1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name	**Dissolvine® E-39**
Chemical Name	Ethylenediaminetetraacetic acid, tetrasodium salt in water
Synonym(s)	Tetrasodium EDTA
Product Use	Chelating agent
Manufacturer / Supplier	Akzo Nobel Functional Chemicals LLC Chelates Americas 525 West Van Buren St., Chicago, IL 60607 Tel. 1-800-906-7979 www.dissolvine.com

Emergency Telephone Numbers

CHEMICAL EMERGENCY ***(Spill, Leak, Fire, Exposure or Accident)***	CHEMTREC (24-hr)	(800) 424-9300 (Toll-free in the U.S., Canada, and the U.S. Virgin Islands) (703) 527-3887 (For calls originating elsewhere / collect calls are accepted)
	CANUTEC (Canada)	(613) 996-6666
MEDICAL / HANDLING EMERGENCIES	(914) 693-6946 [AkzoNobel – USA]	

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

This material is considered hazardous by the OSHA Hazard Communication Standard [29 CFR 1910.1200]

WARNING !

- **Corrosive to aluminum.**
- **Causes eye irritation.**
- **May cause skin and respiratory tract irritation.**
- **Contains material which may cause kidney damage and cancer, based on animal data.**

Appearance and odor Clear yellow liquid with a slight ammonia odor.

POTENTIAL HEALTH EFFECTS *[See Section 11 for additional information]*

Primary Route(s) of Exposure	Eye contact, skin contact and inhalation
Acute Exposure	
Inhalation	Exposure to an excessive concentration of vapors, mist, fumes or aerosols may cause respiratory tract discomfort and/or mild irritation.
Skin Contact	May cause skin irritation.
Eye Contact	Eye contact causes moderate irritation.
Ingestion	This product is expected to have a low order of acute toxicity.
Carcinogenicity	This product and its components are not listed as known carcinogens or potential carcinogens by **IARC** (International Agency for Research on Cancer), **ACGIH** (American Conference of Governmental Industrial Hygienists), **NTP** (National Toxicology Program), **OSHA** (U.S. Occupational Safety & Health Administration) and **EPA** (U.S. Environmental protection Agency). However, Nitrilotriacetic acid (NTA) and its salts were determined to be "possibly carcinogenic to humans" (Group 2B) by IARC, a compound which "may reasonably be anticipated to be a carcinogen" by NTP and a "select carcinogen" by OSHA.

2. HAZARDS IDENTIFICATION (CONTINUED)

Chronic Effect / Developmental Toxicity EDTA and its sodium salts caused birth defects in some animal studies in the presence of maternal toxicity.

Medical Conditions Aggravated by Exposure Zinc deficiency may be aggravated by systemic exposure to EDTA and its sodium salts.

POTENTIAL ENVIRONMENTAL EFFECTS *[See Section 12 for additional information]*

Aquatic Toxicity This product is not expected to be harmful to aquatic life, based on available data with related materials.

3. COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENTS	CAS Number	% (w/w)
Tetrasodium EDTA	64-02-8	37 – 41
Sodium hydroxide	1310-73-2	0.5 – 1.9
Trisodium NTA	5064-31-3	0.5 – 2
Ethylenediaminetriacetic acid, trisodium salt (ED3ANa3)	19019-43-3	< 0.8
Water	7732-18-5	53 – 59

4. FIRST AID MEASURES

Inhalation Remove victim to fresh air. If irritation occurs or if breathing becomes difficult, get medical attention.

Skin Contact Remove contaminated clothing, shoes and equipment. Wash all affected areas with soap and plenty of water. Wash contaminated clothing and shoes before reuse. Get medical attention if irritation occurs or persists.

Eye Contact Flush eyes with large quantities of running water for a minimum of 15 minutes. If the victim is wearing contact lenses, remove them. Hold the eyelids apart during the flushing to ensure rinsing of the entire surface of the eye and lids with water. Do not let victim rub eye(s). Do not attempt to neutralize with chemical agents. Get medical attention.

Ingestion ONLY induce vomiting at the instructions of a physician. If victim is conscious, rinse mouth and give water to drink. Never give anything by mouth to an unconscious person. Get medical attention if health effects occur.

Note to Physician Attending physician should treat exposed patients symptomatically.

5. FIRE FIGHTING MEASURES

Flammable Properties Not flammable or combustible

Extinguishing Media Use water fog or spray, dry chemical, foam or carbon dioxide extinguishing agents.

Fire Fighting Procedures As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate all non-essential personnel from the fire area. Fire fighters should wear full-face, self-contained breathing apparatus and impervious protective clothing.

Fire & Explosion Hazards This product is not defined as flammable or combustible and should not be a fire hazard. Under fire conditions, it does not contribute any unusual hazards.

Hazardous Combustion Products Thermal decomposition products may release toxic and/or hazardous fumes and gases, including nitrogen oxides, carbon oxides and metal oxide fumes.

NFPA Hazard Rating **Health:** 2 / **Fire:** 1 / **Instability:** 0 / **Other:** None
[0 – Minimal / 1 – Slight / 2 - Moderate / 3 – High / 4 – Extreme]

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions All personnel involved in spill cleanup should avoid skin and eye contact by wearing appropriate personal protective equipment.

Methods for Containment Safely stop source of spill. Dike area to prevent spill from spreading. Restrict non-essential personnel from area.

Environmental Precautions Collect as much as possible in a clean container for reuse (if not contaminated) or disposal (if contaminated).

Methods for Clean-up Soak up liquid residue with a suitable absorbent such as clay, sawdust or kitty litter. Sweep up absorbed material and place in a chemical waste container for disposal. Then flush area with water. CAUTION – The spill area may be slippery.

Other Information See also Section 13 for disposal information.

7. HANDLING AND STORAGE

Handling Avoid inhalation of vapors or fumes as well as prolonged and/or repeated skin and eye contact.

Storage Keep containers closed and dry. This material is suitable for any general chemical storage area. Isolate from incompatible materials such as strong oxidizing agents. Store in PVC, PE, stainless steel or bituminized tanks. Avoid contact with aluminum, copper, copper alloys, nickel and zinc.

Recommended Storage Temperature Store in sealed or original containers in a cool and dry place at ambient temperatures (below 77°F / 25°C).

General Comments Containers should not be opened until ready for use. It is recommended that products be retested if stored for more than 3 years. Under ideal storage conditions, the shelf-life is almost indefinite.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Guidelines

Chemical Name	OSHA – PELs (mg / m^3)		ACGIH – TLVs (mg / m^3)		NIOSH – RELs (mg / m^3)		AIHA – WEELs (mg / m^3)	
	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)
Tetrasodium EDTA	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Sodium hydroxide	**2.0**	N/D	N/D	**2.0 (C)**	**N/D**	**2.0 (C)**	N/D	N/D
Trisodium NTA	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Trisodium ED3A	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Water	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D

[Ref: ACGIH Guide to Occupational Exposure Values, 2009 Edition]

Legend:

CEIL:	Ceiling Exposure Limit	PEL:	Permissible Exposure Limit	REL:	Recommended Exposure Limit
STEL:	Short Term Exposure Limit	TLV:	Threshold Limit Value	TWA:	Time-Weighted Average
N/D:	Not Determined	WEEL:	Workplace Environmental Exposure Level		

ACGIH: American Conference of Governmental Industrial Hygienists
AIHA: American Industrial Hygiene Association
NIOSH: National Institute for Occupational Safety and Health
OSHA: Occupational Safety and Health Administration

***Immediately Dangerous to Life or Health Concentrations* (IDLH / NIOSH):** Sodium hydroxide = 10 mg/m^3

8. EXPOSURE CONTROLS / PERSONAL PROTECTION (CONTINUED)

Engineering Controls & Ventilation Special ventilation is usually not required under normal use conditions. Ensure that existing ventilation is sufficient to prevent the circulation and/or accumulation of vapors in the air.

Personal Protective Equipment (PPE)

Respiratory Use of respiratory protection is generally not required. However, if use conditions generate vapors, aerosols or fumes and adequate ventilation (e.g., outdoor or well-ventilated area) is not available, use a NIOSH-approved organic vapor respirator with HEPA (High Efficiency Particulate Air) filters to reduce potential for inhalation exposure. Where exposure potential necessitates a higher level of protection, use a NIOSH-approved, positive-pressure/pressure-demand, air-supplied respirator. When using respirator cartridges or canisters, they must be changed frequently (following each use or at the end of the work shift) to assure breakthrough exposure does not occur.

Skin Skin contact with the product should be minimized or prevented through the use of suitable protective clothing, gloves and footwear selected according to use condition exposure potential. For permanent (>8 hours) full contact use, 100% Viton gloves are recommended.

Eyes/Face Since eye contact may cause irritation, chemical goggles and/or a face shield should be worn when handling this product.

Hygiene Measures All food and smoking materials should be kept in a separate area away from the storage/use location. Eating, drinking and smoking should be prohibited in areas where there is a potential for significant exposure to this material. Before eating, drinking and smoking, hands and face should be thoroughly washed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form	clear liquid
Color	yellow
Odor	slight ammonia odor
Boiling Point	224.6°F (107°C)
Bulk Density	not applicable
Evaporation Rate *(Butyl Acetate=1)*	not determined
Melting Point	< 0°F (-18°C) / freezing point
Odor Threshold	not determined
pH	~ 11.5 (1% solution) ; 13.5 (as is)
Partition Coefficient *(n-octanol/water)*	Log P_{ow} < 0
Solubility in Water	miscible
Solubility in Other Solvents	not determined
Specific Gravity	1.25 – 1.33
Vapor Density *(Air = 1)*	same as water
Vapor Pressure	same as water
Viscosity	20 mPa.s (@ 20°C)
Volatiles *(% by weight)*	not determined
Other	decomposition temperature : > 392°F / > 200°C (solid) ; >224.6°F / >107°C (water loss)
Flammability	not flammable or combustible
Flash Point (Method)	not applicable
Upper Flammable Limit *(% by volume)*	not applicable
Lower Flammable Limit *(% by volume)*	not applicable

9. PHYSICAL AND CHEMICAL PROPERTIES (CONTINUED)

Auto-Ignition Temperature	not applicable

< : less than > : greater than ≈ : approximately

10. STABILITY AND REACTIVITY

Chemical Stability	This product is stable under recommended storage and handling conditions (see section 7). It is not self-reactive and is not sensitive to physical impact.
Incompatible Materials	This product is incompatible with strong oxidizers.
Conditions to Avoid	Avoid contact with aluminum, nickel, zinc, copper and copper alloys. Aqueous solution in contact with aluminum evolves hydrogen. Do not expose product to elevated temperatures for extended periods of time.
Hazardous Decomposition Products	Under fire conditions the product may support combustion and decomposes to give off carbon oxides fumes (CO, CO_2), nitrogen oxides and water vapor.
Possibility of Hazardous Reactions	Hazardous polymerization is not expected to occur under normal temperatures and pressures.

11. TOXICOLOGICAL INFORMATION

Inhalation - Acute	The acute LC_{50} for this product is not available. There were no clinical signs of toxicity when rats were exposed for 8 hours to an atmosphere enriched with Tetrasodium EDTA. The LC_{50} for Trisodium NTA component is greater than 5 mg/L (rats / 4-hr test).
Inhalation - Chronic	No known effects for the mixture.
Skin - Acute	Dermal toxicity for this product is not available. Skin irritation has not been determined for this product. Solutions containing either 40 or 80% Na4 EDTA were reported to be not irritating to rabbit skin after a 4-hour exposure. NaOH may be corrosive or irritating to skin depending on the concentration.
Skin - Chronic	Repeated or prolonged contact may cause irritation.
Eyes	Eye irritation has not been determined for this product. A 40% solution of Na4 EDTA was reported to be moderately irritating to rabbit eyes. Corneal opacity, iritis and moderate to severe conjunctivitis were reported. NaOH may be corrosive or irritating to eyes depending on the concentration.
Ingestion - Acute	The oral LD_{50} is greater than 2,000 mg/kg (rat) for a 40% solution of Tetrasodium EDTA.
Ingestion - Chronic	No other known effects for the mixture. Chronic ingestion of NTA and its trisodium salt has been shown to cause kidney toxicity.
Sensitization	Not determined.
Carcinogenicity	This product does not contain any carcinogens or potential carcinogens as listed by IARC, NTP, ACGIH or OSHA. However, Nitrilotriacetic acid (NTA) and its salts were determined to be “possibly carcinogenic to humans” (Group 2B) by IARC, a compound which “may reasonably be anticipated to be a carcinogen” by NTP and a “select carcinogen” by OSHA.
Mutagenicity	Tetrasodium EDTA component is not mutagenic in a series of tests, including the Ames Assay, the Chromosomal Aberration and the Mouse Lymphoma. NTA and its sodium salts were not genotoxic in experimental systems in vivo. Neither the acid nor its salts were genotoxic in mammalian cells in vitro and they were not mutagenic to bacteria. However, trisodium NTA has been shown to be positive in the BALB/c3T3 transformation assay when tested up to 7.8 mM.
Cytotoxicity	Tetrasodium EDTA did not damage normal rat kidney cells at doses of 0.1 to 20 µM. Long-term exposure to 0.1 or 5.0 µM was not toxic and did not inhibit DNA synthesis.

11. TOXICOLOGICAL INFORMATION (CONTINUED)

Reproductive Toxicity / Teratogenicity / Embryotoxicity

No data available for the mixture.
EDTA and its sodium salts have been reported, in some studies, to cause birth defects in laboratory animals only at exaggerated doses that were toxic to the mother. These effects are likely associated with zinc deficiency due to chelation. Exposures having no effect on the mother should have no effect on the fetus.
Tetrasodium EDTA component is not teratogenic under conditions of the test [Pregnant female rats were administered 1374 mg Na_4EDTA /kg/day on gestation days 7 to 14 in half the dose, twice daily. Clinical signs of maternal toxicity included diarrhea, reduced weight gain and depressed activity.]

Trisodium NTA is not teratogenic and did not induce reproductive toxicity.

Other Effects

Tetrasodium EDTA, administered to mice in drinking water at a dose of 25 mM, caused a reduction of calcium in bone, liver and muscle. Zinc was reduced in kidneys, muscle and liver. Magnesium was reduced in bones and liver but was increased in the kidneys.

Target Organs

Eyes and reproductive system (in presence of maternal toxicity).

12. ECOLOGICAL INFORMATION

Ecotoxicity

No data available on the mixture. The following data is available on the component Tetrasodium EDTA:

Test	Exposure / Duration	Test Results
Daphnia Magna	24-h	EC_{50} = 610 mg/L
Fish *(bluegill sunfish)*	96-h (static)	· LC_{50} = 157 mg/L, 1030 mg/L and 2070 mg/L for product containing 39% tetrasodium EDTA in very soft water, medium hard water and very hard water respectively. · LC_{50} = 486 mg/L for solid Tetrasodium EDTA tested in very hard water
Bacteria (*Protozoa Chilomonas paramaecium*) – Growth inhibition	Unknown	EC_{50} = 663 mg/L

Biodegradation

Following data relates to Tetrasodium EDTA component:
- Tetrasodium EDTA (39% in water) was not biodegraded over 28 days in the Sturm CO2 evolution test.
- Tetrasodium EDTA was not biodegradable in the Closed Bottle Test conducted with natural seawater.

Bioaccumulation

Log P_{ow} = - 13.17 (calculated by EPIWIN/KOWWIN model)

Other Ecotoxicity information

Tetrasodium EDTA component:

- **Algae** (Cell multiplication inhibition test) : toxicity threshold of Tetrasodium EDTA to the green algae and the blue-green algae was 11 mg/L and 76 mg/L respectively.
- **Chemical Fate:** Tetrasodium EDTA is not expected to undergo hydrolysis. The substance is not expected to enter the atmosphere significantly due to its high water solubility.

13. DISPOSAL CONSIDERATIONS

Waste Disposal

The characteristic of corrosivity per RCRA would be exhibited by unused product if it becomes a waste material. It is the responsibility of the waste generator to evaluate whether his wastes are hazardous by characteristic or listing. Dispose in accordance with all local, state and federal regulations.
NOTE – State and local regulations may be more stringent than federal regulations.

13. DISPOSAL CONSIDERATIONS (CONTINUED)

Container Disposal Containers should be cleaned of residual product before disposal or return. Since emptied containers retain product residue, follow label warnings even after container is emptied. Empty containers should be disposed of or shipped in accordance with all applicable laws and regulations.

14. TRANSPORT INFORMATION

Regulatory Information	UN Number	Proper Shipping Name	Class	PG	Label	Additional Information
US DOT (Land)	**N/R**	**N/R**	**N/R**	**N/R**	**N/R**	This product is ***not regulated*** as hazardous by DOT, per 49CFR §173.154 (d) exception for materials corrosive to metals (steel and/or aluminum).
US DOT (Air) ***Canada TDG*** ***IMDG*** ***IATA / ICAO***	**UN3267**	***Corrosive liquid, basic, organic, n.o.s.*** (Tetrasodium EDTA, Sodium hydroxide)	**8**	**III**	**Corrosive**	

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Environmentally Hazardous Substances
[49 CFR 172.101, Appendix A] Sodium hydroxide: RQ = 1000 lbs (454 kg)

15. REGULATORY INFORMATION

Regulatory Lists / Inventories: The components are subject to the following regulatory lists and inventories:

Substance Name	*CAA*	*CERCLA*	*IARC*	*US STATE RIGHT-TO-KNOW LISTS*	*CA PROP 65*	*SARA*
Tetrasodium EDTA	N/R	N/R	N/R	N/R	N/R	N/R
Sodium hydroxide	N/R	**X**	N/R	**CA / FL / IL / MA / MN / NJ / PA / RI**	N/R	N/R
Trisodium NTA	N/R	N/R	**X**	**MA**	**X** (See note 1)	N/R
Trisodium ED3A	N/R	N/R	N/R	N/R	N/R	N/R
Water	N/R	N/R	N/R	N/R	N/R	N/R

1. A related product "Trisodium NTA monohydrate" [CAS #18662-53-8] is known to the State of California to cause cancer and is reportable under Proposition 65.

National Chemical Inventories Status:

Substance Name	US TSCA	Canada		EU EINECS	Australia AICS	New Zealand NZIoC	Japan ENCS	Korea KECI	Philippines PICCS	China IECSC
		DSL	NDSL							
Tetrasodium EDTA	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**
Water	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**
Sodium hydroxide	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**
Trisodium NTA	**X**	**X**		**X**	**X**	**X**	**X**	**X**	**X**	**X**
Trisodium ED3A	**X**	**X**				**X**			**X**	**X**

15. REGULATORY INFORMATION (CONTINUED)

Legend

AICS	Australian Inventory of Chemical Substances
CA LIST	California – Directors List of Hazardous Substances
CA PROP 65	California Proposition 65
CAA	Clean Air Act, Section 112
CERCLA	CERCLA Hazardous Substances
DSL	Domestic Substances List – Canada
EINECS	European Inventory of Existing Commercial Chemical Substances
ENCS	Japan Existing and New Chemical Substances
FL LIST	Florida – Substance List
IARC	International Agency for Research on Cancer – Carcinogens – Groups 1, 2A or 2B
IECSC	China – Inventory of Existing Chemical Substances
IL LIST	Illinois Toxic Substances Disclosure to Employees Act
KECI	Korea Existing Chemicals Inventory
LA LIST	Louisiana Right-to-Know Reporting List
MA LIST	Massachusetts – R-T-K Substance List
MN LIST	Minnesota – Hazardous Substance List
NDSL	Non-Domestic Substances List – Canada
NJ R-T-K	New Jersey – R-T-K Hazard List
N/R	Non Regulated
NZIoC	New Zealand Inventory of Chemicals
PA LIST	Pennsylvania Hazardous Substance List
PICCS	Philippines Inventory of Chemicals and Chemical Substances
RI LIST	Rhode Island – Hazardous Substance List
SARA	SARA Title III, Section 302 / 313
TSCA	Toxic Substances Control Act – USA
X	Listed and/or Regulated

***CANADA – WHMIS* (Workplace Hazardous Materials Information System)**

Class D2A	Other toxic effects
Class E	Corrosive to metal

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* (CPR) and the MSDS contains all the information required by the CPR.

Other Regulatory Information

The Cosmetic Ingredient Review (CIR) Expert Panel has determined that EDTA and its salts are safe as used in cosmetic formulations.

Contact AkzoNobel for additional information regarding the use and approval of Dissolvine E-39 (Tetrasodium EDTA) as a direct or indirect food additive.

16. OTHER INFORMATION

HMIS RATING **Health:** 2* / **Flammability:** 0 / **Physical Hazard:** 0 / **Other:** none
[0 – Minimal / 1 – Slight / 2 – Moderate / 3 – High / 4 – Extreme / * - Chronic Health Hazard (see Section 11)]

Trademark Dissolvine® is a registered trademark of Akzo Nobel Chemicals B.V.

Date of Issue / Revision July 21, 2009

Revision # 21.0

Changes Sections 2, 11, 15

Prepared by AkzoNobel, Technology & Engineering, Regulatory Toxicology
Tel. 613.273.8095

Disclaimer

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