



Kreatech FISH probe ROW

Leica Biosystems Amsterdam

Version No: 0.10

Safety Data Sheet (Conforms to Regulations (EC) No 2015/830)

Chemwatch Hazard Alert Code: 3

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S.REACH.NLD.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

1.1. Product Identifier

Product name	Kreatech FISH probe ROW
Synonyms	pKBI series
Other means of identification	Not Available

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

Relevant identified uses	Use according to manufacturer's directions.
Uses advised against	Not Applicable

1.3. Details of the supplier of the safety data sheet

Registered company name	Leica Biosystems Amsterdam
Address	Vlierweg 20 Amsterdam noord holland Netherlands
Telephone	+31-206919181
Fax	+31-206963531
Website	www.LeicaBiosystems.com
Email	kreatech-support@leicabiosystems.com

1.4. Emergency telephone number

Association / Organisation	Leica Biosystems
Emergency telephone numbers	+31-206919181
Other emergency telephone numbers	Not Available

SECTION 2 HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification according to regulation (EC) No 1272/2008 [CLP] ^[1]	Reproductive Toxicity Category 1B
Legend:	1. Classified by Chemwatch; 2. Classification drawn from EC Directive 67/548/EEC - Annex I ; 3. Classification drawn from EC Directive 1272/2008 - Annex VI

2.2. Label elements

CLP label elements	
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SIGNAL WORD **DANGER**

Hazard statement(s)

H360D	May damage the unborn child
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Precautionary statement(s) Prevention

P201	Obtain special instructions before use.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statement(s) Response

P308+P313	IF exposed or concerned: Get medical advice/attention.
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Precautionary statement(s) Storage

P405	Store locked up.
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Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.
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2.3. Other hazards

formamide	Listed in the European Chemicals Agency (ECHA) Candidate List of Substances of Very High Concern for Authorisation
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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]
1.7732-18-5* 2.231-791-2 3.Not Available 4.Not Available	20-50	<u>water</u>	Not Applicable
1.75-12-7 2.200-842-0 3.616-052-00-8 4.01-2119496064-35-XXXX, 01-2119841903-36-XXXX, 01-2119856136-36-XXXX	20-50	<u>formamide</u>	Repr. 1B; H360D *** [3]
1.9063-02-9 2.Not Available 3.Not Available 4.Not Available	5-20	<u>dextran sulfate</u>	Not Applicable
1.7647-14-5 2.231-598-3 3.Not Available 4.01-2119485491-33-XXXX	<1	<u>sodium chloride</u>	Skin Corrosion/Irritation Category 2, Eye Irritation Category 2, STOT - SE (Resp. Irr.) Category 3; H315, H319, H335 [1]
1.6132-04-3 2.200-675-3 3.Not Available 4.01-2119457027-40-XXXX	<1	<u>sodium citrate dihydrate</u>	Not Applicable

Legend: 1. Classified by Chemwatch; 2. Classification drawn from EC Directive 67/548/EEC - Annex I; 3. Classification drawn from EC Directive 1272/2008 - Annex VI 4. Classification drawn from C&L

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 FIRST AID MEASURES

4.1. Description of first aid measures

General	<ul style="list-style-type: none"> ▶ Immediately give a glass of water. ▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor. ▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area. ▶ Other measures are usually unnecessary. If this product comes in contact with eyes: <ul style="list-style-type: none"> ▶ Wash out immediately with water. ▶ If irritation continues, seek medical attention. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel. If skin or hair contact occurs: <ul style="list-style-type: none"> ▶ Flush skin and hair with running water (and soap if available). Seek medical attention in event of irritation.
Eye Contact	<p>If this product comes in contact with eyes:</p> <ul style="list-style-type: none"> ▶ Wash out immediately with water. ▶ If irritation continues, seek medical attention. ▶ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

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Skin Contact	<p>If skin or hair contact occurs:</p> <ul style="list-style-type: none"> ▶ Flush skin and hair with running water (and soap if available). ▶ Seek medical attention in event of irritation.
Inhalation	<ul style="list-style-type: none"> ▶ If fumes, aerosols or combustion products are inhaled remove from contaminated area. Other measures are usually unnecessary.
Ingestion	<ul style="list-style-type: none"> ▶ Immediately give a glass of water. ▶ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor.

4.2 Most important symptoms and effects, both acute and delayed

	See Section 11
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4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 FIREFIGHTING MEASURES

5.1. Extinguishing media

	<ul style="list-style-type: none"> ▶ Foam. ▶ Dry chemical powder. ▶ BCF (where regulations permit). ▶ Carbon dioxide. ▶ Water spray or fog - Large fires only.
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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
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5.3. Advice for firefighters

Fire Fighting	<ul style="list-style-type: none"> ▶ 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	<ul style="list-style-type: none"> ▶ 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. <p>Combustion products include: carbon dioxide (CO₂), nitrogen oxides (NO_x), other pyrolysis products typical of burning organic material May emit poisonous fumes.</p>

SECTION 6 ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

	See section 8
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6.2. Environmental precautions

	See section 12
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6.3. Methods and material for containment and cleaning up

Minor Spills	<ul style="list-style-type: none"> ▶ 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	

6.4. Reference to other sections

	Personal Protective Equipment advice is contained in Section 8 of the SDS.
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SECTION 7 HANDLING AND STORAGE

7.1. Precautions for safe handling

Safe handling	<ul style="list-style-type: none"> ▶ 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.
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	<ul style="list-style-type: none"> ‡ DO NOT allow material to contact humans, exposed food or food utensils. 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. Launder contaminated clothing before re-use. 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 are maintained.
Fire and explosion protection	See section 5
Other information	<ul style="list-style-type: none"> ‡ 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	<ul style="list-style-type: none"> ‡ DO NOT use mild steel or galvanised containers ‡ Metal can or drum ‡ Packaging as recommended by manufacturer. ‡ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	<p>Formamide:</p> <ul style="list-style-type: none"> ‡ may be light- and impact-sensitive ‡ reacts slowly with water forming hydrocyanic acid and ammonium formate - this reaction will be sped up by elevated temperatures or increase or decrease in pH ‡ reacts violently, possibly explosively, when mixed with furfuryl alcohol, hydrogen peroxide, nitromethane, phosphorus pentoxide, titanium nitrate ‡ is incompatible with strong oxidisers, acids, bases, alkali metal acetates, ammonia, cellulose acetate, cresols, iodine, isocyanates, lignin, metal chlorides, nitrates, oleum, phenols, polyvinyl alcohol, pyridines, starch, inorganic sulfates, sulfur trioxide, tannins ‡ attacks metals, including brass and copper, and their alloys, aluminium, cobalt, iron, lead, nickel, tin, zinc ‡ attacks some plastics, coatings, rubbers and glues ‡ thermal decomposition may produce ammonia, oxides of carbon and nitrogen, and hydrogen cyanide <p>‡ Avoid reaction with oxidising agents</p>

7.3. Specific end use(s)

See section 1.2

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

DERIVED NO EFFECT LEVEL (DNEL)

Not Available

PREDICTED NO EFFECT LEVEL (PNEC)

Not Available

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Not Available						

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
formamide	Formamide	13 ppm	13 ppm	600 ppm
sodium chloride	Chloride; (Chloride(1-); Chloride ions)	1 ppm	2.52 ppm	30 ppm
sodium chloride	Sodium chloride	11 mg/m3	120 mg/m3	1100 mg/m3
sodium citrate dihydrate	Citric acid, trisodium salt, dihydrate	9.3 mg/m3	100 mg/m3	610 mg/m3
sodium citrate dihydrate	Trisodium citrate	9.3 mg/m3	100 mg/m3	610 mg/m3

Ingredient	Original IDLH	Revised IDLH
water	Not Available	Not Available
formamide	Not Available	Not Available
dextran sulfate	Not Available	Not Available
sodium chloride	Not Available	Not Available
sodium citrate dihydrate	Not Available	Not Available

8.2. Exposure controls

8.2.1. Appropriate engineering controls	<p>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:</p>
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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.

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. 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 from 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 booths, drum filling, conveyer loading, crusher dusts, 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 wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or 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
- ▶ 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

Hands/feet protection

Not Applicable

Body protection

See Other protection below

Other protection

Not Applicable

Thermal hazards

Not Available

Respiratory protection

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

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	Not Available

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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 (g/L)	Immiscible	pH as a solution (1%)	Not Available
Vapour density (Air = 1)	Not Available	VOC g/L	Not Available

9.2. Other information

	Not Available
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SECTION 10 STABILITY AND REACTIVITY

10.1.Reactivity	See section 7.2
10.2.Chemical stability	<ul style="list-style-type: none"> ‡ 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	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Effects and symptoms caused by hydrogen cyanide depends on the intensity and duration of exposure. Short term inhalation of 20-40 ppm hydrogen cyanide may result in slight symptoms, while 270 ppm can be fatal in one minute.
Ingestion	Rats fed formamide for up to ten days, at 1.5 g/kg, all died. Autopsy indicated a cumulative effect with changes characteristic of gastritis and malnutrition The material has NOT been classified by EC Directives or other classification systems as "harmful by ingestion". This is because of the lack of corroborating animal or human evidence.
Skin Contact	The liquid may be miscible with fats or oils and may degrease the skin, producing a skin reaction described as non-allergic contact dermatitis. The material is unlikely to produce an irritant dermatitis as described in EC Directives . 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.
Eye	Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).
Chronic	Ample evidence exists, from results in experimentation, that developmental disorders are directly caused by human exposure to the material. Repeated exposure to formamide may affect the central nervous system and may cause liver and kidney damage. Rats treated with 3000 mg/kg formamide by semioclusive patches to the skin, 6 hours/day, 5 days/week for 3 months showed general poor health including a number of organ weight changes. Rats receiving 300 mg/kg developed polycythaemia. Formamide is listed as a 'suggested' teratogen. This possible hazard should be discussed with all employees who may become pregnant. Although it has been reported that application of formamide to the skin of pregnant mice resulted in the inhibition of foetal growth and foetal malformations, gross foetal abnormalities were not observed following dermal application to rats. In mice such effects were weak and could only be produced by application of large volumes.

Kreatech FISH probe ROW	TOXICITY	IRRITATION
	Not Available	Not Available
water	TOXICITY	IRRITATION
	Not Available	Not Available
formamide	TOXICITY	IRRITATION
	dermal (rat) LD50: >3000 mg/kg ^[1]	Eye (rabbit): 23 mg
	Inhalation (rat) LC50: >21 mg/l4 h ^[1]	
	Inhalation (rat) LC50: >3900 ppm/6H ^[2]	
	Oral (rat) LD50: ca.3200 mg/kg ^[1]	

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extracted from RTECS - Register of Toxic Effect of chemical Substances

Kreatech FISH probe ROW	<p>No significant acute toxicological data identified in literature search. for formamide:</p> <p>Acute toxicity: Toxicokinetic studies with rats or mice following a single oral administration showed that formamide was rapidly and completely absorbed in rats and mice, with peak plasma levels occurring within 2 h. The elimination half-life was about 15 h in rats and 4-6 h in mice. The metabolism and distribution of formamide were studied in rats and mice treated with ¹⁴C-labelled formamide via intravenous injection or inhalation exposure. The results showed that about 30% of formamide was excreted unchanged in urine within 72 h; about 30% (for rats) or 50% (for mice) was excreted as carbon dioxide in breath, and only a minor quantity (1-3%) was excreted in the faeces. It was suggested that cytochrome P450 2E1 was the primary enzyme of formamide metabolism</p> <p>Repeat dose toxicity: In repeated-dose short-term and subchronic toxicity studies, the main effects found in rats or mice include changes in haematological parameters, irrespective of route of exposure. In a subchronic study, an oral LOAEL of 40 mg/kg-bw per day was determined based on significant increases in haematocrit values, haemoglobin concentrations and erythrocyte counts in both male and female F344/N rats administered 0, 10, 20, 40, 80 or 160 mg formamide/kg-bw per day by gavage, 5 days/week for 14 weeks. The incidences of degeneration of the germinal epithelium of the testes and epididymis were significantly increased in males at the highest dose. The same oral LOAEL of 40 mg/kg-bw per day was also obtained based on a significant decrease in body weight gains in male B6C3F1 mice administered 0, 10, 20, 40, 80 or 160 mg formamide/kg-bw per day by gavage, 5 days/week for 14 weeks. Increased incidences of non-neoplastic lesions (hyperplasia and inflammation) were seen in pancreatic ducts at the dose of 80 mg/kg-bw per day. In a short-term study, a higher oral LOAEL of 113 mg/kg-bw per day was identified based on changes in haematological parameters, body weight loss, failure of reflexes, organ atrophy and tissue disintegration (gastrointestinal tract, testes, adrenal gland and kidney) in rats administered formamide at 0, 34, 113, 340 or 1130 mg/kg-bw per day by gavage.</p> <p>For dermal exposure, a LOAEL of 300 mg/kg-bw per day was identified based on haematological changes (increases in erythrocyte counts and hemoglobin) in rats treated with dermal applications of formamide at 0, 300, 1000 or 3000 mg/kg-bw per day for 90 days. At the highest dose level, clinical signs (e.g., erythema), pathological effects and an increased incidence of bilateral testicular tubular atrophy were seen. In a 2-week inhalation study, Crl:CD BR male rats were exposed to formamide at concentrations of 0, 190, 930 or 2800 mg/3 (6 h/day, 5 days/week). At the highest concentration (2800 mg/m³), microscopic lesions in the kidney (necrosis and regeneration of renal tubular epithelial cells) and an increase in kidney weights were observed. A lowest-observed-effect concentration (LOEC) of 930 mg/m³ (500 ppm) was identified, based on a significant decrease in the platelet count (haematological effect)</p> <p>Developmental toxicity: Formamide was found to be embryotoxic and teratogenic in several oral gavage studies using rabbits, rats and mice. The maternal toxicity caused by formamide included reduced food consumption, reduced body weight gain and decreased gravid uterine weight; foetal toxicity included reduced foetal weight and increased incidences of foetal death; and teratogenicity included skeletal malformations, cleft palate anencephaly and fused ribs.</p> <p>In rabbit studies, the lowest lowest-observed-adverse-effect levels (LOAELs) for maternal toxicity, embryo/foetal toxicity and teratogenicity were 79, 79 and 79 mg/kg-bw per day, respectively; embryotoxicity and teratogenicity were observed at maternally toxic doses. In rats, embryotoxicity (LOAEL = 100 mg/kg-bw per day) was seen in the absence of maternal toxicity (LOAEL = 200 mg/kg-bw per day for maternal toxicity). In mice, the lowest LOAELs for maternal toxicity, embryotoxicity and teratogenicity were 396, 198 and 198 mg/kg-bw per day, respectively; embryotoxicity and teratogenicity were seen in the absence of maternal toxicity. Among the test animals, the rabbit was the species that was the most sensitive to formamide in terms of developmental toxicity. Thus, the lowest oral LOAEL for developmental toxicity (maternal toxicity, embryo/foetal toxicity and teratogenicity) is identified to be 79 mg/kg-bw per day in rabbits.</p> <p>Embryotoxicity or teratogenicity was also observed in experimental rats or mice through dermal exposure. In rats, the lowest LOAELs for maternal toxicity, embryotoxicity (early foetal deaths) and teratogenicity (distorted face or subcutaneous hemorrhage) were 600, 600 and 600 mg/kg-bw per day, respectively. In mice, the lowest dermal LOAEL for embryotoxicity was determined to be 300 mg/kg-bw per day based on an increase in early foetal deaths. The foetal abnormalities were observed only at the high-dose exposure (>2800 mg/kg-bw per day) in mice</p> <p>Reproductive toxicity: The reproductive toxicity of formamide was evaluated using the Reproductive Assessment by Continuous Breeding protocols in Swiss CD-1 mice treated at concentrations of 0, 100, 350 and 750 mg/L (equivalent to 0, 16-32, 48-110 and 144-226 mg/kg-bw per day, respectively) in drinking water. Reproductive toxicity was observed at 750 mg/L (144-226 mg/kg-bw per day) in parental F0 and offspring F1 generations, and the critical effects included decreases in fertility rate and reduction in live litter size. A crossover mating experiment suggested that the reduced fertility rate may be due to impairment of reproduction in females. In addition, after offspring F1 mating, reduced offspring F2 litter size, increased days to litter, reduced relative ovarian weight and lengthened oestrous cycles were observed at 750 mg/L. The no-observed-adverse-effect level (NOAEL) for the reproductive toxicity of formamide was 350 mg/L (48-110 mg/kg-bw per day), and the LOAEL for the reproductive toxicity of formamide was 750 mg/L (144-226 mg/kg-bw per day) for both generations</p> <p>Carcinogenicity: The results from NTP studies showed no evidence of carcinogenic activity of formamide in male or female rats. There was clear evidence of carcinogenic activity of formamide in male mice, based on increased incidences of haemangiosarcoma in the liver; there was equivocal evidence of carcinogenic activity in female mice, based on marginally increased incidences of hepatocellular adenoma or carcinoma (significant only when adenoma and carcinoma were combined).</p> <p>No neoplastic lesions were observed in either male or female F344/N rats exposed to formamide at doses up to 80 mg/kg-bw per day. However, an increased incidence of bone marrow hyperplasia occurred in male rats.</p> <p>Genotoxicity: Formamide showed no evidence for mutagenicity in a series of short-term bioassays. Formamide was not mutagenic in Ames tests with several strains of <i>Salmonella typhimurium</i> or in a mutagenicity assay with <i>Escherichia coli</i> strain WPuvrA pKM101, with or without liver S9 metabolic activation. Formamide gave negative results in the sex-linked recessive lethal mutation assay in germ cells of male <i>Drosophila melanogaster</i> treated with formamide by either feeding or injection. In <i>in vivo</i> micronucleus tests, formamide did not induce increases in micronucleated erythrocytes in male or female mice treated with formamide (0-160 mg/kg-bw per day) by gavage for 3 months, although in another study, a dose-dependent increase in the number of polychromatic erythrocytes containing micronuclei was seen in bone marrow of mice exposed to formamide via intraperitoneal injection at higher doses (225-1800 mg/kg-bw), with significance at doses of 900 mg/kg-bw or higher. However, at the dose of 160 mg/kg-bw, increased incidences of lesions of several tissues/organs and decreased body weights were seen in mice, suggesting that the observed induction of micronuclei may be attributed to the cell damage.</p> <p>In a review paper on the biological effects of formamide, it was suggested that formamide caused cancer by a non-genotoxic mode of action. Based on the evidence of carcinogenicity observed in only one organ (liver), one sex (male) and one species (mice) and the conclusion that formamide is not mutagenic, the tumours observed in the experimental animals are unlikely to have resulted from direct interaction with genetic material. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.</p>
FORMAMIDE	<p>for formamide:</p> <p>Acute toxicity: Toxicokinetic studies with rats or mice following a single oral administration showed that formamide was rapidly and completely absorbed in rats and mice, with peak plasma levels occurring within 2 h. The elimination half-life was about 15 h in rats and 4-6 h in mice. The metabolism and distribution of formamide were studied in rats and mice treated with ¹⁴C-labelled formamide via intravenous injection or inhalation exposure. The results showed that about 30% of formamide was excreted unchanged in urine within 72 h; about 30% (for rats) or 50% (for mice) was excreted as carbon dioxide in breath, and only a minor quantity (1-3%) was excreted in the faeces. It was suggested that cytochrome P450 2E1 was the primary enzyme of formamide metabolism</p> <p>Repeat dose toxicity: In repeated-dose short-term and subchronic toxicity studies, the main effects found in rats or mice include changes in haematological parameters, irrespective of route of exposure. In a subchronic study, an oral LOAEL of 40 mg/kg-bw per day was determined based on significant increases in haematocrit values, haemoglobin concentrations and erythrocyte counts in both male and female F344/N rats administered 0, 10, 20, 40, 80 or 160 mg formamide/kg-bw per day by gavage, 5 days/week for 14 weeks. The incidences of degeneration of the germinal epithelium of the testes and epididymis were significantly increased in males at the highest dose. The same oral LOAEL of 40 mg/kg-bw per day was also obtained based on a significant decrease in body weight gains in male B6C3F1 mice administered 0, 10, 20, 40, 80 or 160 mg formamide/kg-bw per day by gavage, 5 days/week for 14 weeks. Increased incidences of non-neoplastic lesions (hyperplasia and inflammation) were seen in pancreatic ducts at the dose of 80 mg/kg-bw per day. In a short-term study, a higher oral LOAEL of 113 mg/kg-bw per day was identified based on changes in haematological parameters,</p>

Kreatech FISH probe ROW

body weight loss, failure of reflexes, organ atrophy and tissue disintegration (gastrointestinal tract, testes, adrenal gland and kidney) in rats administered formamide at 0, 34, 113, 340 or 1130 mg/kg-bw per day by gavage.

For dermal exposure, a LOAEL of 300 mg/kg-bw per day was identified based on haematological changes (increases in erythrocyte counts and hemoglobin) in rats treated with dermal applications of formamide at 0, 300, 1000 or 3000 mg/kg-bw per day for 90 days. At the highest dose level, clinical signs (e.g., erythema), pathological effects and an increased incidence of bilateral testicular tubular atrophy were seen.

In a 2-week inhalation study, Crl:CD BR male rats were exposed to formamide at concentrations of 0, 190, 930 or 2800 mg/3 (6 h/day, 5 days/week). At the highest concentration (2800 mg/m³), microscopic lesions in the kidney (necrosis and regeneration of renal tubular epithelial cells) and an increase in kidney weights were observed. A lowest-observed-effect concentration (LOEC) of 930 mg/m³ (500 ppm) was identified, based on a significant decrease in the platelet count (haematological effect)

Developmental toxicity: Formamide was found to be embryotoxic and teratogenic in several oral gavage studies using rabbits, rats and mice. The maternal toxicity caused by formamide included reduced food consumption, reduced body weight gain and decreased gravid uterine weight; foetal toxicity included reduced foetal weight and increased incidences of foetal death; and teratogenicity included skeletal malformations, cleft palate anencephaly and fused ribs.

In rabbit studies, the lowest lowest-observed-adverse-effect levels (LOAELs) for maternal toxicity, embryo/foetal toxicity and teratogenicity were 79, 79 and 79 mg/kg-bw per day, respectively; embryotoxicity and teratogenicity were observed at maternally toxic doses. In rats, embryotoxicity (LOAEL = 100 mg/kg-bw per day) was seen in the absence of maternal toxicity (LOAEL = 200 mg/kg-bw per day for maternal toxicity). In mice, the lowest LOAELs for maternal toxicity, embryotoxicity and teratogenicity were 396, 198 and 198 mg/kg-bw per day, respectively; embryotoxicity and teratogenicity were seen in the absence of maternal toxicity. Among the test animals, the rabbit was the species that was the most sensitive to formamide in terms of developmental toxicity. Thus, the lowest oral LOAEL for developmental toxicity (maternal toxicity, embryo/foetal toxicity and teratogenicity) is identified to be 79 mg/kg-bw per day in rabbits.

Embryotoxicity or teratogenicity was also observed in experimental rats or mice through dermal exposure. In rats, the lowest LOAELs for maternal toxicity, embryotoxicity (early foetal deaths) and teratogenicity (distorted face or subcutaneous hemorrhage) were 600, 600 and 600 mg/kg-bw per day, respectively. In mice, the lowest dermal LOAEL for embryotoxicity was determined to be 300 mg/kg-bw per day based on an increase in early foetal deaths. The foetal abnormalities were observed only at the high-dose exposure (>2800 mg/kg-bw per day) in mice.

Reproductive toxicity: The reproductive toxicity of formamide was evaluated using the Reproductive Assessment by Continuous Breeding protocols in Swiss CD-1 mice treated at concentrations of 0, 100, 350 and 750 mg/L (equivalent to 0, 16-32, 48-110 and 144-226 mg/kg-bw per day, respectively) in drinking water. Reproductive toxicity was observed at 750 mg/L (144-226 mg/kg-bw per day) in parental F0 and offspring F1 generations, and the critical effects included decreases in fertility rate and reduction in live litter size. A crossover mating experiment suggested that the reduced fertility rate may be due to impairment of reproduction in females. In addition, after offspring F1 mating, reduced offspring F2 litter size, increased days to litter, reduced relative ovarian weight and lengthened oestrous cycles were observed at 750 mg/L. The no-observed-adverse-effect level (NOAEL) for the reproductive toxicity of formamide was 350 mg/L (48-110 mg/kg-bw per day), and the LOAEL for the reproductive toxicity of formamide was 750 mg/L (144-226 mg/kg-bw per day) for both generations.

Carcinogenicity: The results from NTP studies showed no evidence of carcinogenic activity of formamide in male or female rats. There was clear evidence of carcinogenic activity of formamide in male mice, based on increased incidences of haemangiosarcoma in the liver; there was equivocal evidence of carcinogenic activity in female mice, based on marginally increased incidences of hepatocellular adenoma or carcinoma (significant only when adenoma and carcinoma were combined).

No neoplastic lesions were observed in either male or female F344/N rats exposed to formamide at doses up to 80 mg/kg-bw per day. However, an increased incidence of bone marrow hyperplasia occurred in male rats.

Genotoxicity: Formamide showed no evidence for mutagenicity in a series of short-term bioassays. Formamide was not mutagenic in Ames tests with several strains of *Salmonella typhimurium* or in a mutagenicity assay with *Escherichia coli* strain WPuvrA pKM101, with or without liver S9 metabolic activation. Formamide gave negative results in the sex-linked recessive lethal mutation assay in germ cells of male *Drosophila melanogaster* treated with formamide by either feeding or injection. In *in vivo* micronucleus tests, formamide did not induce increases in micronucleated erythrocytes in male or female mice treated with formamide (0-160 mg/kg-bw per day) by gavage for 3 months, although in another study, a dose-dependent increase in the number of polychromatic erythrocytes containing micronuclei was seen in bone marrow of mice exposed to formamide via intraperitoneal injection at higher doses (225-1800 mg/kg-bw), with significance at doses of 900 mg/kg-bw or higher. However, at the dose of 160 mg/kg-bw, increased incidences of lesions of several tissues/organs and decreased body weights were seen in mice, suggesting that the observed induction of micronuclei may be attributed to the cell damage.

In a review paper on the biological effects of formamide, it was suggested that formamide caused cancer by a non-genotoxic mode of action. Based on the evidence of carcinogenicity observed in only one organ (liver), one sex (male) and one species (mice) and the conclusion that formamide is not mutagenic, the tumours observed in the experimental animals are unlikely to have resulted from direct interaction with genetic material.

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

SODIUM CHLORIDE

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. 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. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.

The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. 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.

SODIUM CITRATE DIHYDRATE

for citric acid (and its inorganic citrate salts)

Based on many experimental data in animals and on human experience, citric acid is of low acute toxicity. The NOAEL for repeated dose toxicity for rats is 1200 mg/kg/d. The major, reversible (sub)chronic toxic effects seem to be limited to changes in blood chemistry and metal absorption/excretion kinetics. Citric acid is not suspected of being a carcinogen nor a reprotoxic or teratogenic agent. The NOAEL for reproductive toxicity for rats is 2500 mg/kg/d. Further, it is not mutagenic *in vitro* and *in vivo*. Also, the sensitising potential is seen as low. In contrast, irritation, in particular of the eyes but also of the respiratory pathways and the skin, is the major toxicological hazard presented by citric acid

water & DEXTRAN SULFATE

No significant acute toxicological data identified in literature search.

Acute Toxicity	☒	Carcinogenicity	☒
Skin Irritation/Corrosion	☒	Reproductivity	☑
Serious Eye Damage/Irritation	☒	STOT - Single Exposure	☒
Respiratory or Skin sensitisation	☒	STOT - Repeated Exposure	☒

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Mutagenicity

Aspiration Hazard

Legend: ✔ – Data required to make classification available
✘ – Data available but does not fill the criteria for classification
⊖ – Data Not Available to make classification

SECTION 12 ECOLOGICAL INFORMATION

12.1. Toxicity

Environmental fate: Formamide may be released into the environment as a result of its production and use as solvent in manufacturing and processing plastics, non-aqueous electrolysis, and crystallization of pharmaceuticals and separation of chlorosilanes. According to Level III fugacity modeling, formamide will partition primarily in water and soil, depending on the compartment of release. Study shows that formamide is readily biodegradable in water, soil and sediment. Therefore, the compound is not expected to persist in soil and sediment. If released to air, formamide is expected to exist solely as a vapor in the ambient atmosphere based on the model of gas/particle partitioning of semivolatile organic compounds in the atmosphere. Vapor-phase formamide will be degraded in the atmosphere by reaction with photochemically produced hydroxyl radicals.

Ecotoxicity: Experimental data shows that formamide does not cause significant effect to aquatic organisms at low concentration. Likewise, modelled toxicity data shows that formamide is not expected to cause ecological harm at environmental concentrations.

Measured data:

Fish LC50 (96h): golden orfe (*Leuciscus idus*) 6.57 mg/l; zebra fish (*Danio rerio*)

9.14 mg/l Amphipod EC50 (96h): *Chaetogammarus marinus* 19 mg/l

Daphnia magna EC50 (48h): >500 mg/l

Algae EC50 (72h): *Scenedesmus subspicatus* >500

mg/l *Lemna minor* EC50 (24h): 81.2 mg/l

Modelled data:

Fish LC50 (96h): 82.6 mg/l (ECOSAR)

Daphnia LC50 (48h): 69 mg/l (ECOSAR)

Shrimp LC50 (96h): 313 mg/l (ECOSAR)

Alga EC50 (96h): 35 mg/l (ECOSAR)

For the Alkali Metal Cyanides:

Atmospheric Fate: It is unknown if atmospheric photolysis is an important fate process for alkali metal cyanides. Hydrogen cyanide is very resistant to photolysis in normal sunlight. The most important reaction of hydrogen cyanide in air is the reaction with photochemically-generated hydroxyl radicals and subsequent rapid oxidation to carbon monoxide (CO) and nitric oxide (NO); photolysis and reaction with ozone are not important transformation processes and reaction with singlet oxygen is not a significant transformation process except at stratospheric altitudes. The residence time for the reaction of hydrogen cyanide vapor with hydroxyl radicals in the atmosphere is approximately 2 years.

Terrestrial Fate: Low concentrations of cyanide in soil biodegrade under aerobic conditions. Under anaerobic conditions, cyanides ions will denitrify to gaseous nitrogen. Complexation reactions with metal ions may occur in soil and cyanide ions are sorbed by various natural media, including clays, biological solids and sediments. Hydrogen cyanide and the alkali metal cyanides are not likely to be strongly sorbed onto sediments and suspended solids. Cyanides are fairly mobile in soil. Mobility is lowest in low pH soils with high concentrations of free iron oxides, positively charged particles and clays and highest in soils with high pH, high concentrations of free calcium carbonate (CaCO₃), negatively charged particles and low clay content. In soils where cyanide levels are high enough to be toxic to microorganisms, this compound may leach into groundwater. Volatilization of hydrogen cyanide would be a significant loss mechanism from soil surfaces at a pH <9.2. Aquatic Fate: The alkali metal cyanides are very soluble in water and readily dissociate. Depending on the pH of the water, the resulting cyanide ion may form hydrogen cyanide or react with various metals. The proportion of hydrogen cyanide formed from soluble cyanides increases as the water pH decreases. Volatilization is the dominant mechanism for the removal of free cyanide from water and is most effective under conditions of high temperatures, high dissolved oxygen levels, and at increased concentrations of atmospheric carbon dioxide. Insoluble metal cyanides are not expected to degrade to hydrogen cyanide. Oxidation, hydrolysis, and photolysis are the three predominant chemical processes that may cause loss of simple cyanides in aquatic media. Certain cyanides are oxidized to isocyanates by strong oxidizing agents which may be further hydrolyzed to ammonia and carbon dioxide; however, it has not yet been determined whether this is a significant fate process in waters containing peroxy radicals. Hydrogen cyanide can be hydrolyzed to formamide, which is subsequently hydrolyzed to ammonium and formate ions.

Volatilization is a significant and probably dominant fate process for hydrogen cyanide and the most common alkali metal cyanides (e.g., sodium and potassium cyanide) in surface water. Copper (I) cyanide is removed from water predominantly by sedimentation and biodegradation. Volatilization is not an important fate process for cyanide in groundwater and is expected to persist for considerably longer periods of time in underground aquifers than in surface water. Photocatalytic oxidation may not be significant in natural waters. In clear water, or at water surfaces, some metalocyanides may decompose to the cyanide ion by photodissociation and subsequently form hydrogen cyanide. Biodegradation is an important transformation process for cyanide in natural surface waters, and is dependent on such factors as cyanide concentration, pH, temperature, nutrient availability and microbial acclimation.

Ecotoxicity: Cyanide is toxic to microorganisms in low concentration; however, acclimation increases tolerance. Actinomyces, Alcaligenes, Arthrobacter, Bacillus, Micrococcus, Neisseria, Paracoccus, Pseudomonas, and Thiobacillus bacteria are particularly effective at cyanide degradation. Certain metal cyanide complexes may bioaccumulate in aquatic organisms. It is difficult to evaluate the toxicologic significance of bioaccumulation of metal cyanide complexes because these compounds are much less toxic than soluble hydrogen cyanide, sodium cyanide, or potassium cyanide. There is no evidence of biomagnification of cyanides in the food chain and accumulation of cyanide in food webs is not expected.

DO NOT discharge into sewer or waterways.

12.2. Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
water	LOW	LOW
formamide	LOW	LOW
sodium chloride	LOW	LOW

12.3. Bioaccumulative potential

Ingredient	Bioaccumulation
water	LOW (LogKOW = -1.38)
formamide	LOW (LogKOW = -1.51)
sodium chloride	LOW (LogKOW = 0.5392)

12.4. Mobility in soil

Ingredient	Mobility
water	LOW (KOC = 14.3)
formamide	HIGH (KOC = 1.498)
sodium chloride	LOW (KOC = 14.3)

12.5. Results of PBT and vPvB assessment

	P	B	T
Relevant available data	Not Available	Not Available	Not Available
PBT Criteria fulfilled?	Not Available	Not Available	Not Available

Continued...

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12.6. Other adverse effects

No data available

SECTION 13 DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Product / Packaging disposal	<ul style="list-style-type: none"> ▶ Containers may still present a chemical hazard/ danger when empty. ▶ Return to supplier for reuse/ recycling if possible. Otherwise: <ul style="list-style-type: none"> ▶ If container can not 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 authorised landfill. ▶ Where possible retain label warnings and SDS and observe all notices pertaining to the product. <p>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.</p> <p>A Hierarchy of Controls seems to be common - the user should investigate:</p> <ul style="list-style-type: none"> ▶ Reduction ▶ Reuse ▶ Recycling ▶ Disposal (if all else fails) <p>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.</p> <ul style="list-style-type: none"> ▶ 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 State Land Waste Authority for disposal. ▶ Bury or incinerate residue at an approved site. ▶ Recycle containers if possible, or dispose of in an authorised landfill.
Waste treatment options	Not Available
Sewage disposal options	Not Available

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO
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Land transport (Not Applicable): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

14.1. UN number	Not Applicable														
14.2. Packing group	Not Applicable														
14.3. UN proper shipping name	Not Applicable														
14.4. Environmental hazard	No relevant data														
14.5. Transport hazard class(es)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Class</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>Subrisk</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> </table>	Class	Not Applicable	Subrisk	Not Applicable										
Class	Not Applicable														
Subrisk	Not Applicable														
14.6. Special precautions for user	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Hazard identification (Kemler)</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>Classification code</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>Hazard Label</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>Special provisions</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>Explosive Limit and Limited Quantity Index</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>ERAP Index</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>Limited quantity</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> </table>	Hazard identification (Kemler)	Not Applicable	Classification code	Not Applicable	Hazard Label	Not Applicable	Special provisions	Not Applicable	Explosive Limit and Limited Quantity Index	Not Applicable	ERAP Index	Not Applicable	Limited quantity	Not Applicable
Hazard identification (Kemler)	Not Applicable														
Classification code	Not Applicable														
Hazard Label	Not Applicable														
Special provisions	Not Applicable														
Explosive Limit and Limited Quantity Index	Not Applicable														
ERAP Index	Not Applicable														
Limited quantity	Not Applicable														

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

14.1. UN number	Not Applicable						
14.2. Packing group	Not Applicable						
14.3. UN proper shipping name	Not Applicable						
14.4. Environmental hazard	No relevant data						
14.5. Transport hazard class(es)	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">ICAO/IATA Class</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>ICAO / IATA Subrisk</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>ERG Code</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> </table>	ICAO/IATA Class	Not Applicable	ICAO / IATA Subrisk	Not Applicable	ERG Code	Not Applicable
ICAO/IATA Class	Not Applicable						
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ERG Code	Not Applicable						
14.6. Special precautions for user	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 60%;">Special provisions</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>Cargo Only Packing Instructions</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> <tr> <td>Cargo Only Maximum Qty / Pack</td> <td style="border-left: 1px dashed black;">Not Applicable</td> </tr> </table>	Special provisions	Not Applicable	Cargo Only Packing Instructions	Not Applicable	Cargo Only Maximum Qty / Pack	Not Applicable
Special provisions	Not Applicable						
Cargo Only Packing Instructions	Not Applicable						
Cargo Only Maximum Qty / Pack	Not Applicable						

Continued...

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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. Packing group	Not Applicable	
14.3. UN proper shipping name	Not Applicable	
14.4. Environmental hazard	Not Applicable	
14.5. Transport hazard class(es)	IMDG Class	Not Applicable
	IMDG Subrisk	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. Packing group	Not Applicable	
14.3. UN proper shipping name	Not Applicable	
14.4. Environmental hazard	No relevant data	
14.5. Transport hazard class(es)	Not Applicable	Not Applicable
14.6. Special precautions for user	Classification code	Not Applicable
	Limited quantity	Not Applicable
	Equipment required	Not Applicable
	Fire cones number	Not Applicable

Transport in bulk according to Annex II of MARPOL 73 / 78 and the IBC code

Source	Ingredient	Pollution Category
IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk	formamide	Y

SECTION 15 REGULATORY INFORMATION**15.1. Safety, health and environmental regulations / legislation specific for the substance or mixture****WATER(7732-18-5*) IS FOUND ON THE FOLLOWING REGULATORY LISTS**

EU REACH Regulation (EC) No 1907/2006 - Annex IV - Exemptions from the Obligation to Register in Accordance with Article 2(7)(a) (English)
European Customs Inventory of Chemical Substances ECICS (English)

European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)

FORMAMIDE(75-12-7) IS FOUND ON THE FOLLOWING REGULATORY LISTS

EU REACH Regulation (EC) No 1907/2006 - Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles
EU REACH Regulation (EC) No 1907/2006 - Annex XVII (Appendix 6) Toxic to reproduction: category 1B (Table 3.1)/category 2 (Table 3.2)

European Trade Union Confederation (ETUC) Priority List for REACH Authorisation
European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)

EU REACH Regulation (EC) No 1907/2006 - Proposals to identify Substances of Very High Concern: Annex XV reports for commenting by Interested Parties
Europe AeroSpace and Defence Industries Association of Europe (ASD) REACH Implementation Working Group Priority Declarable Substances List (PDSL)

European Union (EU) Annex I to Directive 67/548/EEC on Classification and Labelling of Dangerous Substances - updated by ATP: 31
European Union (EU) Annex I to Directive 67/548/EEC on Classification and Labelling of Dangerous Substances (updated by ATP: 31) - Reprotoxic Substances
European Union (EU) Regulation (EC) No 1272/2008 on Classification, Labelling and Packaging of Substances and Mixtures - Annex VI
Netherlands Non-exhaustive list of reproductive toxins which additional registration requirement applicable under Article 4.2a, second paragraph of the Working Conditions Decree (Dutch)

Europe European Chemicals Agency (ECHA) Candidate List of Substances of Very High Concern for Authorisation
European Customs Inventory of Chemical Substances ECICS (English)

DEXTRAN SULFATE(9063-02-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Not Applicable

SODIUM CHLORIDE(7647-14-5) IS FOUND ON THE FOLLOWING REGULATORY LISTS

European Customs Inventory of Chemical Substances ECICS (English)

European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)

SODIUM CITRATE DIHYDRATE(6132-04-3) IS FOUND ON THE FOLLOWING REGULATORY LISTS

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European Customs Inventory of Chemical Substances ECICS (English)

European Union - European Inventory of Existing Commercial Chemical Substances (EINECS) (English)

This safety data sheet is in compliance with the following EU legislation and its adaptations - as far as applicable - : 67/548/EEC, 1999/45/EC, 98/24/EC, 92/85/EC, 94/33/EC, 91/689/EEC, 1999/13/EC, Commission Regulation (EU) 2015/830, Regulation (EC) No 1272/2008 and their amendments as well as the following British legislation: - The Control of Substances Hazardous to Health Regulations (COSHH) 2002 - COSHH Essentials - The Management of Health and Safety at Work Regulations 1999

15.2. Chemical safety assessment

For further information please look at the Chemical Safety Assessment and Exposure Scenarios prepared by your Supply Chain if available.

National Inventory	Status
Australia - AICS	Y
Canada - DSL	N (dextran sulfate)
Canada - NDSL	N (water; sodium chloride; formamide; sodium citrate dihydrate)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (dextran sulfate)
Japan - ENCS	N (water; dextran sulfate)
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	N (dextran sulfate)
USA - TSCA	Y
Legend:	<i>Y = All ingredients are on the inventory N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)</i>

SECTION 16 OTHER INFORMATION**Full text Risk and Hazard codes**

H315	Causes skin irritation
H319	Causes serious eye irritation
H335	May cause respiratory irritation
H360D ***	H360D ***

Other information**Ingredients with multiple cas numbers**

Name	CAS No
sodium chloride	14762-51-7, 16887-00-6, 7647-14-5

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at: www.chemwatch.net

The (M)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