTA is slow to degrade under typical environmental conditions, based on experimental results with bluegill sunfish and its intrinsic physicochemical properties (ionic nature and water solubility), EDTA is not expected to bioconcentrate
Ecotoxicity:
For EDTA and various salts
Fish LC50 (96 h): 20-430 mg/l
Daphnia LC50 (48 h): 14-100 mg/l
Green algae EC50 (96 h): 3-60 mg/l
EDTA compounds range from practically non-toxic to moderately toxic on an acute basis depending on the salt. Algae and invertebrates are among the most sensitive species based on predictive modeling for acute and chronic endpoints for EDTA, depending on the compound. EDTA and its salts also do not appear to be very toxic for terrestrial wild mammals and adverse effects from reasonably expected agricultural uses are not expected.
■ Polyanionic monomers, for example, ethylenediaminetetraacetic acid (EDTA) are of concern only for their toxicity to green algae. Toxicity to algae is moderate and it appears that the mode of toxic action of these polyanionic monomers is overchelation of nutrient elements needed by algae for growth. Polyanionic monomers are assessed similarly to the polycarboxylic acid polymers.
Not readily biodegradable.
Harmful to aquatic organisms.
May cause long term adverse effects in the aquatic environment. [ORICA]
Fish LC50 (96 h): Leuciscus idus >500 mg/l
Daphnia EC50 (48h): >100 mg/l
Algae EC50 (72h): 10-100 mg/l
COD Value: 570 mg O2/g
BOD5-Value: 20 mg O2/g
Toxicity to bacteria: 50 mg/l Warburg test

**Ecotoxicity**

| Ingredient | Persistence: Water/Soil | Persistence: Air | Bioaccumulation | Mobility |
|---|---|---|---|---|
| triethanolamine | LOW | | LOW | HIGH |
| water | LOW | | LOW | HIGH |

## Section 13 - DISPOSAL CONSIDERATIONS

- Recycle where possible
  Otherwise ensure that:
- licenced contractors dispose of the product and its container.
- disposal occurs at a licenced facility.

## Section 14 - TRANSPORTATION INFORMATION

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

## Section 15 - REGULATORY INFORMATION

### REGULATIONS

Regulations for ingredients

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

"Canada - Alberta Occupational Exposure Limits","Canada - British Columbia Occupational Exposure Limits","Canada - Nova Scotia Occupational Exposure Limits", "Canada - Ontario Occupational Exposure Limits","Canada - Prince Edward Island Occupational Exposure Limits","Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)","Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits","Canada Chemical Weapons Schedule 3 (English)","Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (French)", "Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction (English)","GESAMP/EHS Composite List - GESAMP Hazard Profiles","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","International Agency for Research on Cancer (IARC) - Agents Reviewed by the IARC Monographs","OECD Representative List of High Production Volume (HPV) Chemicals","The Australia Group Export Control List: Chemical Weapons Precursors","US - California Permissible Exposure Limits for Chemical Contaminants","US - Minnesota Hazardous Substance List","US - Pennsylvania - Hazardous Substance List","US - Rhode Island Hazardous Substance List", "US ACGIH Threshold Limit Values (TLV)","US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe, with qualifications","US Department of Homeland Security Chemical Facility Anti-Terrorism Standards - Chemicals of Interest","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA High Production Volume Program Chemical List","US EPA Master Testing List - Index I Chemicals Listed","US FDA Indirect Food Additives: Adhesives and Components of Coatings - Substances for Use Only as Components of Adhesives - Adhesives","US Food Additive Database","US Toxic Substances Control Act (TSCA) - Inventory","US TSCA Section 8 (d) - Health and Safety Data Reporting","USA: Chemical Facility Anti-Terrorism Standards - List Appendix A - 6CFR 27"

### EDTA tetrasodium salt (CAS: 64-02-8,10378-23-1,13235-36-4) is found on the following regulatory lists;

"Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (French)","IMO IBC Code Chapter 17: Summary of minimum requirements","IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk","OECD Representative List of High Production Volume (HPV) Chemicals","US Cosmetic Ingredient Review (CIR) Cosmetic ingredients found safe as used","US DOE Temporary Emergency Exposure Limits (TEELs)","US EPA High Production Volume Program Chemical List","US EPA Master Testing List - Index I Chemicals Listed","US Food Additive Database","US Toxic Substances Control Act (TSCA) - Inventory"

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

"Canada Domestic Substances List (DSL)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","Canada Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (French)","IMO IBC Code Chapter 18: List of products to which the Code does not apply","OECD Representative List of High Production Volume (HPV) Chemicals","US - Pennsylvania - Hazardous Substance List","US DOE Temporary Emergency Exposure Limits (TEELs)","US NFPA 30B Manufacture and Storage of Aerosol Products - Chemical Heat of Combustion","US Toxic Substances Control Act (TSCA) - Inventory","US TSCA Section 8 (a) Inventory Update Rule (IUR) - Partial Exemptions"

### No data for General Hardness (GH) Test Solution (CW: 4650-37)

## Section 16 - OTHER INFORMATION

### Denmark Advisory list for selfclassification of dangerous substances

| Substance | CAS | Suggested codes |
|---|---|---|
| triethanolamine | 102- 71- 6 | |

**continued...**

**INGREDIENTS WITH MULTIPLE CAS NUMBERS**

| Ingredient Name | CAS |
|---|---|
| EDTA tetrasodium salt | 64- 02- 8, 10378- 23- 1, 13235- 36- 4 |

**EXPOSURE STANDARD FOR MIXTURES**

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

■ Composite Exposure Standard for Mixture (TWA) :100 mg/m³.

**CONTACT**

Mars Fishcare

■ 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.

■ For detailed advice on Personal Protective Equipment, refer to the following U.S. Regulations and Standards:
OSHA Standards - 29 CFR:
1910.132 - Personal Protective Equipment - General requirements
1910.133 - Eye and face protection
1910.134 - Respiratory Protection
1910.136 - Occupational foot protection
1910.138 - Hand Protection
Eye and face protection - ANSI Z87.1
Foot protection - ANSI Z41
Respirators must be NIOSH approved.




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# CARBONATE HARDNESS (KH) TEST SOLUTION



## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME**
CARBONATE HARDNESS (KH) TEST SOLUTION

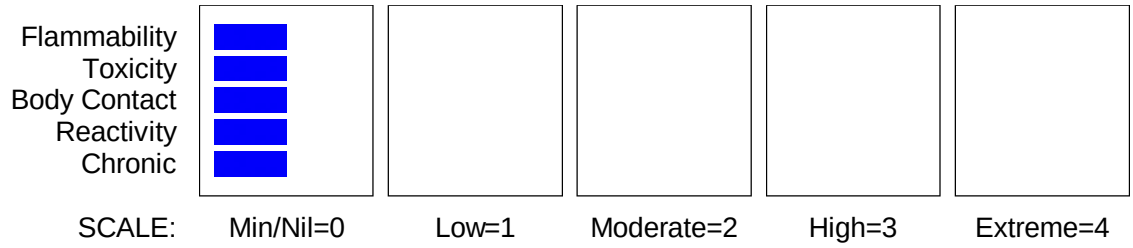
**OTHER NAMES**
"Solution ID# 3339"

**PRODUCT USE**
Test solution for products 34P, 58 and 59.

**SUPPLIER**
Company: Mars Fishcare Inc
Address:
50 East Hamilton Street
Chalfont
PA, 18914
USA
Telephone: +1 215 822 8181
Fax: +1 215 822 1906

## Section 2 - HAZARDS IDENTIFICATION

**CHEMWATCH HAZARD RATINGS**




**EMERGENCY OVERVIEW**

**HAZARD**
Not hazardous

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| NAME | CAS RN | % |
|---|---|---|
| non hazardous ingredients | | 100 |

**continued...**

## 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 Centre 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.

## Section 5 - FIRE FIGHTING MEASURES

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

**FIRE/EXPLOSION HAZARD**
• 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.

**PERSONAL PROTECTION**
Glasses:
Chemical goggles.

Gloves:
When handling larger quantities:

## Section 6 - ACCIDENTAL RELEASE MEASURES

**MINOR SPILLS**
• Clean up all spills immediately.
• Avoid breathing vapours and contact with skin and eyes.

**continued...**

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

**Personal Protective Equipment advice is contained in Section 8 of the MSDS.**

## 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.

**SUITABLE CONTAINER**
- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled 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 alkalies, oxidising agents and chemicals readily decomposed by acids, i.e. cyanides, sulfides, carbonates.

**SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS**

| | | | | | |
|---|---|---|---|---|---|
| + | + | + | + | X | + |

*+: May be stored together*
*O: May be stored together with specific preventions*
*X: Must not be stored together*

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

**EXPOSURE CONTROLS**

**continued...**

**MATERIAL DATA**
CARBONATE HARDNESS (KH) TEST SOLUTION:
Not available

**PERSONAL PROTECTION**


**EYE**
- Safety glasses with side shields; or as required,
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

**HANDS/FEET**
■ Wear general protective gloves, eg. 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. For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

**ENGINEERING CONTROLS**
■ General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.

| Type of Contaminant: | Air Speed: |
|---|---|
| solvent, vapours, degreasing etc., evaporating from tank (in still air) | 0.25- 0.5 m/s (50- 100 f/min) |

**continued...**

| | |
|---|---|
| aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation) | 0.5- 1 m/s (100- 200 f/min.) |
| direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion) | 1- 2.5 m/s (200- 500 f/min) |
| grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion). | 2.5- 10 m/s (500- 2000 f/min.) |

Within each range the appropriate value depends on:

| Lower end of the range | Upper end of the range |
|---|---|
| 1: Room air currents minimal or favourable to capture | 1: Disturbing room air currents |
| 2: Contaminants of low toxicity or of nuisance value only | 2: Contaminants of high toxicity |
| 3: Intermittent, low production. | 3: High production, heavy use |
| 4: Large hood or large air mass in motion | 4: Small hood - local control only |

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

**APPEARANCE**
Reddish orange solution with no odour; mixes with water.

**PHYSICAL PROPERTIES**
Liquid.
Mixes with water.

| | | | |
|---|---|---|---|
| State | Liquid | Molecular Weight | Not Applicable |
| Melting Range (°F) | Not Available | Viscosity | Not Available |
| Boiling Range (°F) | Not Available | Solubility in water (g/L) | Miscible |
| Flash Point (°F) | Not Applicable | pH (1% solution) | Not Available |
| Decomposition Temp (°F) | Not Available | pH (as supplied) | 1.20- 1.45 |
| Autoignition Temp (°F) | Not Applicable | Vapour Pressure (mmHG) | Not Available |
| Upper Explosive Limit (%) | Not Applicable | Specific Gravity (water=1) | 0.997 approx. |

**continued...**

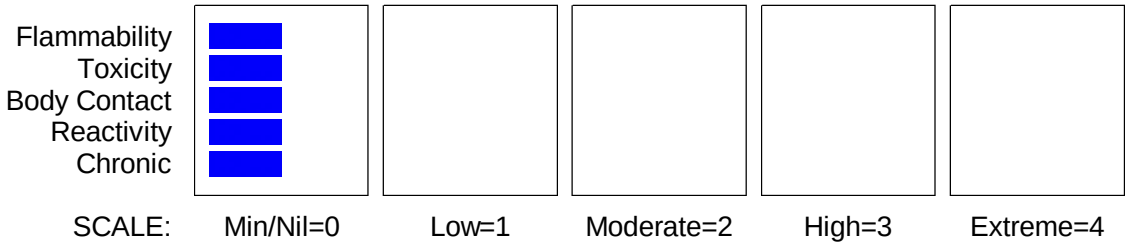
| | | | |
|---|---|---|---|
| Lower Explosive Limit (%) | Not Applicable | Relative Vapour Density (air=1) | Not Available |
| Volatile Component (%vol) | Not Available | Evaporation Rate | Not Available |

## Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

**CONDITIONS CONTRIBUTING TO INSTABILITY**
• Presence of incompatible materials.
• Product is considered stable.
• Hazardous polymerisation will not occur.
*For incompatible materials - refer to Section 7 - Handling and Storage.*

## Section 11 - TOXICOLOGICAL INFORMATION

**CHEMWATCH HAZARD RATINGS**




**POTENTIAL HEALTH EFFECTS**

**ACUTE HEALTH EFFECTS**

**SWALLOWED**
■ The material has NOT been classified by EC Directives or other classification systems 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 (eg. liver, kidney) damage is evident. Present definitions of harmful or toxic substances are generally based on doses producing mortality rather than those producing morbidity (disease, ill-health). Gastrointestinal tract discomfort may produce nausea and vomiting. In an occupational setting however, ingestion of insignificant quantities is not thought to be cause for concern.

**EYE**
■ Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised 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 by EC Directives 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 by EC Directives 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.

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**CHRONIC HEALTH EFFECTS**
■ Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

**TOXICITY AND IRRITATION**
■ Not available. Refer to individual constituents.

## Section 12 - ECOLOGICAL INFORMATION

No data

## Section 13 - DISPOSAL CONSIDERATIONS

• Recycle where possible
Otherwise ensure that:
• licenced contractors dispose of the product and its container.
• disposal occurs at a licenced facility.

## Section 14 - TRANSPORTATION INFORMATION

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

## Section 15 - REGULATORY INFORMATION

**REGULATIONS**

**No data for Carbonate Hardness (KH) Test Solution (CW: 4650-3)**

## Section 16 - OTHER INFORMATION

**CONTACT**
Mars Fishcare
■ 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

**continued...**

by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

■ For detailed advice on Personal Protective Equipment, refer to the following U.S. Regulations and Standards:
OSHA Standards - 29 CFR:
1910.132 - Personal Protective Equipment - General requirements
1910.133 - Eye and face protection
1910.134 - Respiratory Protection
1910.136 - Occupational foot protection
1910.138 - Hand Protection
Eye and face protection - ANSI Z87.1
Foot protection - ANSI Z41
Respirators must be NIOSH approved.



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