

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**Product Name:** Dissolvine® D-Fe-3  
**Chemical Name:** Iron, N,N-bis[2-[bis(carboxymethyl)amino]ethyl]glycine sodium complexes (in water)  
**Synonym:** Diethylenetriaminepentaacetic acid (DTPA), ferric disodium complex  
**C.A.S. Registry No.:** Mixture  
**Chemical Formula:** Mixture  
**Product Use:** Plant nutrient / chelating agent

### Manufacturer / Supplier

Akzo Nobel Functional Chemicals LLC  
Chelates Americas  
525 West Van Buren St., Chicago, IL 60607  
Tel. 1-800-906-7979

### Emergency Telephone Numbers

**FOR 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

**FOR MEDICAL / HANDLING EMERGENCIES: 1-914-693-6946** [AkzoNobel - USA]

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## 2. HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

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

#### **WARNING !**

- **Causes eye irritation.**
- **Corrosive to steel and aluminum.**
- **Contains a small amount of impurity (Trisodium NTA) which has been shown to cause kidney damage and cancer (based on animal data).**
- **Possible Development Hazard – Contains DTPA salt that may adversely affect the developing fetus based on animal data.**

**Appearance and odor:** Odorless red-brown liquid at 25°C (77°F).

**POTENTIAL HEALTH EFFECTS** (See section 11 for additional information)

**Primary Route(s) of Exposure:** Skin contact, eye contact and inhalation.

#### **Acute Exposure**

- **Inhalation:** Exposure to an excessive concentration of vapor, mist or aerosol may cause respiratory tract discomfort.
- **Skin Contact:** Skin contact is not expected to cause irritation.
- **Eye Contact:** Eye contact may cause irritation.
- **Ingestion:** This product may cause irritation of the mouth, throat and digestive tract.

## 2. HAZARDS IDENTIFICATION (CONTINUED)

**Medical conditions aggravated:** Zinc deficiency may be aggravated by systemic exposure to DTPA and its sodium salts.

**Carcinogenicity:** IARC, NTP, ACGIH and OSHA do not classify this material as a carcinogen or suspect carcinogen. 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.

**Chronic Effect / Developmental:** May adversely affect the developing fetus, based on animal data with a related product.

### POTENTIAL ENVIRONMENTAL EFFECTS [See section 12 for additional information]

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

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENTS</u> [See section 8 for exposure limits]	<u>% (w/w)</u>	<u>CAS Number</u>
DTPA, ferric disodium complex	23 – 28	100208-96-6
Ferric sodium EDTA	2 – 4	15708-41-5
Sodium nitrate	14 – 16	7631-99-4
Ammonium nitrate	0.5 – 2	6484-52-2
Trisodium nitrilotriacetic acid (NTA)	0.7 – 1.4	5064-31-3
Water	45 – 65	7732-18-5

## 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 if eye irritation occurs.

**Ingestion:** Give several glasses of water. DO NOT induce vomiting. If vomiting occurs keep head below hips to reduce risk of aspiration. Give fluids again. Never give anything by mouth to a person who is unconscious or convulsing. Get medical attention if health effects occur.

**Note to Physician:** Attending physician should treat exposed patients symptomatically.

## 5. FIRE FIGHTING MEASURES

<b>Conditions of Flammability:</b>	not flammable or combustible
<b>Flash Point (Method):</b>	not applicable
<b>Upper Flammable Limit (% by volume):</b>	not determined
<b>Lower Flammable Limit (% by volume):</b>	not determined
<b>Auto-Ignition Temperature:</b>	not determined

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

## 5. FIRE FIGHTING MEASURES (CONTINUED)

**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.

**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.

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

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

## 6. ACCIDENTAL RELEASE MEASURES

**Spill/Leak:** Safely stop source of spill. Dike area to prevent spill from spreading. Restrict non-essential personnel from area. All personnel involved in spill cleanup should avoid skin and eye contact by wearing appropriate personal protective equipment.

**Cleanup:** Soak up liquid with a suitable absorbent such as clay, sawdust or kitty litter. Sweep up absorbed material and place in a chemical waste container for disposal according to local, state or federal regulations. Then flush area with water.

## 7. HANDLING AND STORAGE

**Handling:** Avoid inhalation and 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 or bituminized tanks. Avoid contact with aluminum, copper, copper alloys, nickel and zinc.

**Maximum Storage Temperature:** Store in a cool and dry place (below 25°C / 77°F). Do not store below crystallization temperature (5°C / 41°F).

**General Comments:** Containers should not be opened until ready for use. Exposure to sunlight may cause degradation of the product.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### Exposure Limits:

Chemical Name	OSHA – PELs (mg / m <sup>3</sup> )		ACGIH – TLVs (mg / m <sup>3</sup> )		NIOSH – RELs (mg / m <sup>3</sup> )		AIHA – WEELs (mg / m <sup>3</sup> )	
	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)	TWA	STEL / CEIL(C)
DTPA, ferric disodium complex	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Ferric sodium EDTA	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Sodium nitrate	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Ammonium nitrate	N/D	N/D	N/D	N/D	N/D	N/D	N/D	N/D
Trisodium NTA	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, 2008 Edition]

## 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 vapor in the air.

### Personal Protective Equipment (PPE)

- **Respiratory Protection:** Use of respiratory protection is generally not required. However, if use conditions generate vapor, mist or aerosol and adequate ventilation (e.g., outdoor or well-ventilated area) is not available, use a NIOSH-approved organic vapor respirator with dust, mist and fume 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 Protection:** Skin contact with the product should be minimized through the use of suitable protective clothing, gloves and footwear selected according to use condition exposure potential. For permanent (>480 minutes) and/or full contact use, 100% nitrile gloves are recommended.
- **Eye Protection:** Since eye contact causes irritation, chemical goggles and/or a face shield should be worn when handling this product.

**Other Protection:** 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. Eyewash fountains, or other means of washing the eyes with a gentle flow of cool to tepid tap water, should be readily available in all areas where this material is handled or stored. Water should be supplied through insulated and heat-traced lines to prevent freeze-ups in cold weather.

#### 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		

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State / Appearance / Odor:</b>	odorless red-brown liquid at 25°C (77°F)
<b>Boiling Point:</b>	~ 212°F (100°C)
<b>Bulk Density:</b>	not applicable
<b>Cloud Point:</b>	not determined
<b>Evaporation Rate (Butyl Acetate=1):</b>	not determined
<b>Melting Point:</b>	< 41°F (< 5°C) (crystallization point /range)
<b>Odor Threshold:</b>	not determined
<b>pH:</b>	6 – 8 (1% solution)
<b>Partition Coefficient (n-Octanol/water)</b>	log Pow < 0 <sup>3</sup>
<b>Pour Point:</b>	not determined
<b>Solubility in water:</b>	completely miscible
<b>Solubility in other solvents:</b>	not determined
<b>Specific Gravity (H<sub>2</sub>O = 1):</b>	1.25 – 1.30
<b>Vapor Density (Air = 1):</b>	same as water
<b>Vapor Pressure:</b>	same as water
<b>Viscosity:</b>	not determined
<b>Volatiles (% by weight):</b>	not determined
<b>Other – Decomposition temperature:</b>	~ 212°F (100°C) for water loss
<b>Conditions of Flammability:</b>	not flammable or combustible
<b>Flash Point (Method):</b>	not applicable
<b>Upper Flammable Limit (% by volume):</b>	not applicable
<b>Lower Flammable Limit (% by volume):</b>	not applicable

## 9. PHYSICAL AND CHEMICAL PROPERTIES (CONTINUED)

**Auto-ignition Temperature:** not applicable  
< : less than > : greater than ~ : approximately

## 10. STABILITY AND REACTIVITY

**Stability:** This product is stable at ambient temperatures and atmospheric pressures. It is not self-reactive and is not sensitive to physical impact.

**Incompatibilities / Conditions to avoid:** This product is incompatible with strong oxidizers. Avoid contact with aluminum, nickel, zinc, copper and copper alloys. To ensure product integrity, do not expose product to temperatures above 212°F (100°C) for extended periods of time.

**Polymerization:** Hazardous polymerization is not expected to occur under normal temperatures and pressures.

**Decomposition Products:** Under fire conditions the product may support combustion and decomposes to give off carbon oxides fumes (CO, CO<sub>2</sub>), nitrogen oxides and water vapor.

## 11. TOXICOLOGICAL INFORMATION

### **INHALATION**

**Acute exposure:** The acute LC<sub>50</sub> for this product is not available. The LC<sub>50</sub> for Trisodium NTA component is greater than 5 mg/L (rats / 4-hr test).

**Chronic exposure:** No known effects for the mixture.

### **SKIN**

**Acute contact:** Dermal toxicity for this product is not available. However, it is not considered a skin irritant based on tests on rabbit skin with a structurally related product.

**Chronic contact:** No known effects for the mixture.

**EYES:** This product is irritating to rabbit eyes.

### **INGESTION**

**Acute exposure:** The oral LD<sub>50</sub> is expected to be greater than 2,000 mg/kg (rat). The LD<sub>50</sub> for some of the components are as follows:

- Ferric Sodium EDTA: > 3980 mg/kg (rat) Sodium nitrate: 1267 mg/kg (rat)
- Ammonium nitrate: 2217 mg/kg (rat) Trisodium NTA: 1100 – 3900 mg/kg (rat)

**Chronic exposure:** Chronic ingestion of NTA and its trisodium salt has been shown to cause kidney toxicity.

**SENSITIZATION:** No data available for the mixture.

**CARCINOGENICITY:** IARC, NTP, ACGIH and OSHA do not classify this material as a carcinogen or suspect carcinogen. 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:** No data available for the mixture. 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. Ferric sodium EDTA component, when tested as a pure substance, gave a negative response in the Ames Assay and the E. Coli bacterial reversion assay, but a positive response in the Mouse Lymphoma Assay with and without metabolic activation at concentrations which were cytotoxic. The positive response was attributed to a possible sensitivity of the cells to abnormal iron concentrations.

## 11. TOXICOLOGICAL INFORMATION (CONTINUED)

**REPRODUCTIVE TOXICITY:** The following data is available for a related product, Pentasodium DTPA (Na<sub>5</sub>DTPA): "A maternally non-toxic dose (400 mg/kg) of a test article with 40% Na<sub>5</sub>DTPA, administered orally to pregnant rats, caused a significant increase in skeletal retardations in the developing fetuses. In the presence of maternal toxicity, a dose of 1000 mg/kg caused a statistically significant increase in skeletal malformations, variations, and retardations in rat fetuses. These effects may be due to zinc deficiency caused by chelation of zinc by Na<sub>5</sub>DTPA." Trisodium NTA is not teratogenic and did not induce reproductive toxicity.

**TARGET ORGANS:** Eyes, kidney and bladder, reproductive system.

## 12. ECOLOGICAL INFORMATION

**Ecotoxicity:** No data available on the mixture. Trisodium NTA and Ferric sodium EDTA components have shown low to moderate toxicity to fish. The LC<sub>50</sub> (24/48-hr) of Ferric disodium DTPA for *Daphnia carinata* is greater than 1000 mg/L.

**Biodegradation:** This product is not expected to be readily biodegradable (based on tests with structurally related products).

**Other Ecotoxicity information:** Bioaccumulation: Log P<sub>ow</sub> = < 0 (based on structurally related product)

## 13. DISPOSAL CONSIDERATIONS

**Waste Disposal:** In its unused condition, this product is not considered to be a RCRA-defined hazardous waste by characteristics or listings. 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.

**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

### Shipping Information:

US DOT	<b>Domestic Land Shipments (motor vehicle or rail car):</b> This product is <b>not regulated</b> as hazardous substance by DOT, per 49CFR §173.154 (d) exception for materials corrosive to metals (steel and/or aluminum).
CANADA – TDG IMDG / IATA / ICAO	<b>Corrosive liquid, n.o.s.</b> (Diethylenetriaminepentaacetic acid ferric disodium complex) UN1760, 8, PG III

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### Required Labels:

- **Domestic land shipments:** No transport label required
- **Air / Water / International shipments:** Corrosive labels required

**Environmentally Hazardous Substances [49 CFR 172.101, Appendix A]:** None

## 15. REGULATORY INFORMATION

The components are subject to the following environmental regulatory lists:

Substance Name	CAA	CERCLA	IARC	USA STATE RIGHT-TO-KNOW LISTS	CA PROP 65	SARA
DTPA, ferric disodium complex	N/R	N/R	N/R	N/R	N/R	N/R
Ferric sodium EDTA	N/R	N/R	N/R	N/R	N/R	N/R
Sodium nitrate	N/R	N/R	N/R	MA / NJ / PA / RI	N/R	X 313 (see note 2)
Ammonium nitrate	N/R	N/R	N/R	MA / NJ / PA / RI	N/R	X 313 (see note 2)
Trisodium NTA	N/R	N/R	X (Gr. 2B)	MA	X (see note 1)	N/R
Water	N/R	N/R	N/R	N/R	N/R	N/R

- 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.
- The nitrate compounds in this product are subject to SARA Title III, Section 313 supplier notification/release reporting requirements under the "Nitrate Compounds" category (Code N511 – water dissociable nitrate; reportable only when in aqueous solution). This product contains approximately 15% sodium nitrate and 1.5% ammonium nitrate.

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							
DTPA, ferric disodium complex	X		X (see note 3)	X	X					X
Ferric sodium EDTA	X	X		X	X	X	X	X	X	X
Sodium nitrate	X	X		X	X	X	X	X	X	X
Ammonium nitrate	X	X		X	X	X	X	X	X	X
Trisodium NTA	X	X		X	X	X	X	X	X	X
Water	X	X		X	X	X	X	X	X	X

- Exempt from CEPA New Substances Notifications if registered as micronutrient under the Fertilizers Act in Canada and sold in Canada only for that use.

N/R = Non Regulated

X = Listed and/or Regulated

### 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
NZIoC	New Zealand Inventory of Chemicals
PA List	Pennsylvania Hazardous Substance List
PICCS	Philippines Inventory of Chemicals and Chemical Substances

## 15. REGULATORY INFORMATION (CONTINUED)

RI List Rhode Island – Hazardous Substance List  
SARA SARA Title III, Section 302 / 313  
TSCA Toxic Substances Control Act – USA

### CANADA

- ◆ **WHMIS (Workplace Hazardous Materials Information System):**
  - **Class D2A, D2B [Material causing 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.
- ◆ **Micronutrient Registration - Canadian Food Inspection Agency (CFIA):** Dissolvine D-FE-3 is a registered micronutrient in Canada under the Fertilizers Act [Registration Number 2006008B]

**Other Regulatory Information:** None known.

## 16. OTHER INFORMATION

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

**Other Information:** Dissolvine® is a registered trademark of Akzo Nobel Chemicals B.V.

**Changes:** Section 16 / Logo / Format

**Prepared by:** AkzoNobel, Technology & Engineering (Regulatory Toxicology) / Tel. 613.273.8095

The information in this Material Safety Data Sheet should be provided to all who will use, handle, store, transport or otherwise be exposed to this product. Akzo Nobel Functional Chemicals LLC makes no warranty, express or implied as to the product's merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. Nothing contained herein shall be construed as granting or extending any license under any patent. Buyer shall determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes, including mixing with other products. The information contained herein supersedes all previously issued bulletins on the subject matter covered. If the date of this document is more than three years old, please call to ensure that this sheet is current.

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