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Revision Number 3

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Product identifier

Product Name TG#-LDR, FORMAMIDE

Other means of identification

Product Code(s) 15070136

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

Company Phone Number

1-858-809-ILMN
1-858-202-4566

E-mail address

SDS@illumina.com

www.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).

Reproductive toxicity	Category 1B
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Label elements

Emergency Overview

Signal word

Danger

Hazard statements

May damage fertility or the unborn child



Appearance colorless liquid

Physical state Liquid

Odor Odorless To mild

Precautionary Statements - Prevention

Obtain special instructions before use
 Do not handle until all safety precautions have been read and understood
 Avoid breathing dust/fume/gas/mist/vapors/spray
 Do not eat, drink or smoke when using this product
 Wear protective gloves/protective clothing/eye protection/face protection
 Wash face, hands and any exposed skin thoroughly after handling
 Contaminated work clothing should not be allowed out of the workplace

Precautionary Statements - Response

IF exposed or concerned: Get medical advice/attention
 Call a POISON CENTER or doctor/physician if you feel unwell

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

May be harmful if inhaled

Unknown acute toxicity

99.9 % 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	60 - 100	*

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

4. FIRST AID MEASURES

Description of first aid measures**General advice**

Use first aid treatment according to the nature of the injury.

Eye contact

Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Get medical attention if irritation develops and persists.

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.

Ingestion

Get medical advice/attention.

Self-protection of the first aider

Use personal protective equipment as required. 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.

Indication of any immediate medical attention and special treatment needed

Note to physicians May damage fertility or the unborn child. Persons with impaired reproductive function may be more susceptible to the effects of this material.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Water, Water spray (fog), Foam, Dry chemical, Carbon dioxide (CO₂)

Unsuitable extinguishing media

None known.

Specific hazards arising from the chemical

None known.

Hazardous combustion products

Carbon oxides. Ammonia. Nitrogen oxides (NO_x). 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 Use personal protective equipment as required. Keep people away from and upwind of spill/leak.

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

Environmental precautions

Environmental precautions Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses, or onto the ground. See Section 12 for additional Ecological Information.

Methods and material for containment and cleaning up

Methods for containment Prevent further leakage or spillage if safe to do so. Dike far ahead of liquid spill for later disposal.

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.

Conditions for safe storage, including any incompatibilities

Storage Conditions Keep container tightly closed in a dry and well-ventilated place. Keep/store only in original container. Store away from incompatible materials.

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 Handle in accordance with good industrial hygiene and safety practice. Wash after handling this material and before eating, drinking and/or smoking. 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

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
pH	No data available	
Melting point / freezing point	3 °C / 37 °F	
Boiling point / boiling range	211 °C / 412 °F	
Flash point	154 °C / 309 °F	Cleveland Open Cup
Evaporation rate	No data available	
Flammability (solid, gas)	No data available	

Flammability Limit in Air

Upper flammability limit: No data available
 Lower flammability limit: No data available
 Vapor pressure: No data available
 Vapor density: 1.56
 Specific gravity: 1.13 @ 20 C°
 Water solubility: Soluble in water
 Solubility in other solvents: No data available
 Partition coefficient: -1.51
 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: 45.04 g/mol
 VOC Content (%): 99.9000015258789
 Liquid Density: 1.13 g/cm3
 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

May be harmful if inhaled.

Eye contact

Direct contact with eyes may cause temporary irritation.

Skin Contact

Prolonged contact may cause redness and irritation.

Ingestion

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

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

75-12-7	(Rat)		
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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 Not classified.
Serious eye damage/eye irritation Not classified.
Sensitization Not classified.
Germ cell mutagenicity Not classified.
Carcinogenicity This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.

Reproductive toxicity May damage fertility or the unborn child.
STOT - single exposure Not classified.
STOT - repeated exposure Not classified.
Aspiration hazard Not classified.
Other adverse effects No information available.

Numerical measures of toxicity - Product Information

Unknown acute toxicity 99.9 % of the mixture consists of ingredient(s) of unknown toxicity

12. ECOLOGICAL INFORMATION

Ecotoxicity

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

Not a PBT or vPvB substance or mixture.

Bioaccumulation

Chemical name	Partition coefficient
Formamide 75-12-7	-0.82

Mobility

No data available.

Other adverse effects

No data 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

<u>DOT</u>	Not regulated
<u>TDG</u>	Not regulated
<u>MEX</u>	Not regulated
<u>ICAO (air)</u>	Not regulated
<u>IATA</u>	Not regulated
<u>IMDG</u>	Not regulated
<u>RID</u>	Not regulated
<u>ADR</u>	Not regulated
<u>ADN</u>	Not regulated

15. REGULATORY INFORMATION

International Inventories

TSCA	Complies
DSL/NDSL	Does not comply
EINECS/ELINCS	Does not comply
ENCS	Does not comply
IECSC	Complies
KECL	Does not comply
PICCS	Complies
AICS	Complies

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

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	Yes
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

NFPA	Health hazards 2	Flammability 1	Instability 0	Physical and Chemical Properties -
HMIS	Health hazards 2	Flammability 1	Physical hazards 0	Personal protection X

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 Not applicable.

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End of Safety Data Sheet