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Revision Number 2.1

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING**Product identifier****Product Name** GA#-LS1**Other means of identification****Product Code(s)** 11328976**UN/ID no.** UN3139**Synonyms** None**Recommended use of the chemical and restrictions on use****Recommended use** reagent**Details of the supplier of the safety data sheet****Manufacturer Address**Illumina, Inc.
5200 Illumina Way
San Diego, CA 92122 USA
www.illumina.com**Company Phone Number**1-858-809-ILMN
1-858-202-4566**E-mail address**

SDS@illumina.com

Emergency telephone number**24 Hour Emergency Phone Number** 1-760-476-3962**2. HAZARDS IDENTIFICATION****GHS Classification****OSHA Regulatory Status**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Oxidizing liquids	Category 1
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Carcinogenicity	Category 2
Reproductive toxicity	Category 1B
Specific target organ toxicity (repeated exposure)	Category 1

Label elements**Emergency Overview****Signal word**

Danger

Hazard statementsCauses skin irritation
Causes serious eye irritation
Suspected of causing cancer
May damage fertility or the unborn child

Causes damage to organs through prolonged or repeated exposure
Harmful to aquatic life
May cause fire or explosion; strong oxidizer



Appearance colorless liquid

Physical state Liquid

Odor Odorless To mild

Precautionary Statements - Prevention

Keep away from heat
Keep/Store away from clothing/ and other /combustible materials
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Do not breathe dust/fume/gas/mist/vapors/spray
Do not eat, drink or smoke when using this product
Wear fire/flame resistant/retardant clothing
Wear protective gloves/protective clothing/eye protection/face protection
Wash face, hands and any exposed skin thoroughly after handling
Avoid release to the environment

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
If eye irritation persists: Get medical advice/attention

IF ON SKIN: Wash with plenty of soap and water
If skin irritation occurs: Get medical advice/attention
Take off contaminated clothing and wash before reuse

IF ON CLOTHING: rinse immediately contaminated clothing and skin with plenty of water before removing clothes
In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion
In case of fire: Use Water spray, fog or regular foam for extinction

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Disposal

Dispose of contents/container to an approved waste disposal plant

Hazards not otherwise classified (HNOC)

Not applicable

Other Information

Unknown acute toxicity

52.1 % of the mixture consists of ingredient(s) of unknown toxicity

3. COMPOSITION/INFORMATION ON INGREDIENTS

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Chemical name	CAS No	Weight-%	Trade Secret
Formamide	75-12-7	30 - 60	*
Sodium (meta)periodate	7790-28-5	1 - 5	*

*The exact percentage (concentration) of composition has been withheld as a trade secret.

4. FIRST AID MEASURES

Description of first aid measures

General advice	Treat symptomatically. Use first aid treatment according to the nature of the injury. Remove and isolate contaminated clothing and shoes.
Eye contact	In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
Skin Contact	Wash skin with soap and water. Get medical attention if irritation develops and persists.
Inhalation	If symptomatic, move to fresh air. Get medical attention if symptoms persist. Move victim to fresh air.
Ingestion	Get medical advice/attention.
Self-protection of the first aider	Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

Most important symptoms and effects, both acute and delayed

Symptoms	May damage fertility or the unborn child. Persons with impaired reproductive function may be more susceptible to the effects of this material. May cause cancer. May cause damage to organs through prolonged or repeated exposure.
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Indication of any immediate medical attention and special treatment needed

Note to physicians	Treat symptomatically.
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5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Dry chemical, CO₂, water spray or regular foam, Water spray, fog or regular foam, Move containers from fire area if you can do it without risk, Dike fire-control water for later disposal

Unsuitable extinguishing media

Do not scatter spilled material with high pressure water streams.

Specific hazards arising from the chemical

Some may burn but none ignite readily. Those substances designated with a "P" may polymerize explosively when heated or

involved in a fire. Some may be transported hot.

Hazardous combustion products

Carbon oxides. Ammonia. Nitrogen oxides (NOx). Hydrogen cyanide.

Explosion data

Sensitivity to Mechanical Impact None.

Sensitivity to Static Discharge None.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions Do not touch or walk through spilled material. Stop leak if you can do it without risk. Avoid breathing dust/fume/gas/mist/vapors/spray.

For emergency responders Use personal protection recommended in Section 8. Keep unnecessary personnel away.

Environmental precautions

Environmental precautions Prevent entry into waterways, sewers, basements or confined areas.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Prevent runoff from entering drains, sewers, or streams.

Methods for cleaning up Use personal protective equipment as required. Contain and collect spillage with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see Section 13). Large spill. Prevent runoff from entering drains, sewers, or streams. Dike far ahead of liquid spill for later disposal.

Prevention of secondary hazards Clean contaminated objects and areas thoroughly observing environmental regulations.

7. HANDLING AND STORAGE

Precautions for safe handling

Advice on safe handling Use personal protective equipment as required. Handle in accordance with good industrial hygiene and safety practice. Do not breathe vapor.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed. Keep/store only in original container. Store away from incompatible materials. Store at -15° C to -25° C (5° F to -13° F).

Incompatible materials Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

Chemical name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Formamide 75-12-7	TWA: 10 ppm Skin	(vacated) TWA: 20 ppm (vacated) TWA: 30 mg/m ³ (vacated) STEL: 30 ppm (vacated) STEL: 45 mg/m ³	TWA: 10 ppm TWA: 15 mg/m ³

NIOSH IDLH *Immediately Dangerous to Life or Health*

Other Information Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Appropriate engineering controls

Engineering Controls Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear safety glasses with side shields (or goggles).

Skin and body protection Wear chemical-resistant gloves, footwear and protective clothing appropriate for risk of exposure. Contact glove manufacturer for specific information.

Respiratory protection If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

General Hygiene Considerations When using do not eat, drink or smoke. Wash hands thoroughly after handling. Handle in accordance with good industrial hygiene and safety practice. Regular cleaning of equipment, work area and clothing is recommended.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Physical state Liquid
Appearance colorless liquid
Odor Odorless To mild
Color colorless
Odor threshold No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	No data available	
Melting point / freezing point	No data available	
Boiling point / boiling range		
Flash point		
Evaporation rate	No data available	
Flammability (solid, gas)	No data available	
Flammability Limit in Air		
Upper flammability or explosive limits	No data available	

Lower flammability or explosive limits	No data available
Vapor pressure	No data available
Vapor density	No data available
Specific gravity	No data available
Water solubility	No data available
Solubility in other solvents	No data available
Partition coefficient	No data available
Autoignition temperature	No data available
Decomposition temperature	No data available
Kinematic viscosity	No data available
Dynamic viscosity	No data available
Explosive properties	No unusual fire or explosion hazards noted.
Oxidizing properties	No data available

Other information

Softening point	No data available
Molecular weight	No data available
VOC Content (%)	No data available
Liquid Density	No data available
Bulk density	No data available

10. STABILITY AND REACTIVITY

Reactivity**Chemical stability**

Stable under normal conditions. Stable under recommended storage conditions.

Possibility of Hazardous Reactions

None under normal processing.

Hazardous polymerization

Hazardous polymerization does not occur.

Conditions to avoid

None known.

Incompatible materials

Strong oxidizing agents.

Hazardous decomposition products

Carbon oxides. Ammonia. Nitrogen oxides (NOx). Hydrogen cyanide.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information	Reproductive toxicant
Inhalation	Under normal conditions of intended use, this material is not expected to be an inhalation hazard.
Eye contact	Causes serious eye irritation.

Skin Contact Causes skin irritation.

Ingestion No harmful effects expected in amounts likely to be ingested by accident.

Component Information

Chemical name	Oral LD50	Dermal LD50	Inhalation LC50
Formamide 75-12-7	= 5577 mg/kg (Rat) > 5000 mg/kg (Rat)	-	> 3900 ppm (Rat) 6 h

Information on toxicological effects

Symptoms None known.

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Skin corrosion/irritation Causes skin irritation.

Serious eye damage/eye irritation Causes serious eye irritation.

Skin sensitization Not classified.

Respiratory sensitization Not classified.

Germ cell mutagenicity Not classified.

Carcinogenicity Suspected of causing cancer.

Reproductive toxicity May damage fertility or the unborn child.

STOT - single exposure Not classified.

STOT - repeated exposure Causes damage to organs through prolonged or repeated exposure.

Chronic toxicity Contains a known or suspected reproductive toxin. May cause adverse effects on the bone marrow and blood-forming system.

Target organ effects Central nervous system, Eyes, Reproductive System, Respiratory system, Skin, blood.

Aspiration hazard Not classified.

Other adverse effects No information available.

Numerical measures of toxicity - Product Information

Unknown acute toxicity 52.1 % of the mixture consists of ingredient(s) of unknown toxicity

12. ECOLOGICAL INFORMATION**Ecotoxicity**

Harmful to aquatic life

0 % of the mixture consists of components(s) of unknown hazards to the aquatic environment

Chemical name	Algae/aquatic plants	Fish	Crustacea
Formamide 75-12-7	500 mg/L: EC50 72 h Desmodesmus subspicatus 500 mg/L: EC50 96 h Desmodesmus subspicatus	4600 - 9300 mg/L: LC50 96 h Leuciscus idus static 9135 mg/L: LC50 96 h Brachydanio rerio static	500 mg/L: EC50 48 h Daphnia magna

Persistence and degradability

Readily biodegradable.

Bioaccumulation

Chemical name	Partition coefficient
Formamide	-0.82

75-12-7

Mobility

No data available.

Other adverse effects

No data available

Ozone

Not classified

Ozone depletion potential (ODP)

No information available

13. DISPOSAL CONSIDERATIONS**Waste treatment methods****Disposal of wastes**

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Contaminated packaging

Do not reuse container. Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. TRANSPORT INFORMATION**DOT**

UN/ID no.	UN3139
Proper shipping name	Oxidizing liquid, n.o.s. (Sodium (meta)periodate)
Hazard Class	5.1
Packing Group	III
Description	UN3139, Oxidizing liquid, n.o.s. (Sodium (meta)periodate), 5.1, III

TDG

UN/ID no.	UN3139
Proper shipping name	OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate)
Hazard Class	5.1
Packing Group	III
Description	UN3139, OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate), 5.1, III

MEX

UN/ID no.	UN3139
Proper shipping name	OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate)
Hazard Class	5.1
Packing Group	III
Description	UN3139, OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate), 5.1, III

ICAO (air)

UN/ID no.	UN3139
Proper shipping name	Oxidizing liquid, n.o.s. (Sodium (meta)periodate)
Hazard Class	5.1
Packing Group	III
Description	UN3139, Oxidizing liquid, n.o.s. (Sodium (meta)periodate), 5.1, III

IATA

UN number	UN3139
Proper shipping name	Oxidizing liquid, n.o.s. (Sodium (meta)periodate)
Transport hazard class(es)	5.1
Packing Group	III
Description	UN3139, Oxidizing liquid, n.o.s. (Sodium (meta)periodate), 5.1, III

IMDG

UN number	UN3139
Proper shipping name	OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate)
Transport hazard class(es)	5.1
Packing Group	III
Description	UN3139, OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate), 5.1, III

RID

UN/ID no.	UN3139
Proper shipping name	OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate)
Hazard Class	5.1
Packing Group	III
Description	UN3139, OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate), 5.1, III

ADR

UN number	UN3139
Proper shipping name	OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate)
Transport hazard class(es)	5.1
Packing Group	III
Description	UN3139, OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate), 5.1, III, (E)

ADN

UN/ID no.	UN3139
Proper shipping name	OXIDIZING LIQUID, N.O.S. (Sodium (meta)periodate)
Hazard Class	5.1
Packing Group	III
Description	UN3139, Oxidizing liquid, n.o.s. (Sodium (meta)periodate), 5.1, III

15. REGULATORY INFORMATION

International Inventories

TSCA	Complies
DSL/NDSL	Complies
EINECS/ELINCS	Complies
ENCS	Does not comply
IECSC	Complies
KECL	Complies
PICCS	Complies
AICS	Complies
INSQ	This product complies with INSQ

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSC - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances

PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances
INSQ - Mexican National Inventory of Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories

Acute health hazard	No
Chronic Health Hazard	Yes
Fire hazard	No
Sudden release of pressure hazard	No
Reactive Hazard	No

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical name	New Jersey	Massachusetts	Pennsylvania
Formamide 75-12-7	X	X	X
Water 7732-18-5	-	-	X

U.S. EPA Label Information

EPA Pesticide Registration Number Not applicable

16. OTHER INFORMATION

<u>NFPA</u>	Health hazards 2	Flammability 0	Instability 0	Physical and Chemical Properties -
<u>HMIS</u>	Health hazards 2	Flammability 0	Physical hazards 0	Personal protection X

Prepared By	Illumina Inc.
Issuing Date	16-Feb-2018
Revision date	22-Jan-2020
Revision Note	Not applicable.

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End of Safety Data Sheet