

(Material) Safety Data Sheet



Section 1 - Product and Company Identification

Material Name	▪ DE NickelPhos Electrolytic Plating Solution
Product Description	▪ Green solution.
Manufacturer	▪ PALM International Manufacturing Company 1289 Bridgestone Pkwy LaVergne, TN 37086 United States
Telephone	
General	▪ 615-641-1200
<u>Emergency</u>	▪ 800-424-9300 - CHEMTREC
Preparation Date	▪ 10/07/2009
Last Revision Date	▪ 07/26/2011

Section 2 - Hazards Identification

EMERGENCY OVERVIEW

DANGER

May cause respiratory irritation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May damage fertility or the unborn child - via inhalation or ingestion. May cause cancer via Inhalation. Toxic to aquatic life. Toxic to aquatic life with long lasting effects.

Prevention	P261: Avoid breathing mist, vapours or spray. P281: Use personal protective equipment as required. P280: Wear protective gloves, clothing -Synthetic Apron, and eye/face protection -goggles. P271: Use only outdoors or in a well-ventilated area. P285: In case of inadequate ventilation wear respiratory protection. P233: Keep container tightly closed. P201: Obtain special instructions before use. P202: Do not handle until all safety precautions have been read and understood. P264: Wash thoroughly after handling. P272: Contaminated work clothing should not be allowed out of the workplace. P273: Avoid release to the environment.
Response	P304+P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P342+P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. P302+P352: IF ON SKIN: Wash with plenty of soap and water. P362: Take off contaminated clothing and wash before reuse. P333+P313: If skin irritation or rash occurs: Get medical advice/attention. P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P337+P313: If eye irritation persists: Get medical advice/attention.
Storage/Disposal	P405: Store locked up. P403+P233: Store in a well-ventilated place. Keep container tightly closed. P501: Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.



Physical Form

Color

Odor

OSHA

WHMIS

- Liquid
- Green
- Odorless
- Irritant, Carcinogen
- Class D - Poisonous and Infectious Materials - Division 2 - Subdivision A, Class D - Poisonous and Infectious Materials - Division 2 - Subdivision B



EU

- Dangerous to the Environment - N, Toxic - T, Sensitizer - , Irritant - Xi, Substances Toxic To Reproduction - Category 2 - Repr.Cat.2, Mutagenic Substances - Category 3 - Muta.Cat.3, Carcinogenic Substances - Category 1 - Carc.Cat.1
- R50, R53, R68, R36/37/38, R42/43, R48/23, R49, R60, R61



GHS

- Acute Hazards to the aquatic environment - Category 2, Chronic Hazards to the aquatic environment - Category 2, Specific Target Organ Toxicity Single Exposure - Category 3, Skin Corrosion/Irritation - Category 2, Serious Eye Damage, Eye Irritation - Category 2A, Respiratory Sensitizer - Category 1, Skin Sensitizer - Category 1, Toxic to Reproduction - Category 1, Carcinogenicity - Category 1A
- Inhalation, Ingestion/Oral
- Inhalation of product may aggravate existing chronic respiratory problems such as asthma, emphysema or bronchitis. Skin contact may aggravate existing skin disease. Nickel "itch" and/or asthma in persons hypersensitive to nickel.

Route Of Entry

Medical Conditions

Aggravated by Exposure

NFPA



Potential Health Effects

Inhalation

Acute (Immediate)

- May cause respiratory irritation. May cause sensitization of the respiratory system with shortness of breath.
- Repeated and prolonged exposure may cause cancer.

Chronic (Delayed)

Skin

Acute (Immediate)

- May cause skin irritation. May cause skin sensitization. Symptoms of skin sensitization include redness and skin rash.

Chronic (Delayed)

- Repeated and prolonged exposure to nickel compounds can cause a type of dermatitis specifically referred to as "nickel" itch.

Eye

Acute (Immediate)

- Causes serious eye irritation.

Chronic (Delayed)

- No data available.

Ingestion

Acute (Immediate)

- May cause irritation if swallowed. May cause gastrointestinal disturbances including diarrhea, nausea, and vomiting.

Chronic (Delayed)

- No data available.

Carcinogenic Effects

- This product contains a component that is a known carcinogen.

Carcinogenic Effects			
	CAS	NTP	IARC
Nickel(II) sulfate (1:1)	7786-81-4	Not Established	Group 1-Carcinogenic
Nickel(II) sulfate (1:1) as Nickel Compounds	NDA	Known Human Carcinogen	Group 1-Carcinogenic
Boric acid	10043-35-3	Evidence of Carcinogenicity	Not Established

Reproductive Effects

- Nickel sulfate may cause harm to unborn child. Boric acid may cause impaired fertility or may cause harm to unborn child.

Potential Environmental Effects

- May cause long lasting harmful effects to aquatic life. Dangerous to aquatic life in high concentrations.

See Section 12 for Ecological Information. See Section 15 for full text of EU R-phrases.

Section 3 - Composition/Information on Ingredients

Hazardous Components						
Chemical Name	CAS	%(wt)	UN;EINECS	LD50/LC50	EU R & S Phrases	Other
Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	232-104-9	NDA	Xn; R20/22 Xi; R38 R42/43 T; R48/23 Carc.Cat.1; R49 N; R50 R53 Repr.Cat.2; R61 Muta.Cat.3; R68	NDA
Glycolic acid, monosodium salt	2836-32-0	< 10%	220-624-9	Ingestion/Oral-Rat LD50 · 7110 mg/kg	NDA	NDA
Boric acid	10043-35-3	< 5%	233-139-2	Ingestion/Oral-Rat LD50 · 2660 mg/kg Ingestion/Oral-Rat LD50 · 2500 mg/kg	Repr.Cat.2; R60 R61	NDA
Citric acid	77-92-9	< 5%	201-069-1	Ingestion/Oral-Rat LD50 · 3 g/kg	NDA	NDA
Phosphorous acid	13598-36-2	< 5%	237-066-7	Ingestion/Oral-Rat LD50 · 1895 mg/kg Skin-Rat LD50 · >5000 mg/kg Inhalation-Rat LC50 · >2.06 g/m ³ 4 Hour(s)	Xn; R22 C; R35	Alternate CAS: 13598-36-2Y
Non-Hazardous Components						
Chemical Name	CAS	%(wt)	UN;EINECS	LD50/LC50	EU R & S Phrases	Other
Water	7732-18-5	> 50%	231-791-2	Ingestion/Oral-Rat LD50 · >90 mL/kg	NDA	NDA

Under United States Regulations (29 CFR 1900.1200 - Hazard Communication Standard), this product is considered hazardous. In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS). According to European Directive 1999/45/EC this preparation is considered dangerous. According to the Globally Harmonized Standard for Classification and Labeling (GHS) this product is considered hazardous.

See Section 11 for Toxicological Information.

Section 4 - First Aid Measures

Inhalation

- Move victim to fresh air. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Do not use mouth-to-mouth method if victim inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

- | | |
|------------------|--|
| Skin | <ul style="list-style-type: none"> In case of contact with substance, immediately flush skin with running water for at least 20 minutes. For minor skin contact, avoid spreading material on unaffected skin. Remove and isolate contaminated clothing and shoes. |
| Eye | <ul style="list-style-type: none"> In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. |
| Ingestion | <ul style="list-style-type: none"> Induce vomiting (only in conscious persons) Get medical attention immediately. |

See Section 2 for Potential Health Effects.

Section 5 - Fire Fighting Measures

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| Extinguishing Media | <ul style="list-style-type: none"> LARGE FIRE: Water spray, fog or regular foam. SMALL FIRES: Dry chemical, CO₂, water spray or regular foam. |
| Unsuitable Extinguishing Media | <ul style="list-style-type: none"> No data available. |
| Firefighting Procedures | <ul style="list-style-type: none"> Move containers from fire area if you can do it without risk. LARGE FIRES: Dike fire-control water for later disposal. |
| Unusual Fire and Explosion Hazards | <ul style="list-style-type: none"> In the presence of sulfur or sulfates nickel sulfate may react with CO₂ to form nickel carbonyl. |
| Hazardous Combustion Products | <ul style="list-style-type: none"> Sulfur oxides and nickel oxides may form under fire conditions. |
| Protection of Firefighters | <ul style="list-style-type: none"> Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible. Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection. Wear positive pressure self-contained breathing apparatus (SCBA). |

Section 6 - Accidental Release Measures

- | | |
|--|---|
| Personal Precautions | <ul style="list-style-type: none"> Do not touch or walk through spilled material Do not touch damaged containers or spilled material unless wearing appropriate protective clothing Ventilate enclosed areas |
| Emergency Procedures | <ul style="list-style-type: none"> As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area) Stop leak if you can do it without risk Stay upwind Keep unauthorized personnel away Ventilate closed spaces before entering |
| Environmental Precautions Containment/Clean-up Measures | <ul style="list-style-type: none"> Prevent material from entering public sewer system or any waterways. SMALL SPILLS: Take up with sand or other non-combustible absorbent material and place into containers for later disposal. LARGE SPILLS: Dike far ahead of spill for later disposal. Spills may be reportable to the National Response Center (800-424-8802) and to state and/or local agencies. |

Section 7 - Handling and Storage

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|-------------------------|--|
| Handling Storage | <ul style="list-style-type: none"> Do not breathe vapor or spray mist. Use only with adequate ventilation. Store in a well-ventilated place. Keep container tightly closed. Store locked up. Store above 50° F to avoid product crystallization. |
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Section 8 - Exposure Controls/Personal Protection

Personal Protective Equipment

Pictograms



Respiratory

Eye/Face

Hands

Skin/Body

Engineering

Measures/Controls

- In case of insufficient ventilation, wear suitable respiratory equipment.
- Wear splash goggles.
- Wear appropriate gloves.
- Wear protective clothing -Synthetic apron and other clothing to prevent skin contact.
- Adequate ventilation systems as needed to control concentrations of airborne contaminants below applicable threshold limit values.

Exposure Limits/Guidelines						
	Result	ACGIH	Canada Ontario	Canada Quebec	NIOSH	OSHA
Boric acid (10043-35-3)	STELs	6 mg/m3 STEL (inhalable fraction)	6 mg/m3 STEV (inhalable)	Not established	Not established	Not established
	TWAs	2 mg/m3 TWA (inhalable fraction)	2 mg/m3 TWAEV (inhalable)	Not established	Not established	Not established
Nickel(II) sulfate (1:1) as Nickel soluble compounds	TWAs	Not established	0.1 mg/m3 TWAEV (inhalable, as Ni) as Nickel soluble compounds	0.1 mg/m3 TWAEV (as Ni) as Nickel soluble compounds	0.015 mg/m3 TWA (except Nickel carbonyl, as Ni) as Nickel compounds	1 mg/m3 TWA (as Ni) as Nickel soluble compounds

Key to abbreviations

STEL	=	Short Term Exposure Limits are based on 15-minute exposures	NIOSH	=	National Institute of Occupational Safety and Health
STEV	=	Short Term Exposure Value	OSHA	=	Occupational Safety and Health Administration
TWAEV	=	Time-Weighted Average Exposure Value			
TWA	=	Time-Weighted Averages are based on 8h/day, 40h/week exposures			
ACGIH	=	American Conference of Governmental Industrial Hygiene			

Section 9 - Physical and Chemical Properties

Physical Form

Appearance/Description

- Liquid
- Green solution with no odor.

Color: Green/clear	Odor: Odorless
Taste: NDA	Odor Threshold: NDA
Boiling Point: 101 C(213.8 F)	Vapor Pressure: NDA
Freezing Point: 0 C(32 F)	Vapor Density: NDA
Specific Gravity/Relative Density: = 1.1 Water=1	Evaporation Rate: < 1 n-Butyl Acetate = 1
Density: = 9.2 lbs/gal	VOC (Wt.): NDA
Bulk Density: NDA	VOC (Vol.): NDA
pH: > 2	Volatiles (Wt.): NDA
Water Solubility: NDA	Volatiles (Vol.): NDA
Solvent Solubility: NDA	Flash Point: NDA
Viscosity: NDA	Flash Point Test Type: NDA
Half-Life: NDA	UEL: NDA
Octanol/Water Partition NDA	LEL: NDA

coefficient:			
Coefficient of water/oil distribution:	NDA	Autoignition:	NDA
Bioaccumulation Factor:	NDA	Bioconcentration Factor:	NDA
Biochemical Oxygen Demand BOD/BOD5:	NDA	Chemical Oxygen Demand:	NDA
Persistence:	NDA	Degradation:	NDA

Section 10 - Stability and Reactivity

Stability	<ul style="list-style-type: none"> Stable under normal temperatures and pressures.
Hazardous Polymerization	<ul style="list-style-type: none"> Hazardous polymerization will not occur.
Conditions to Avoid	<ul style="list-style-type: none"> Excess heat or cold.
Incompatible Materials	<ul style="list-style-type: none"> Strong oxidizers.
Hazardous Decomposition Products	<ul style="list-style-type: none"> Extremely high temperatures may cause hazardous decomposition and form metal oxides and toxic fumes. Sulfur oxides, nickel oxides.

Section 11 - Toxicological Information

Other Material Information	<ul style="list-style-type: none"> No toxicological data for material as a whole. Based on components this material may cause irritation to respiratory system, skin and eyes. May cause skin and respiratory sensitization as well as reproductive effects. Contains nickel sulfate which is a known carcinogen.
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Component Name	Concentration	CAS	Data
Water	> 50%	7732-18-5	Acute Toxicity: ; orl-rat LD50:>90 mL/kg; orl-rbt TDLo:3502 gm/kg/2W-I
Nickel(II) sulfate (1:1)	10% TO 20%	7786-81-4	Acute Toxicity: ; orl-rat LDLo:172 mg/kg; ihl-rat TCLo:10 mg/m3/4H/39W-I; skn-hmn TCLo:2.5 pph/48H-C Irritation: ; skn-hmn 5%/48H Mutagen: ; dnd-rat-ihl 0.03 ug/L/5D/3W-I Reproductive: ; orl-mus TDLo:250 mg/kg (5W male)
Glycolic acid, monosodium salt	< 10%	2836-32-0	Acute Toxicity: ; orl-rat LD50:7110 mg/kg; orl-rat TDLo:78 gm/kg/78D-C
Boric acid	< 5%	10043-35-3	Acute Toxicity: ; orl-rat LD50:2500 mg/kg; orl-rat TDLo:1617 mg/kg/1D-C; ihl-rat TCLo:10 mg/m3/4H/16W-I Irritation: ; skn-hmn 15 mg/3D-I MLD Reproductive: ; orl-mus TDLo:152 mg/kg (multigenerations); orl-rat TDLo:750 mg/kg (10D preg); orl-rat TDLo:250 mg/kg (10D preg); ihl-rat TCLo:9600 ug/m3/4H (16W male)
Citric acid	< 5%	77-92-9	Acute Toxicity: ; orl-rat LD50:3 gm/kg Irritation: ; eye-rbt 750 ug/24H SEV; skn-rbt 0.5 mL MOD
Phosphorous acid	< 40%	13598-36-2	Acute Toxicity: ; orl-rat LD50:1895 mg/kg; ihl-rat LC50:>2.06 gm/m3/4H; ihl-hmn TCLo:1.2 mg/m3; skn-rat LD50:>5000 mg/kg

Key to abbreviations

TC = Toxic Concentration	MLD = Mild
TD = Toxic Dose	SEV = Severe
LD = Lethal Dose	LC = Lethal Concentration

Section 12 - Ecological Information

DE NickelPhos Electrolytic NiP Plating Solution						
Dosage	Units	Species	Species Description	Duration	Results	Comments
160	ppm	Fish	Rainbow Trout	48 Hour(s)	NDA	NDA
13.9	ppm	Crustacea	Prawn	48 Hour(s)	NDA	LC50

Ecological Fate	▪ No data available
Persistence/Degradability	▪ Nickel can remain in natural waters indefinitely.
Bioaccumulation Potential	▪ No data available.
Mobility in Soil	▪ No data available.
Other Information	▪ Dangerous to aquatic life in high concentrations. May be dangerous if it enters water intakes. Notify local health and wildlife officials. Notify operators of nearby water intakes.

Section 13 - Disposal Considerations

Product	▪ Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.
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Section 14 - Transportation Information

DOT Transportation Other Information: Appendix A to 49 CFR 172.101 lists the reportable quantity for nickel sulfate to be 100 lbs/45.4 kg as dry nickel sulfate crystals. The equivalent RQ for this product is 500 lbs/227 kg or 54 gallons.

DOT - United States - Department of Transportation

Shipping Name: RQ, Environmental Hazardous Substance, Liquid, N.O.S. (Nickel Sulfate)

ID Number: UN3082

Hazard Class: 9

Packing Group: III

TDG - Canada - Transport of Dangerous Goods

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

ID Number: UN3082

Hazard Class: 9

Packing Group: III

Marine Pollutant: Marine Pollutant

IMO/IMDG - International Maritime Transport

Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S.

ID Number: UN3082

Hazard Class: 9

Packing Group: III

ADN - Europe Transport of Dangerous Goods by Road/Inland Waterway

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

ID Number: UN3082

Hazard Class: 9

Labeling Class: 9

Packing Group: III

IATA - International Air Transport Association

Shipping Name: Environmentally Hazardous Substance, Liquid, N.O.S.

ID Number: UN3082

Hazard Class: 9, Environmentally Hazardous Substances

Packing Group: III

ADR - Europe Transport of Dangerous Goods by Road/Inland Waterway

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

ID Number: UN3082

Hazard Class:9,Environmentally Hazardous Substances

Packing Group: III

RID - Europe Transport of Dangerous Goods by Railways

Shipping Name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

ID Number:UN3082

Hazard Class:9,Environmentally Hazardous Substances

Packing Group: III

Section 15 - Regulatory Information

**SARA Hazard Classifications
Risk & Safety Phrases**

- Acute, Chronic
- R50 Very toxic to aquatic organisms. R53 May cause long-term adverse effects in the aquatic environment. R36/37/38 Irritating to eyes, respiratory system and skin. R42/43 May cause sensitisation by inhalation and skin contact. R48/23 Toxic: danger of serious damage to health by prolonged exposure through inhalation. R49 May cause cancer by inhalation. R60 May impair fertility. R61 May cause harm to the unborn child. R68 Possible risk of irreversible effects. S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. S37 Wear suitable gloves. S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). S53 Avoid exposure - obtain special instructions before use. S57 Use appropriate containment to avoid environmental contamination. .

State Right To Know

Component	CAS	MA	NJ	PA
Water	7732-18-5	No	No	No
Nickel(II) sulfate (1:1)	7786-81-4	Yes	Yes	Yes
Glycolic acid, monosodium salt	2836-32-0	No	No	No
Boric acid	10043-35-3	No	No	No
Citric acid	77-92-9	No	No	No
Phosphorous acid	13598-36-2	No	Yes	No

Inventory

Component	CAS	Canada DSL	Canada NDSL	EU EINECS	EU ELNICS	TSCA
Water	7732-18-5	Yes	No	Yes	No	Yes
Nickel(II) sulfate (1:1)	7786-81-4	Yes	No	Yes	No	Yes
Glycolic acid, monosodium salt	2836-32-0	Yes	No	Yes	No	Yes
Boric acid	10043-35-3	Yes	No	Yes	No	Yes
Citric acid	77-92-9	Yes	No	Yes	No	Yes
Phosphorous acid	13598-36-2	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Ingredient Disclosure List

▪ Phosphorous acid	13598-36-2	< 5%	1 %
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	0.1 %
▪ Nickel(II) sulfate (1:1) as Nickel compounds	7786-81-4	10% TO 20%	0.1 %

▪ Boric acid	10043-35-3	< 5%	1 %
▪ Water	7732-18-5	> 50%	Not Listed

Environment

Canada - CEPA - Priority Substances List

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

Europe

Other

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification

▪ Phosphorous acid	13598-36-2	< 5%	Xn; R22 C; R35
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Xn; R20/22 Xi; R38 R42/43 T; R48/23 Carc.Cat.1; R49 N; R50 R53 Repr.Cat.2; R61 Muta.Cat.3; R68
▪ Nickel(II) sulfate (1:1) as Nickel compounds	7786-81-4	10% TO 20%	Xn; R20/22 Xi; R38 R42/43 T; R48/23 Carc.Cat.1; R49 N; R50 R53 Repr.Cat.2; R61 Muta.Cat.3; R68
▪ Boric acid	10043-35-3	< 5%	Repr.Cat.2; R60 R61
▪ Water	7732-18-5	> 50%	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	1%<=C: T; R48/23 0.1%<=C<1%: Xn; R48/20 20%<=C: Xi; R38 0.01%<=C: R43 25%<=C: N; R50-53 2.5%<=C<25%: N; R51-53 0.25%<=C<2.5%: R52-53
▪ Nickel(II) sulfate (1:1) as Nickel compounds	7786-81-4	10% TO 20%	1%<=C: T; R48/23 0.1%<=C<1%: Xn; R48/20 20%<=C: Xi; R38 0.01%<=C: R43 25%<=C: N; R50-53 2.5%<=C<25%: N; R51-53 0.25%<=C<2.5%: R52-53
▪ Boric acid	10043-35-3	< 5%	5.5%<=C: Repr.Cat.2; R60-61
▪ Water	7732-18-5	> 50%	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling

▪ Phosphorous acid	13598-36-2	< 5%	C R:22-35 S:(1/2)-26-36/37/39-45
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	T N R:49-61-20/22-38-42/43-48/23-68- 50/53 S:53-45-60-61
▪ Nickel(II) sulfate (1:1) as Nickel compounds	7786-81-4	10% TO 20%	T N R:49-61-20/22-38-42/43-48/23-68- 50/53 S:53-45-60-61
▪ Boric acid	10043-35-3	< 5%	T R:60-61 S:53-45
▪ Water	7732-18-5	> 50%	Not Listed

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed

▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	E
▪ Nickel(II) sulfate (1:1) as Nickel compounds	7786-81-4	10% TO 20%	E
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed
EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases			
▪ Phosphorous acid	13598-36-2	< 5%	S:(1/2)-26-36/37/39-45
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	S:53-45-60-61
▪ Nickel(II) sulfate (1:1) as Nickel compounds	7786-81-4	10% TO 20%	S:53-45-60-61
▪ Boric acid	10043-35-3	< 5%	S:53-45
▪ Water	7732-18-5	> 50%	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)		10% TO 20%	(includes any unique chemical substance that contains Nickel as part of its infrastructure)
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	(includes any unique chemical substance that contains Nickel as part of its infrastructure)
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
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▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	100 lb final RQ; 45.4 kg final RQ
▪ Nickel(II) sulfate (1:1) as Nickel compounds	7786-81-4	10% TO 20%	100 lb final RQ; 45.4 kg final RQ
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed
U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities			
▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs			
▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs			
▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed
U.S. - CERCLA/SARA - Section 313 - Emission Reporting			
▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)		10% TO 20%	0.1 % de minimis concentration (Chemical Category N495)
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	0.1 % de minimis concentration (Chemical Category N495)
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed
U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing			
▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

U.S. - RCRA (Resource Conservation & Recovery Act) - Hazardous Constituents - Appendix VIII to 40 CFR 261

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)		10% TO 20%	hazardous constituent - no waste number
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	hazardous constituent - no waste number
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

United States - California**Environment****U.S. - California - Proposition 65 - Carcinogens List**

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)		10% TO 20%	carcinogen, initial date 5/7/04
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	carcinogen, initial date 5/7/04
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

United States - Pennsylvania**Labor**

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	
▪ Nickel(II) sulfate (1:1) as Nickel compounds	7786-81-4	10% TO 20%	
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)	7786-81-4	10% TO 20%	Not Listed
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Not Listed
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

United States - Rhode Island**Labor****U.S. - Rhode Island - Hazardous Substance List**

▪ Phosphorous acid	13598-36-2	< 5%	Not Listed
▪ Glycolic acid, monosodium salt	2836-32-0	< 10%	Not Listed
▪ Nickel(II) sulfate (1:1)		10% TO 20%	Carcinogen
▪ Nickel(II) sulfate (1:1) as Nickel compounds		10% TO 20%	Carcinogen
▪ Boric acid	10043-35-3	< 5%	Not Listed
▪ Water	7732-18-5	> 50%	Not Listed

Section 16 - Other Information**Preparation Date**

- 10/07/2009

Last Revision Date

- 07/26/2011

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Key to abbreviations

NDA = No Data Available