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a xylem brand

Safety Data Sheet acc. to ISO/DIS 11014

Printing date 04/10/2014

Reviewed on 04/10/2014

1 Identification

- **Product identifier**
- **Trade name:** Vario Alkaline-Cyanide Reagent Solution
- **Catalogue number:** 251417Y
- **Relevant identified uses of the substance or mixture and uses advised against:** No further relevant information available.
- **Application of the substance / the mixture:** Reagent for water analysis
- **Manufacturer/Supplier:**
Tintometer Inc.
6456 Parkland Drive
Sarasota, FL 34243
USA
phone: (941) 756-6410
fax: (941) 727-9654
www.lovibond.us
Made in Germany
- **Distributor/Supplier:** YSI, Inc
Address 1700/1725 Brannum Lane
Yellow Springs, Ohio 45387
Telephone (937) 767-7241
E-mail MSDSinfo@Xylem Inc.com
- **Emergency telephone number:** Chemtrec® : (US & Canada) 800-424-9300 (International) +1 (703) 527-3887

* 2 Hazard(s) identification

- **Classification of the substance or mixture**

US-GHS



GHS06 Skull and crossbones

Acute Tox. 3 H301 Toxic if swallowed.
Acute Tox. 2 H310 Fatal in contact with skin.
Acute Tox. 3 H331 Toxic if inhaled.



GHS05 Corrosion

Met. Corr.1 H290 May be corrosive to metals.
Skin Corr. 1A H314 Causes severe skin burns and eye damage.

- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**



T; Toxic

R23/24/25: Toxic by inhalation, in contact with skin and if swallowed.



C; Corrosive

R34: Causes burns.



N; Dangerous for the environment

R50/53: Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

R32: Contact with acids liberates very toxic gas.

- **Label elements**
- **GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms** GHS05, GHS06
- **Signal word** Danger
- **Hazard-determining components of labeling:**
sodium cyanide

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sodium hydroxide

- **Hazard statements**

- H290 May be corrosive to metals.
 H301+H331 Toxic if swallowed or if inhaled.
 H310 Fatal in contact with skin.
 H314 Causes severe skin burns and eye damage.

- **Precautionary statements**

- P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
 P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P308 IF exposed or concerned:
 P310 Immediately call a POISON CENTER/doctor.
 P405 Store locked up.

- **Canadian Hazard Symbols:**



- **WHMIS classification:**

- D1A
 Very toxic material causing immediate and serious toxic effects
 E
 Corrosive material

- **NFPA ratings (scale 0 - 4)**



Health = 3
 Fire = 0
 Reactivity = 0

3 Composition/information on ingredients

- **Chemical characterization: Mixtures**
- **Description:** aqueous solution
- **Composition and Information on Ingredients:**

M-Factor: 10 (CAS 143-33-9)

CAS: 143-33-9 EINECS: 205-599-4 Index number: 006-007-00-5	sodium cyanide T+ R26/27/28; N R50/53 R32 Acute Tox. 2, H300; Acute Tox. 1, H310; Acute Tox. 2, H330; Aquatic Acute 1, H400; Aquatic Chronic 1, H410	5-10%
CAS: 1310-73-2 EINECS: 215-185-5 Index number: 011-002-00-6 RTECS: WB4900000	sodium hydroxide C R35 Met. Corr.1, H290; Skin Corr. 1A, H314	2.5-5%

- **REACH - pre-registered substances** All components are REACH pre-registered.
- **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First-aid measures

- **Description of first aid measures**
- **General information:**
 Personal protection for the First Aider.
 Provide oxygen treatment if affected person has difficulty breathing.
 Keep warm, position comfortably and cover well.
 Immediately remove any clothing soiled by the product.
 Remove breathing apparatus only after contaminated clothing have been completely removed.
- **After inhalation:**
 Supply fresh air or oxygen.
 Call a doctor immediately.

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In case of unconsciousness remove to fresh air, apply artificial respiration, and consult a physician.

- **After skin contact:**

Immediately rinse with plenty of water.

Call a doctor immediately.

- **After eye contact:**

Rinse opened eye for several minutes (15 min) under running water.

Call a doctor immediately.

- **After swallowing:**

Rinse out mouth and then drink 1-2 glasses of water.

Call a doctor immediately.

- **Most important symptoms and effects, both acute and delayed**

after resorption:

breathing difficulty

unconsciousness

headache

daze

vomiting

burns

coma

CNS disorders

cardiovascular disorders

cramps

- **Danger:**

blockade of cellular respiration

Danger of disturbed cardiac rhythm.

Danger of gastric perforation.

- **Indication of any immediate medical attention and special treatment needed:**

If blue colouring appears (lips, ear-lobes, finger-nails), give oxygen treatment as quickly as possible.

antidotes: sodium thiosulfate, dimethylaminophenol

5 Fire-fighting measures

- **Extinguishing media**

- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.

- **For safety reasons unsuitable extinguishing agents:**

Carbon dioxide

Water

- **Special hazards arising from the substance or mixture**

Formation of toxic gases is possible during heating or in case of fire.

Hydrogen

cyanide compounds, sodium monoxide

Hydrogen cyanide (HCN)

- **Advice for firefighters**

- **Protective equipment:**

Wear self-contained respiratory protective device.

Wear fully protective suit.

- **Additional information**

Collect contaminated fire fighting water separately. It must not enter the sewage system.

Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

Ambient fire may liberate hazardous vapours.

* 6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.

Mount respiratory protective device.

Use respiratory protective device against the effects of fumes/dust/aerosol.

- **Environmental precautions:**

Do not allow product to reach sewage system or any water course.

Inform respective authorities in case of seepage into water course or sewage system.

- **Methods and material for containment and cleaning up:**

Dispose contaminated material as waste according to item 13.

Ensure adequate ventilation.

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Absorb with liquid-binding material (sand, diatomite, universal binders).

- **Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

7 Handling and storage

- **Precautions for safe handling**

Keep receptacles tightly sealed.

Open and handle receptacle with care.

Work only in fume cabinet.

Ensure good ventilation/exhaustion at the workplace.

- **Information about protection against explosions and fires:**

Keep respiratory protective device available.

The product is not flammable.

- **Conditions for safe storage, including any incompatibilities**

- **Storage:**

- **Requirements to be met by storerooms and receptacles:**

Do not use light alloy receptacles.

Unsuitable material for receptacle: aluminium

Store in a cool location.

- **Information about storage in one common storage facility:** Do not store together with acids.

- **Further information about storage conditions:**

Keep receptacle tightly sealed.

Protect from heat and direct sunlight.

Protect from humidity and water.

Protect from exposure to the light.

Store under lock and key and with access restricted to technical experts or their assistants only.

- **Recommended storage temperature:** 20 °C +/- 3° (approx. 68°F)

- **Storage class:** 6.1 B

- **Specific end use(s)** No further relevant information available.

* 8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.

- **Control parameters**

- **Components with limit values that require monitoring at the workplace:**

143-33-9 sodium cyanide (5-10%)

PEL (USA)	Long-term value: 5 mg/m ³ as CN; Skin
REL (USA)	Ceiling limit value: 5* mg/m ³ , 4.7* ppm as CN; *10-min
TLV (USA)	Ceiling limit value: 5 mg/m ³ , 4.7 ppm as CN; Skin
EL (Canada)	Short-term value: C5 mg/m ³ as CN; Skin
EV (Canada)	Skin

1310-73-2 sodium hydroxide (2.5-5%)

PEL (USA)	Long-term value: 2 mg/m ³
REL (USA)	Ceiling limit value: 2 mg/m ³
TLV (USA)	Ceiling limit value: 2 mg/m ³
EL (Canada)	Short-term value: C 2 mg/m ³

- **Additional information:** The lists that were valid during the creation were used as basis.

- **Exposure controls**

- **Personal protective equipment:**

- **General protective and hygienic measures:**

Avoid contact with the eyes and skin.

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Do not eat, drink, smoke or sniff while working.
Wash hands before breaks and at the end of work.

- **Breathing equipment:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

Use respiratory protective device against the effects of fumes/dust/aerosol.

- **Recommended filter device for short term use:** Combination filter B-P3

- **Protection of hands:**

Alkaline resistant gloves

Preventive skin protection by use of skin-protecting agents is recommended.

After use of gloves apply skin-cleaning agents and skin cosmetics.

- **Material of gloves**

Nitrile rubber, NBR

Recommended thickness of the material: ≥ 0.35 mm

- **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

Value for the permeation: Level ≤ 1 (10 min)

- **Eye protection:** Tightly sealed goggles

- **Body protection:** Alkaline resistant protective clothing

9 Physical and chemical properties

- **Information on basic physical and chemical properties**

Odor Threshold: Not applicable.

- **Appearance:**

Form: Fluid

Color: Colorless

• **Odor:** Odorless

• **pH-value at 20 °C (68 °F):** 13.7

• **Melting point/Melting range:** Undetermined.

• **Boiling point/Boiling range:** 100 °C (212 °F)

• **Freezing Point:** Not applicable.

• **Flash point:** Not applicable.

• **Ignition temperature:** Undetermined.

• **Auto igniting:** Product is not selfigniting.

• **Danger of explosion:** Product does not present an explosion hazard.

• **Specific Gravity:** Not applicable.

• **Density at 20 °C (68 °F):** 1.043 g/cm³ (8.704 lbs/gal)

• **Vapour density** Not determined.

• **Evaporation rate** Not determined.

- **Solubility in / Miscibility with**

Water: Fully miscible.

• **Coefficient of Water / Oil Distribution:** Not applicable.

- **Solvent content:**

Organic solvents: 0.0 %

Water: > 90 %

Solids content: < 10 %

• **Other information** No further relevant information available.

*10 Stability and reactivity

- **Reactivity**

• **Thermal decomposition / conditions to be avoided:** To avoid thermal decomposition do not overheat.

- **Possibility of hazardous reactions**

Corrosive action on metals.

Corrodes aluminium and zinc.

Reacts with metals forming hydrogen (Danger of explosion!)

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- Reacts with acids releasing Hydrogen cyanide (prussic acid).
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:**
 - organic substances
 - acids
 - metals
 - aluminum
 - zinc
 - NH_x
- **Hazardous decomposition products:**
 - Hydrogen cyanide (prussic acid)
 - see chapter 5

* 11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**

- **LD/LC50 values that are relevant for classification:**

Oral	ATE _(MIX)	115 mg/kg (rat)
Dermal	ATE _(MIX)	140 mg/kg (rat)
Inhalative	ATE _(MIX)	0.91 mg/l/4h (ATE 0.05) (rat)

143-33-9 sodium cyanide

Oral	LD50	6.4 mg/kg (rat) (GESTIS)
	LDLo	500 mg/kg (rabbit)
	LD ₀₁	2.8 mg/kg (human)
Dermal	LD50	7.7 mg/kg (rabbit) (IUCLID)
	LC50	0.05 mg/l/4h (ATE)

1310-73-2 sodium hydroxide

Oral	LD50	325 mg/kg (rat)
	LDLo	500 mg/kg (rabbit) (IUCLID)

- **Primary irritant effect:**
- **on the skin:** Caustic effect on skin and mucous membranes.
- **on the eye:** strong caustic effect
- **Sensitization:** No sensitizing effects known.
- **Subacute to chronic toxicity:** chronic: dermatitis
- **Additional toxicological information:**
 - Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.
 - The following complies to cyanogen compounds / nitriles in general:
 - Utmost caution! Release of hydrocyanic acid is possible - blockade of cellular respiration.

- **Carcinogenic categories**

- **IARC (International Agency for Research on Cancer)**

None of the ingredients is listed.

- **NTP (National Toxicology Program)**

None of the ingredients is listed.

- **Carcinogenicity:** NTP? IARC Monographs? OSHA Regulated? see chapter 8 / 15
- **Teratogenicity:** Not found.
- **Mutagenicity:** Not found.
- **Reproductive Toxicity:** Not found.
- **Synergistic Products:** None
- **CMR effects (carcinogenity, mutagenicity and toxicity for reproduction):** no further data available

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*12 Ecological information

- **Toxicity**

- **Aquatic toxicity:**

143-33-9 sodium cyanide

LC50	0.083 mg/l/96h (Lepomis macrochirus) (IUCLID)
	0.057 mg/l/96h (Oncorhynchus mykiss) (IUCLID)
	0.12 mg/l/96h (Pimephales promelas)
NOEC	0.011 mg/l/96h (fish)

1310-73-2 sodium hydroxide

Daphnia EC50	76 mg/l/24h (Daphnia magna) (50% - MERCK)
LC50	80 mg/l/96h (Gambusia affinis) (ECOTOX database)
	99 mg/l/48h (Lepomis macrochirus) (IUCLID)

- **Persistence and degradability** No further relevant information available.

- **Other information:**

The following statements refer to the individual components.

Quantitative data on the ecological effect of this preparation are not available.

CAS - Nr. 143-33-9: > 99% / 7 d

- **Bioaccumulative potential** No further relevant information available.

- **Behavior in environmental systems:**

143-33-9 sodium cyanide

log P(o/w)	0.44 (.)
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- **Mobility in soil** No further relevant information available.

- **Ecotoxicological effects:**

- **Remark:**

Forms corrosive mixtures with water even if diluted.

Very toxic for fish

High aquatic toxicity.

- **Additional ecological information:**

- **CSB-value:**

143-33-9 sodium cyanide

COD	0.816 g/g (.)
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- **General notes:**

Water danger class 3 (Self-assessment): extremely hazardous for water

Do not allow product to reach ground water, water course or sewage system, even in small quantities.

Danger to drinking water if even extremely small quantities leak into the ground.

The product contains materials that are harmful to the environment.

- **Results of PBT and vPvB assessment** no further data available

- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**

- **Recommendation:**

Hand over to hazardous waste disposers.

Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

- **Uncleaned packagings:**

- **Recommendation:** Disposal must be made according to official regulations.

- **Recommended cleansing agent:** Water, if necessary with cleansing agents.

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*14 Transport information

<ul style="list-style-type: none"> · UN-Number · DOT, ADR, IMDG, IATA 	UN2922
<ul style="list-style-type: none"> · UN proper shipping name · DOT / TDG · ADR · IMDG · IATA 	Corrosive liquids, toxic, n.o.s. (Sodium hydroxide, Sodium cyanide) 2922 Corrosive liquids, toxic, n.o.s. (Sodium hydroxide, Sodium cyanide), ENVIRONMENTALLY HAZARDOUS CORROSIVE LIQUID, TOXIC, N.O.S. (SODIUM HYDROXIDE, SODIUM CYANIDE), MARINE POLLUTANT CORROSIVE LIQUID, TOXIC, N.O.S. (SODIUM HYDROXIDE, SODIUM CYANIDE)
<ul style="list-style-type: none"> · Transport hazard class(es) · DOT / TDG 	<div style="display: flex; align-items: center; gap: 10px;">   </div>
<ul style="list-style-type: none"> · Class · Label 	8 Corrosive substances. 8+6.1
<ul style="list-style-type: none"> · ADR 	<div style="display: flex; align-items: center; gap: 10px;">    </div>
<ul style="list-style-type: none"> · Class · Label 	8 (CT1) Corrosive substances 8+6.1
<ul style="list-style-type: none"> · IMDG 	<div style="display: flex; align-items: center; gap: 10px;">    </div>
<ul style="list-style-type: none"> · Class · Label 	8 Corrosive substances. 8+6.1
<ul style="list-style-type: none"> · IATA 	<div style="display: flex; align-items: center; gap: 10px;">   </div>
<ul style="list-style-type: none"> · Class · Label 	8 Corrosive substances. 8+6.1
<ul style="list-style-type: none"> · Packing group · DOT, ADR, IMDG, IATA 	II
<ul style="list-style-type: none"> · Environmental hazards: · Marine pollutant: · Special marking (ADR): 	Product contains environmentally hazardous substances: sodium cyanide Yes Symbol (fish and tree) Symbol (fish and tree)
<ul style="list-style-type: none"> · Special precautions for user · Danger code (Kemler): · EMS Number: · Segregation groups 	Warning: Corrosive substances 86 F-A,S-B Alkalis, cyanides
<ul style="list-style-type: none"> · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code 	Not applicable.

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<ul style="list-style-type: none"> · Transport/Additional information:
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<ul style="list-style-type: none"> · ADR
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<ul style="list-style-type: none"> · Limited quantity (LQ): 1L

*15 Regulatory information

- Safety, health and environmental regulations/legislation specific for the substance or mixture
- Sara

<ul style="list-style-type: none"> · Section 355 (Extremely hazardous substances):
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143-33-9 sodium cyanide

<ul style="list-style-type: none"> · Section 313 (Specific toxic chemical listings):
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143-33-9 sodium cyanide

<ul style="list-style-type: none"> · TSCA (Toxic Substances Control Act):

All ingredients are listed.

<ul style="list-style-type: none"> · Proposition 65

<ul style="list-style-type: none"> · Chemicals known to cause cancer:

None of the ingredients is listed.

<ul style="list-style-type: none"> · Chemicals known to cause reproductive toxicity for females:
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None of the ingredients is listed.

<ul style="list-style-type: none"> · Chemicals known to cause reproductive toxicity for males:
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143-33-9 sodium cyanide

<ul style="list-style-type: none"> · Chemicals known to cause developmental toxicity:

None of the ingredients is listed.

<ul style="list-style-type: none"> · Canadian Ingredient Disclosure List
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<ul style="list-style-type: none"> · Limit 0,1%

None of the ingredients is listed.

<ul style="list-style-type: none"> · Limit 1%

1310-73-2 sodium hydroxide

<ul style="list-style-type: none"> · Canadian Domestic Substances List (DSL)
--

All ingredients are listed.

<ul style="list-style-type: none"> · Canadian Non-domestic Substance List

None of the ingredients is listed.

<ul style="list-style-type: none"> · EPA (Environmental Protection Agency)
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143-33-9 sodium cyanide	II
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<ul style="list-style-type: none"> · NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

<ul style="list-style-type: none"> · OSHA-Ca (Occupational Safety & Health Administration)
--

None of the ingredients is listed.

<ul style="list-style-type: none"> · Australian Inventory of Chemical Substances
--

All ingredients are listed.

<ul style="list-style-type: none"> · European EINECS
--

All ingredients are listed.

<ul style="list-style-type: none"> · Standard for the Uniform Scheduling of Drugs and Poisons

1310-73-2 sodium hydroxide	S5+APPENDIX C, S6+APPENDIX C
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<ul style="list-style-type: none"> · Information about limitation of use:

Employment restrictions concerning pregnant and lactating women must be observed.
Employment restrictions concerning young persons must be observed.

- This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all of the information required by the CPR

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- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.
-

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Relevant phrases**

H290 May be corrosive to metals.
 H300 Fatal if swallowed.
 H310 Fatal in contact with skin.
 H314 Causes severe skin burns and eye damage.
 H330 Fatal if inhaled.
 H400 Very toxic to aquatic life.
 H410 Very toxic to aquatic life with long lasting effects.

R26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.

R32 Contact with acids liberates very toxic gas.

R35 Causes severe burns.

R50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

- **Recommended restriction of use:** professional/industrial use only

- **Date of preparation / last revision** 04/10/2014 / 35

- **Abbreviations and acronyms:**

EC50: effective concentration, 50 percent (in vivo)

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

DOT: US Department of Transportation

NFPA: National Fire Protection Association (USA)

WHMIS: Workplace Hazardous Materials Information System (Canada)

- **Sources**

Data arise from manufacturers' data sheets, reference works and literature.

IUCLID (International Uniform Chemical Information Database)

International Chemical Safety Cards (ICSCs)

GESTIS-Stoffdatenbank

- *** Data compared to the previous version altered.**
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