Version No: **1** Issue date: **30/APR/2024** Revision date: **Not Applicable**

Safety Data Sheet (Conforms to Annex II of REACH (1907/2006) - Regulation 2020/878)

SECTION 1. Identification of the substance / mixture and of the company / undertaking

1.1. Product Identifier

Product name	TR Binding
Synonyms	Not Available
Other means of identification	Not Available

1.2. Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Laboratory use.
Uses advised against	Not Applicable

1.3. Details of the manufacturer or supplier of the safety data sheet

Registered company name	**CleanNA**
Address	Coenecoop 75, 2741 PH, Waddinxveen, The Netherlands
Telephone	+31 (0) 182 22 33 50
Fax	+31 (0) 182 22 33 98
Website	www.cleanna.com
Email	info@cleanna.com

1.4. Emergency telephone number

Emergency telephone numbers	112 (European emergency number)

SECTION 2. Hazards identification

2.1. Classification of the substance or mixture

Classification according to regulation (EC) No 1272/2008 [CLP] and amendments	H302 - Acute Toxicity (Oral) - Category 4, H312 – Acute Toxicity (Dermal) – category 4 H318 - Serious Eye damage/Eye irritation - Category 1 H412 - Hazardous to the Aquatic Environment Long-Term Hazard – Category 3

2.2. Label elements

Hazard pictogram(s)	
Signal word	**Danger**

Hazard statement(s)

H302	Harmful if swallowed.
H312	Harmful in contact with skin.
H318	Causes serious eye damage
H332	Harmful if inhaled
H412	Toxic to aquatic life with long lasting effects

Supplementary statement(s)

EUH032	Contact with acids liberates very toxic gas

Precautionary statement(s) Prevention

P261	Avoid breathing mist / vapours / spray
P264	Wash all exposed external body areas thoroughly after handling.
P270	Do not eat, drink or smoke when using this product.
P271	Use only outdoors or in well ventilated area
P273	Avoid release to the environment
P280	Wear protective gloves, protective clothing, eye protection and face protection.

Precautionary statement(s) Response

P310	Immediately call a POISON CENTRE / doctor / physician / first aider
P330	Rinse mouth.
P301 + P312	IF SWALLOWED: Call a POISON CENTER/doctor/physician/first aider if you feel unwell.
P302 + P352	IF ON SKIN: Wash with plenty of water and soap.
P304 + P340	IF INHALED: remove person to fresh air and kepe comfortable for breathing
P362 + P364	Take off contaminated clothing and wash it before reuse.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

P501	Dispose of contents/container to authorised hazardous or special waste collection point in accordance with any local regulation.

2.3. Other hazards

Cumulative effects may results following exposure *.
May produce discomfort of the respiratory system and skin *.
Eye contact may produce serious damage *
May possibly affect fertility *.
May possibly be harmful to the foetus / embryo *.

REACH – Art 57-59: The mixture does not contain Substances of Very High Concern (SVHC) ats the SDS print date

SECTION 3. Composition / information on ingredients

3.1 Substances

See 'Composition on ingredients' in Section 3.2

3.2 Mixtures

1. **CAS No** 2. **EC No** 3. **Index No** 4. **REACH No**	**%[weight]**	**Name**	**Classification according to regulation (EC) No 1272/2008 [CLP] and amendments**	**SCL / M-Factor**	**Nanoform Particle Characteristics**
1. 593-84-0 2. 209-812-1 3. 615-004-00-3 4. Not Available	50 - 100	quanidine thiocyanate	Acute Toxicity (Oral) - Category 4, Acute Toxicity (Dermal) – Category 4 Acute Toxicity (Inhalation) – Category 4 Hazardous to the Aquatic Environment Long-Term Hazard – Category 3 H302, H312, H332, H412 [2]	Not Available	Not Available
1. Not Available 2. Not Available 3. Not Available 4. Not Available	5 - 10	Non-ionic detergent	Skin Corrosion/Irritation – Category 2 Serious Eye Damage / Eye Irritation – Category 1 Hazardous to the Aquatic Environment Long-Term Hazard – Category 2 H315, H318, H411, EUH205	Not Available	Not Available
Legend:	*2. Classification drawn from Regulation (EU) No 1272/2008 - Annex VI; 3. Classification drawn from C&L; * EU IOELVs available; [e] Substance identified as having endocrine disrupting properties*				

SECTION 4. First aid measures

4.1. Description of first aid measures

Eye Contact	If this product comes in contact with the eyes: - Immediately hold eyelids apart and flush the eye continuously with running water. - Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. - Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes. - Transport to hospital or doctor without delay. - Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin contact occurs: - Immediately remove all contaminated clothing, including footwear. - Flush skin and hair with running water (and soap of available) - Seek medical attention in event of irritation.
Inhalation	- If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. - Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. - Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. - Transport to hospital, or doctor, without delay.

Ingestion	- IF SWALLOWED REFER FOR MEDICAL ATTENTION WITHOUT DELAY, WHERE POSSIBLE - For advice contact a Poisons Information Centre or a doctor - Urgent hospital treatment is likely to be needed - In the mean time qualified first0air personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition - If the services of a medica officer / doctor are readily available; the patient should be placed in his/her care and a copy of this SDS should be provided. Further action will be the responsibility of the medical specialist. - If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of this SDS. Where medical attention is not immediately avaliable or where the patient is more than 15 minutes away from a hospital or unless instructed otherwise: - **INDUCE** vomitting with fingers down the back of the throat (**ONLY IF CONSIOUS**). Lean patient forward or place on left side, head down position (if possible) to maintain open airway and prevent aspiration **NOTE** wear a protective glove whe inducing vomiting by mechanical means

4.2 Most important symptoms and effects, both acute and delayed

See Section 11

4.3. Indication of any immediate medical attention and special treatment needed

For thiocyanate poisonings haemodialysis is recommended as the treatment of choice. Phenobarbital protects poisoned animals against death. Thiocyanate ion is slowly excreted in the urine and is not decomposed to any appreciable degree to cyanide.
[GOSSELIN, SMITH & HODGE: Clinical Toxicology of Commercial Products 5th Edition]

SECTION 5. Firefighting measures

5.1 Extinguishing media

- Foam
- Dry chemical powder
- BCF (when regulations permit)
- Carbon dioxide
- Water spray or fog – Large fires only

5.2 Special hazards arising from the substrate or mixture

Fire Incompatibility	Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

5.3. Advice for firefighters

Fire Fighting	- Alert Fire Brigade and tell them location and nature of hazard. - Wear full body protective clothing with breathing apparatus. - Prevent, by any means available, spillage from entering drains or water course. - Use water delivered as a fine spray to control fire and cool adjacent area. - Avoid spraying water onto liquid pools. - **DO NOT** approach containers suspected to be hot - Cool fire exposed containers with water spray from a protected location. - If safe to do so, remove containers from path of fire.
Fire/Explosion Hazard	- Combustible. - Slight fire hazard when exposed to heat or flame. - Heating may cause expansion or decomposition leading to violent rupture of containers. - On combustion, may emit toxic fumes of carbon monoxide (CO). - May emit acrid smoke. - Mists containing combustible materials may be explosive. Combustion products include: carbon dioxide (CO2) hydrogen chloride phosgene nitrogen oxides (NOx) sulfur oxides (SOx) other pyrolysis products typical of burning organic material. May emit poisonous fumes. May emit corrosive fumes.

SECTION 6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

See section 8

6.2 Environmental precautions

See section 12

6.3 Methods and material for containment and cleaning up

Minor Spills	Environmental hazard – contain spillage - Remove all ignition sources. - Clean up all spills immediately. - Avoid breathing vapours and contact with skin and eyes. - Control personal contact with the substance, by using protective equipment. - Contain and absorb spill with sand, earth, inert material or vermiculite. - Wipe up. - Place in a suitable, labelled container for waste disposal.

Major Spills	Environmental hazard – contain spillage - Clear area of personnel and move upwind. - Alert Fire Brigade and tell them location and nature of hazard. - Wear full body protective clothing with breathing apparatus. - Prevent, by any means available, spillage from entering drains or water course. - Consider evacuation (or protect in place) - No smoking, naked lights or ignition sources. - Increase ventilation. - Stop leak if safe to do so. - Water spray or fog may be used to disperse / absorb vapour - Contain or absorb spill with sand, earth or vermiculite. - Collect recoverable product into labelled containers for recycling. - Collect solid residues and seal in labelled drums for disposal. - Wash area and prevent runoff into drains. - After cleanup operations, decontaminate and launder all protective clothing and equipment before storing and re-using - If contamination of drains or waterways occurs, advise emergency services.

6.4. Reference to other sections

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

SECTION 7. Handling and storage

7.1. Precautions for safe handling

Safe handling	- Avoid all personal contact, including inhalation. - Wear protective clothing when risk of exposure occurs. - Use in a well-ventilated area. - Prevent concentration in hollows and sumps. - **DO NOT** enter confined spaces until atmosphere has been checked. - Avoid smoking, naked lights or ignition sources. - Avoid contact with incompatible materials. - When handling, **DO NOT** eat, drink or smoke. - Keep containers securely sealed when not in use. - Avoid physical damage to containers. - Always wash hands with soap and water after handling. - Work clothes should be laundered separately. - Use good occupational work practice. - Observe manufacturer's storage and handling recommendations contained within this SDS. - Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions. - **DO NOT** allow clothing wet with material to stay in contact with skin
Fire and explosion protection	See section 5
Other information	- Store in original containers. - Keep containers securely sealed. - No smoking, naked lights or ignition sources. - Store in a cool, dry, well-ventilated area. - Store away from incompatible materials and foodstuff containers. - Protect containers against physical damage and check regularly for leaks. - Observe manufacturer's storage and handling recommendations contained within this SDS.

7.2. Conditions for safe storage, including any incompatibilities

Suitable container	- Metal can or drum - Packaging as recommended by manufacturer. - Check all containers are clearly labelled and free from leaks.
Storage incompatibility	- Metal cyanides are readily oxidised and those of some heavy metals show thermal instability - Metal cyanide and cyanates are often endothermic. Several numbers of this family of compounds contain heavy metals tend to explosive instability, and most are capable of violent oxidation under certain circumstances - Fusion of mixtures of metal cyanides with metal chlorates, perchlorates, nitrates or nitrites cause violent explosion - Magnesium reacts with incandescence on heating with several metal cyanides; release of cyanogen by thermal decomposition may cause vigorous reaction with magnesium - Addition of one solid component (even in residual amounts) to another molten component is extremely dangerous - Nitriles may polymerise in the presence of metals and some metal compounds - Incompatible with acids; mixing nitriles with strong oxidising acids can lead to extremely violent reactions - Nitriles are generally incompatible with other oxidising agents such as peroxides and epoxides - Combination of bases and nitriles can produce hydrogen cyanide. Nitriles are hydrolysed exothermally in both aqueous acid and base to give carboxylic acids (or salts of carboxylic acids) - Nitriles can react vigorously with reducing agents - The covalent cyano group is endothermic and many organic nitriles are reactive under certain conditions; N-cyano derivatives are reactive or unstable - The majority of endothermic compounds are thermodynamically unstable and may decompose explosively under various circumstances of initiation - Many, but not all endothermic compounds have been involved in decompositions, reactions and explosions and, in general, compounds with significantly positive values of standard heats of formation, may be considered suspect on stability grounds [BRETHERICK L: handbook of Reactive Chemical Hazards]
Hazard categories in accordance with Regulation (EC) No 1272/2008	Not Available
Qualifying quantity (tonnes) of dangerous substances as referred to in Article 3(10) for the application of	Not Available

7.3. Specific end use(s)

See section 1.2

SECTION 8. Exposure controls / personal protection

8.1. Control parameters

Ingredient	DNELs Exposure Pattern Worker			PNECs Compartment	
guanidine thiocyanate	Dermal	0.31 mg/kg bw/day	(Systemic, Chronic)	42.4 mcg/L	(Water (Fresh))
	Inhalation	1.092 mg/m^3	(Systemic, Chronic)	4.24 mcg/L	(Water – Intermittent release)
	Inhalation	3.28 kg/m^3	(Systemic, Acute)	424 mcg/L	(Water (Marine))
	Dermal	*0.155 mg/kg bw/day*	*(Systemic, Chronic) **	165 mcg/kg sediment dw	(Sediment (Fresh Water))
	Inhalation	*0.27 mg/m^3*	*(Systemic, Chronic) **	16.5 mcg/kg sediment dw	(Sediment (Marine))
	Oral	*0.155 mg/kg bw/day*	*(Systemic, Chronic) **	8.03 mcg/kg soil dw	(Soil)
				20 mg/L	(STP)

* Values for General Population

Occupational Exposure Limits (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available

Emergency Limits

Ingredient	TEEL-1	TEEL-2	TEEL-3
guanidine thiocyanate	0.98 mg/m^3	11 mg/m^3	65 mg/m^3

Ingredient	Original IDLH	Revised IDLH
guanidine thiocyanate	Not Available	Not Available

8.2. Exposure controls

8.2.1 Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

Local exhaust ventilation usually required. If risk of overexposure exists wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied air-type respirator may be required in special circumstances Correct fit is essential to ensure adequate protection
An approved self contained breathing apparatus 9SCBA) may be required in some situations.

Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying “escape” velocities which, in turn, determine the “capture velocities” of fresh circulating air required to effectively remove the contaminant

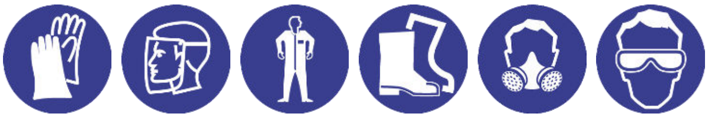
Type of contaminant	Air Speed
Solvent, vapours, degreasing etc. evaporating from tank (in still air)	0.25 – 0.5 m/s (50 – 100 f/min)
Aerosols, fumes form pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5 – 1 m/s (100 – 200 f/min)
Direct spray, spray painting in shallow boots, drum filling, conveyer loading, crusher debts, gas discharge (active generation into zone of rapid air motion)	1 – 2.5 m/s (200 – 500 f/min)
Grinding, abrasive blasting, tumbling, high speed generated dusts (released at high velocity into zone of very high rapid air motion)	w.5 – 10 m/s (500 – 200 f/min)

Within each range the appropriate value depends to:

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

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

8.2.2. Personal protection



Eye and face protection

- Safety glasses with side shields.
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of

lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly.
[CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

Skin protection

See Hand protection below

- Wear chemical protective gloves, e.g. PVC.
- Wear safety footwear or safety gumboots, e.g. Rubber

Hand / feet protection

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include:
· frequency and duration of contact,
· chemical resistance of glove material,
· glove thickness and
· dexterity
Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).
· When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
· When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
· Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use.
· Contaminated gloves should be replaced.
As defined in ASTM F-739-96 in any application, gloves are rated as:
· Excellent when breakthrough time > 480 min
· Good when breakthrough time > 20 min
· Fair when breakthrough time < 20 min
· Poor when glove material degrades
For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended.
It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times.
Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers technical data should always be taken into account to ensure selection of the most appropriate glove for the task.
Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example:
· Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of.
· Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

Body protection

See Other protection below

Other protection

- Overalls.
- PV€ apron
- Barrier cream.
- Skin cleansing cream.
- Eye wash unit.

Respiratory protection
Type AB-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent).

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Required minimum protection factor	Maximum gas / vapour concentration present in air p.p.m. (by volume)	Half-face respirator	Full-face Respirator
Up to 10	1000	AB-AUS / Class 1 P2	-
Up to 50	1000	-	AB-AUS / Class 1 P2
Up to 50	5000	Airline *	-
Up to 100	5000	-	AB-2 P2
Up to 100	10000	-	AB-3 P2
100+			Airline *

* continuous flow ** continuous flow of positive pressure demand

A (All classes)	Organic vapours
B AUS or B1	Acid gasses
B2	Acid gas or hydrogen cyanide (HCN)
B3	Acid gas or hydrogen cyanide (HCN)
E	Sulfur dioxide (SO2)
G	Agricultural chemicals
K	Ammonia (NH3)
Hg	Mercury
NO	Oxides of Nitrogen
MB	Methyl bromide
AX	Low boil point organic compounds (< 65 degC)

- Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content
- Wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.
- Cartridge performance is affected by humidity. Cartridges should only be change dafter 2 hr of continuous use unless it is determined that the humidity is less than 76%, in which case, cartridges can be used for 4 hrs. Used cartridges should be discarded daily, regardless of the length of time used.

8.2.3. Environmental exposure controls

See section 12

SECTION 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	Not Available

Physical state	Liquid	**Relative density (Water = 1)**	Not Available
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Available	**Decomposition temperature (°C)**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	Not Available
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	Not Available	**Taste**	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Available	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water	Immiscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available
Nanoform Solubility	Not Available	**Nanoform Particle Characteristics**	Not Available
Particle Size	Not Available		

9.2. Other information

Not Available

SECTION 10. Stability and reactivity

10.1.Reactivity	See section 7.2
10.2. Chemical stability	- Unstable in the presence of incompatible materials. - Product is considered stable. - Hazardous polymerisation will not occur.
10.3. Possibility of hazardous reactions	See section 7.2
10.4. Conditions to avoid	See section 7.2
10.5. Incompatible materials	See section 7.2
10.6. Hazardous decomposition products	See section 5.3

SECTION 11. Toxicological information

11.1. Information on toxicological effects

Inhaled	Inhalation of vapours or aerosols (mists, fumes) generated by the material during the course or normal handling, may be harmful. The material is not thought to produce respiratory irritation (as classified by EC Directives using animal models). Nevertheless inhalation of vapours, fumes or aerosols, especially for prolonged periods, may produce respiratory discomfort and occasionally, distress. Hydrogen chloride (HCl) vapour or fumes present a hazard from a single acute exposure. Exposures of 1300 to 2000 ppm have been lethal to humans in a few minutes. Inhalation of HCl may cause choking, coughing, burning sensation and may cause ulceration of the nose, throat and larynx. Fluid on the lungs followed by generalised lung damage may follow. Breathing of HCl vapour may aggravate asthma and inflammatory or fibrotic pulmonary disease. High concentrations cause necrosis of the tracheal and bronchial epithelium, pulmonary oedema, atelectasis and emphysema and damage to the pulmonary blood vessels and liver.
Ingestion	Accidental ingestion of the material may be harmful. Animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual. A number of materials such as cyanamide, calcium cyanamide, cyanates, isocyanates, isonitrile, thiocyanates, ferricyanide and ferrocyanide and cyanoacetates do not exhibit the same toxic effects as cyanides and nitriles. Probable lethal dos of thiocyanate (rhodanate) in man, is between 15 and 30 gm (ingested at one time). Several acute fatalities are recorded with death

	coming in 10 to 48 hours.
Skin Contact	The material may accentuate any pre-existing dermatitis condition Non-ionic surfactants cause less irritation than other surfactants as they have less ability to denature protein in the skin. Open cuts, abraded or irritated skin should not be exposed to this material Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected. Skin contact with the material may be harmful; systemic effects may result following absorption. There is some evidence to suggest that the material may cause moderate inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterised by redness, swelling and blistering.
Eye	If applied to the eyes, this material causes severe eye damage. Non-ionic surfactants can cause numbing of the cornea, which masks discomfort normally caused by other agents and leads to corneal injury. Irritation varies depending on the duration of contact, the nature and concentration of the surfactant.
Chronic	Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models). Nevertheless exposure by all routes should be minimised as a matter of course. Chronic minor exposure to hydrogen chloride (HCl) vapour or fume may cause discolouration or erosion of the teeth, bleeding of the nose and gums; and ulceration of the mucous membranes of the nose. Workers exposed to hydrochloric acid suffered from stomach inflammation and a number of cases of chronic bronchitis (airway inflammation) have also been reported. Repeated or prolonged exposure to dilute solutions of hydrogen chloride may cause skin inflammation.

	TOXICITY	IRRITATION
TR Binding	Not Available	Not Available
Guanidine thiocyanate	Dermal (rabbit) LD50: > 2000 mg/kg [2]	Skin: adverse effect observed (corrosive) [1]
	Inhalation(Rat) LC50: > 0.853 mg/l4h [1]	
	Oral (Rat) LD50: 474.6 mg/kg [2]	

Legend: *1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

TR Binding

Goitrogenic:
Goitrogens are substances that suppress the function of the thyroid gland by interfering with iodine uptake, which can, as a result, cause an enlargement of the thyroid (a goitre).

Goitrogens include:
- Vitexin, a flavonoid, which inhibits thyroid peroxidase, contributing to goitre
- Thiocyanate and perchlorate, which decrease iodide uptake by competitive inhibition and consequently increase release of TSH from the pituitary gland
- Lithium, which inhibits thyroid hormone release
- Certain foods, such as soy and millet (containing vitexins) and vegetables in the genus Brassica (which includes broccoli, Brussels sprouts, cabbage, cauliflower and horseradish).
- Caffeine (found in coffee, tea, cola and chocolate), which acts on thyroid function as a suppressant.

Thiocyanate is known to be an important part in the biosynthesis of hypothiocyanite by a lactoperoxidase. Thus the complete absence of thiocyanate or reduced thiocyanate in the human body, (e.g., cystic fibrosis) is damaging to the human host defense system Thiocyanate [SCN-] is a complex anion which is a potent inhibitor of iodide transport (the thyroid sodium-iodide symporter)Iodine is an essential component of thyroxine. Since thiocyanates will decrease iodide transport into the thyroid follicular cell, they will decrease the amount of thyroxine produced by the thyroid gland. As such, foodstuffs containing thiocyanate are best avoided by Iodide deficient hypothyroid patients Thiocyanate is the detoxification product of cyanide and can easily be measured in body fluids.

Consumption of naturally occurring goitrogens, certain environmental toxins and cigarette smoke can significantly increase SCN- concentrations to levels potentially capable of affecting the thyroid gland. Goiter endemics were reported to develop when the critical urinary iodine/ SCN- ratio decreases below 3 microgram iodine per mg SCN-. Iodine supplementation completely reverses the goitrogenic influence of SCN-. SCN- is also generated from cigarette smoking as a detoxifying product of cyanide. During the past two decades many reports dealt with the possible effects of cigarette smoking on thyroid hormone synthesis, thyroid gland size and thyroid autoimmunity including infiltrative ophtalmopathy of Graves' disease.

Thiocyanates are derived from the hydrolysis of glucosinolates — sulfur-containing compounds found in cruciferous vegetables. Brassica species such as cabbage, broccoli, cauliflower, rutabaga, mustard, Brussels sprouts, and turnip contain glucosinolates (previously called thioglucosides) which are hydrolyzed to form isothiocyanates, nitriles, and thiocyanates

Guanidine thiocyanate

The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may produce respiratory tract irritation, and result in damage to the lung including reduced lung function.

Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.

The material may produce respiratory tract irritation and result in damage to the lung including reduced lung function. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

Acute Toxicity	✓	**Carcinogenicity**	✗
Skin Irritation/Corrosion	✗	**Reproductivity**	✗
Serious Eye Damage/Irritation	✓	**STOT - Single Exposure**	✗
Respiratory or Skin sensitisation	✗	**STOT - Repeated Exposure**	✗
Mutagenicity	✗	**Aspiration Hazard**	✗

Legend: ✗ *– Data either not available or does not fill the criteria for classification*
✓ *– Data available to make classification*

11.2. Information on other hazards

1. Endocrine Disruption Properties

Not Available

2. Other Information

See Section 11.1

SECTION 12. Ecological information

12.1 Toxicity

	Endpoint	Test duration (hr)	Species	Value	Source
TR Binding	Not available	Not available	Not available	*Not available*	*Not available*
Guanidine hydrochloride	**Endpoint**	**Test duration (hr)**	**Species**	**Value**	**Source**
	NOEC(ECx)	504	Crustacea	1.25 mg/l	2
	EC50	72	Algae or other aquatic plants	130 mg/l	2
	LC50	96	Fish	~ 89.1 mg/l	2
	EC50	48	Crustacea	42.4 mg/l	2
Legend:	*Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*				

Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Do **NOT** allow product to come in contact with surface waters or to intertidal areas below the mean high water mark.
Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

For Thiocyanates:
Terrestrial Fate:
- Soil - At near ambient temperatures (approximately 30 C.) it appears that sorption and volatilization are not significant processes for thiocyanate in soil, with thiocyanate losses due primarily to microbial degradation.
- Thiocyanate is not persistent in soils.
- Thiocyanate may undergo both aerobic and anaerobic microbial degradation; however, the degradation pathway has not been defined.
- Saturated soils treated with thiocyanate were found to emit carbonyl sulfide (COS).
- Microbial degradation is the primary mechanism for thiocyanate disappearance at or below 30 C., with carbonyl sulfide as a possible hydrolysis product.
- Loss of thiocyanate at higher temperatures (50-60 C.) did not appear to result from microbial degradation.

Aquatic Fate:
- Biodegradation is a significant transformation process for thiocyanates in natural waters.
- Thiocyanate is toxic to microorganisms at high concentrations; however, acclimated cultures have increased tolerance to this compound.
- At concentrations up to 1.42 g/L., thiocyanate is completely degraded within 4 days to ammonia and sulfate ion (SO4-2) by an acclimatized co-culture of two bacteria (Acinetobacter johnsonii and Pseudomonas diminuta).

For Alkylphenols and their Ethoxylates, or Propoxylates (APE):
Environmental fate:
- Alkylphenols are found everywhere in the environmental, when released.
- Releases are generally as wastes; they are extensively used throughout industry and in the home.
- Alkylphenol ethoxylates are widely used surfactants in domestic and industrial products, which are commonly found in wastewater discharges and in sewage treatment plant effluents. These substances can load considerably in various environmental compartments.

Atmospheric Fate:
- Alkylphenols released to the atmosphere will exist in the vapor phase and are thought to be degraded by reaction with hydroxyl radicals, with a calculated half-life, for nonylphenol, of 0.3 days. However, emissions to the air will be limited.

Terrestrial Fate:
- These substances will adsorb to organic soil substances.
- Adsorption decreases as certain chains in the chemical get longer and increases if water is present.

Aquatic Fate:
- These substances will partition to the sediment if they are released to water.
- These substances are expected to undergo primary breakdown in oxygenated river water at a relatively fast rate.
- Nonylphenols are susceptible to breakdown by sunlight in water.
- Light breakdown of with ethoxylated nonylphenol in water is much slower and is not expected to be an important fate process.
- The non-biological breakdown of these substances is negligible and biological breakdown of these substances does not readily take place.
- The half-life in surface water may be around 30 days.

Ecotoxicology:
- There is concern that APE metabolites, (NP, OP, NPE1-3), can mimic natural hormones and that the levels of the substances present in the environment may be sufficient to disrupt endocrine function in wildlife and humans.
- Organisms in different levels of the food chain may experience different responses to the natural hormone mimics found in these substances.
- These substances are not expected to be toxic to Daphnia magna water fleas; however, negative impacts on male fathead minnow reproduction have been noted.
- These substances may have a profound negative affect on reproduction in adult fishes.
- Alkylphenols are not readily biodegradable.
- The full breakdown pathway for APES has not yet been determined.

Biodegradation of APEs produces less biodegradable products: alkylphenol mono- and di-ethoxylates, alkylphenoxy acetic/alkylphenoxypolyethoxy acetic acids, and alkylphenols. These metabolites frequently persist through sewage treatment and in rivers. Alkylphenols will accumulate in low oxygen conditions. Metabolites of APES accumulate in organisms and are more toxic than the original compound. Estrogen mimicking effects have been seen in rainbow trout, mice, and chicken embryos. The insecticide chlordecone, (Kepone), shows similar behavior to alkylphenols, accumulating in liver and fat tissue, and eliciting estrogen mimicking activity. Green algae are the most sensitive species

DO NOT discharge into sewer or waterways.

12.2. Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
	No data avialable	No data avialable

12.3. Bio accumulative potential

Ingredient	Bioaccumulation
	No data avialable

12.4. Mobility in soil

Ingredient	Mobility
	No data avialable

12.5. Results of PBT and vPvB assessment

	P	B	T
Relevant available data	Not Available	Not Available	Not Available
PBT	✗	✗	✗
vPvB	✗	✗	✗

PBT Criteria fulfilled?	No
vPvB	No

12.6. Endocrine Disruption Properties

Not Available

12.7. Other adverse effects

Not Available

SECTION 13. Disposal considerations

13.1. Waste treatment methods

Product / Packaging disposal	- Containers may still present a chemical hazard/ danger when empty. - Return to supplier for reuse/ recycling if possible. Otherwise: - If container cannot be cleaned sufficiently well to ensure that residuals do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorized landfill. - Where possible retain label warnings and SDS and observe all notices pertaining to the product. Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: - Reduction - Reuse - Recycling - Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. - **DO NOT** allow wash water from cleaning or process equipment to enter drains. - It may be necessary to collect all wash water for treatment before disposal. - In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. - Where in doubt contact the responsible authority. - Recycle wherever possible or consult manufacturer for recycling options - Consult manufacturer for recycling options or consult local or regional waste management authority for disposal if no suitable treatment or disposal facility can be identified. - Dispose of by: burial in a land-fill specifically licensed to accept chemical and / or pharmaceutical wastes or incineration in a licensed apparatus (after admixture with suitable combustible material).
Waste treatment options	Not Available
Sewage disposal options	Not Available

SECTION 14 Transport information

Labels Required

Marine Pollutant	No

Land transport (ADR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. **UN number**	Not Applicable	
14.2. **UN proper shipping name**	Not Applicable	
14.3. **Transport hazard class(es)**	Class	Not Applicable
	Sub risk	Not Applicable
14.4. **Packing group**	Not Applicable	
14.5. **Environmental hazard**	Not Applicable	
14.6. **Special precautions for user**	Hazard identification (Kemler)	Not Applicable
	Classification code	Not Applicable
	Hazard Label	Not Applicable
	Special provisions	Not Applicable
	Limited quantity	Not Applicable
	Tunnel Restriction Code	Not Applicable

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. **UN number**	Not Applicable	
14.2. **UN proper shipping name**	Not Applicable	
14.3. **Transport hazard class(es)**	ICAO/IATA Class	Not Applicable
	ICAO / IATA Sub risk	Not Applicable
	ERG Code	Not Applicable
14.4. **Packing group**	Not Applicable	
14.5. **Environmental hazard**	Not Applicable	
14.6. **Special precautions for user**	Special provisions	Not Applicable
	Cargo Only Packing Instructions	Not Applicable
	Cargo Only Maximum Qty / Pack	Not Applicable
	Passenger and Cargo Packing Instructions	Not Applicable
	Passenger and Cargo Maximum Qty / Pack	Not Applicable
	Passenger and Cargo Limited Quantity Packing Instructions	Not Applicable
	Passenger and Cargo Limited Maximum Qty / Pack	Not Applicable

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. **UN number**	Not Applicable	
14.2. **UN proper shipping name**	Not Applicable	
14.3. **Transport hazard class(es)**	IMDG Class	Not Applicable
	IMDG Sub risk	Not Applicable
14.4. **Packing group**	Not Applicable	
14.5. **Environmental hazard**	Not Applicable	
14.6. **Special precautions for user**	EMS Number	Not Applicable
	Special provisions	Not Applicable
	Limited Quantities	Not Applicable

Inland waterways transport (ADN): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. **UN number**	Not Applicable	
14.2. **UN proper shipping name**	Not Applicable	
14.3. **Transport hazard class(es)**	Not applicable	Not Applicable
14.4. **Packing group**	Not applicable	
14.5. **Environmental hazard**	Not applicable	
14.6 **Special precautions for user**	Classification code	Not Applicable
	Special provisions	Not Applicable
	Limited quantity	Not Applicable
	Equipment required	Not Applicable
	Fire cones number	Not Applicable

14.7. Transport in bulk according to Annex II of MARPOL and the IBC code

Not Applicable

14.8. Transport in bulk in accordance with MARPOL Annex V and the IMSBC Code

Product name	Group
Guanidine thiocyanate	Not Available
Non-ionic detergent	Not Available

14.9. Transport in bulk in accordance with the ICG Code

Product name	Ship Type
Guanidine thiocyanate	Not Available
Non-ionic detergent	Not Available

SECTION 15. Regulatory information

15.1. Safety, health and environmental regulations / legislation specific for the substance or mixture

Guanidine thiocyanate is found on the following regulatory lists

Europe EC Inventory

European Union – European Inventory of Existing Commercial Chemical Substances (EINICS)

European Union (EU) regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures – Annex Vi

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable - : Directives 98/24/EC, - 92/85/EEC, - 94/33/EC, - 2008/98/EC, - 2010/75/EU; Commission Regulation (EU) 2020/878; Regulation (EC) No 1272/2008 as updated through ATPs.

Information according to 2012/18/EU (Seveso III):

Seveso Category	Not available

15.2. Chemical safety assessment

No Chemical Safety Assessment has been carried out for this substance/mixture by the supplier.

ECHA SUMMARY

Ingredient	CAS number	Index No	ECHA Dossier
Guanidine thiocyanate	593-84-0	615-004-00-3	Not Available

Harmonization (C&L Inventory)	Hazard Class and Category Code(s)	Pictograms Signal Word Code(s)	Hazard Statement Code(s)
1	Acute Tox. 4; Acute Tox. 4 ; Acute Tox. 4 ; Aquatic Chronic 3	GHS07; Wng	H302; H312, H332; H412
2	Acute Tox. 4; Skin Corr. 1B; Eye Dam. 1; Aquatic Chronic 3 ;Acute Tox. 3 ; Acute Tox. 34; Aquatic Acute 3 ; STOT SE 3	GHS05; Dgr; GHS06; GHS08	H301; H312; H314; H318; H331; H335; H402; H412

Harmonization Code 1 = The most prevalent classification. Harmonization Code 2 = The most severe classification.

National Inventory Status

National Inventory	Status
Australia - AIIC / Australia Non-Industrial Use	Yes
Canada - DSL	Yes
Canada - NDSL	No (guanidine thiocyanate, Non-ionic detergent)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	No (Non-ionic detergent)
Japan - ENCS	No (guanidine thiocyanate)
Korea - KECI	No (guanidine thiocyanate)
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (guanidine thiocyanate, Non-ionic detergent)
Vietnam - NCI	Yes
Russia - FBEPH	Yes
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory. These ingredients may be exempt or will require registration.*

SECTION 16. Other information

Full text Risk and Hazard codes

H301	Toxic if swallowed
H314	Causes severe skin burns and eye damage
H331	Toxic if inhaled
H335	May cause respiratory irritation.
H402	Harmful to aquatic life

Version Summary

Version	Date of Update	Sections Updated
1	30/APR/2024	Initial version

Other information

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

For detailed advice on Personal Protective Equipment, refer to the following EU CEN Standards:
EN 166 Personal eye-protection
EN 340 Protective clothing
EN 374 Protective gloves against chemicals and micro-organisms
EN 13832 Footwear protecting against chemicals
EN 133 Respiratory protective devices

Definitions and abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
AIIC	Australian Inventory of Industrial Chemicals
BCF:	Bio Concentration Factors
BEI	Biological Exposure Index
DSL	Domestic Substances List
EINECS	European INventory of Existing Commercial chemical Substances
ELINCS	European List of Notified Chemical Substances
ENCS	Existing and New Chemical Substances Inventory
ES	Exposure Standard
FBEPH	Russian Register of Potentially Hazardous Chemical and Biological Substances
IARC	International Agency for Research on Cancer
IECSC	Inventory of Existing Chemical Substance in China
IDLH	Immediately Dangerous to Life or Health Concentrations
INSQ	Inventario Nacional de Sustancias Químicas
KECI:	Korea Existing Chemicals Inventory
LOAEL	Lowest Observed Adverse Effect Level
LOD	Limit Of Detection
NCI	National Chemical Inventory
NDSL	Non-Domestic Substances List
NLP	No-Longer Polymers
NOAEL	No Observed Adverse Effect Level
NZIoC:	New Zealand Inventory of Chemicals
OSF	Odour Safety Factor
OTV	Odour Threshold Value
PC	Permissible Concentration
PC-STEL	Permissible Concentration Short Term Exposure Limit
PICCS	Philippine Inventory of Chemicals and Chemical Substances
STEL	Short Term Exposure Limit
TCSI	Taiwan Chemical Substance Inventory
TEEL	Temporary Emergency Exposure Limit
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average

Classification and procedure used to derive the classification for mixtures according to regulation (EC) 1272/2008 (CLP)

Classification according to regulation (EC) No 1272/2008 (CLP) and amendments	Classification procedure
Acute Toxicity (Dermal) – Category 4 , H312	On basis of test data
Serious Eye damage / Eye irritation – Category 1 , H318	Calculation Method
Acute Toxicity (Inhalation) – Category 4 , H332	On basis of test data
EUH032	On basis of test data
Acute Toxicity (Oral) – category 4 , H302	On basis of test data
Hazardous to the Aquatic Environment Long-term hazard – Category 3 , H412	Calculation Method