

SAFETY DATA SHEET



Multiple Heart-Cutting Starter Kit, Part Number G4242-68000

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

1.1 Product identifier

Product name : Multiple Heart-Cutting Starter Kit, Part Number G4242-68000
CAS number : Formic Acid 64-18-6
 2D-LC Solution Not applicable.
Part no. (chemical kit) : G4242-68000
Part no. : Formic Acid G2453-85060
 2D-LC Solution 5190-6895

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

Identified uses : Reagents and Standards for Analytical Chemistry Laboratory Use
 Formic Acid 5 mL
 2D-LC Solution 1 x 2 mL
Uses advised against : None known.

1.3 Details of the supplier of the safety data sheet

Agilent Technologies Deutschland GmbH
 Hewlett-Packard-Str. 8
 76337 Waldbronn
 Germany
 0800 603 1000
e-mail address of person responsible for this SDS : pdl-msds_author@agilent.com

1.4 Emergency telephone number

Emergency telephone number (with hours of operation) : CHEMTREC®: +(44)-870-8200418

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Formic Acid Mono-constituent substance
 2D-LC Solution Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Formic Acid

H314 SKIN CORROSION/IRRITATION Category 1A
 H318 SERIOUS EYE DAMAGE/EYE IRRITATION Category 1

2D-LC Solution

H225 FLAMMABLE LIQUIDS Category 2
 H302 ACUTE TOXICITY (oral) Category 4
 H312 ACUTE TOXICITY (dermal) Category 4
 H332 ACUTE TOXICITY (inhalation) Category 4
 H319 SERIOUS EYE DAMAGE/EYE IRRITATION Category 2
 H336 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE Category 3
 (Narcotic effects)
 H400 SHORT-TERM (ACUTE) AQUATIC HAZARD Category 1
 H410 LONG-TERM (CHRONIC) AQUATIC HAZARD Category 1





Formic Acid The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.
 2D-LC Solution The product is classified as hazardous according to Regulation (EC) 1272/2008 as amended.

SECTION 2: Hazards identification

See Section 16 for the full text of the H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard pictograms	: Formic Acid 2D-LC Solution	   
Signal word	: Formic Acid 2D-LC Solution	Danger Danger
Hazard statements	: Formic Acid 2D-LC Solution	H314 - Causes severe skin burns and eye damage. H225 - Highly flammable liquid and vapour. H302 + H312 + H332 - Harmful if swallowed, in contact with skin or if inhaled. H319 - Causes serious eye irritation. H336 - May cause drowsiness or dizziness. H410 - Very toxic to aquatic life with long lasting effects.
<u>Precautionary statements</u>		
Prevention	: Formic Acid 2D-LC Solution	P280 - Wear protective gloves, protective clothing and eye or face protection. P280 - Wear protective gloves and protective clothing. Wear eye or face protection. P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P273 - Avoid release to the environment.
Response	: Formic Acid 2D-LC Solution	P304 + P310 - IF INHALED: Immediately call a POISON CENTER or doctor. P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor. P303 + P361 + P353, P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Immediately call a POISON CENTER or doctor. P391 - Collect spillage.
Storage	: Formic Acid 2D-LC Solution	Not applicable. P403 + P233 - Store in a well-ventilated place. Keep container tightly closed.
Disposal	: Formic Acid 2D-LC Solution	P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations. P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazardous ingredients	: 2D-LC Solution	- acetonitrile - acetone
Supplemental label elements	: Formic Acid 2D-LC Solution	Not applicable. Contains atrazine (ISO), metazachlor (ISO) and desethylterbutylazine. May produce an allergic reaction.
Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles	: Formic Acid 2D-LC Solution	Not applicable. Not applicable.
<u>Special packaging requirements</u>		

Multiple Heart-Cutting Starter Kit, Part Number G4242-68000

SECTION 2: Hazards identification

Tactile warning of danger : Formic Acid Not applicable.
2D-LC Solution Not applicable.

2.3 Other hazards

Product meets the criteria for PBT or vPvB according to Regulation (EC) No. 1907/2006, Annex XIII :

	PBT	P	B	T	vPvB	vP	vB
Formic Acid							
No	N/A	N/A	No		N/A	N/A	N/A

2D-LC Solution

This mixture does not contain any substances that are assessed to be a PBT or a vPvB.

Other hazards which do not result in classification : Formic Acid
2D-LC Solution

Causes severe digestive tract burns.
None known.

SECTION 3: Composition/information on ingredients

3.1 Substances : Formic Acid Mono-constituent substance
2D-LC Solution Mixture

Product/ingredient name	Identifiers	%	Classification	Specific Conc. Limits, M-factors and ATEs	Type
Formic Acid formic acid	EC: 200-579-1 CAS: 64-18-6 Index: 607-001-00-0	100	Skin Corr. 1A, H314 Eye Dam. 1, H318	Skin Corr. 1A, H314: C ≥ 90% Skin Corr. 1B, H314: 10% ≤ C < 90% Skin Irrit. 2, H315: 2% ≤ C < 10% Eye Dam. 1, H318: C ≥ 10% Eye Irrit. 2, H319: 2% ≤ C < 10%	[1]
2D-LC Solution acetonitrile	EC: 200-835-2 CAS: 75-05-8 Index: 608-001-00-3	≥50 - ≤75	Flam. Liq. 2, H225 Acute Tox. 4, H302 Acute Tox. 4, H312 Acute Tox. 4, H332 Eye Irrit. 2, H319	ATE [Oral] = 500 mg/kg ATE [Dermal] = 1100 mg/kg ATE [Inhalation (vapours)] = 11 mg/l	[1] [2]
acetone	EC: 200-662-2 CAS: 67-64-1 Index: 606-001-00-8	≥10 - ≤25	Flam. Liq. 2, H225 Eye Irrit. 2, H319 STOT SE 3, H336 EUH066	-	[1] [2]
atrazine (ISO)	EC: 217-617-8 CAS: 1912-24-9 Index: 613-068-00-7	≤0.3	Skin Sens. 1, H317 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	M [Acute] = 100 M [Chronic] = 100	[1] [2]
1,3,5-Triazine-2,4-diamine, 6-chloro-N(sup 2)-(1-methylethyl)-	CAS: 6190-65-4	≤0.3	Acute Tox. 4, H302 Acute Tox. 4, H332 Eye Irrit. 2, H319 Aquatic Acute 1, H400 Aquatic Chronic 1,	ATE [Oral] = 500 mg/kg ATE [Inhalation (vapours)] = 11 mg/l M [Acute] = 1	[1]

SECTION 3: Composition/information on ingredients

chlorotoluron (ISO)	EC: 239-592-2 CAS: 15545-48-9 Index: 616-105-00-5	≤0.3	H410 Carc. 2, H351 Repr. 2, H361d Aquatic Acute 1, H400 Aquatic Chronic 1, H410	M [Chronic] = 1 M [Acute] = 10 M [Chronic] = 10	[1]
diuron (ISO)	EC: 206-354-4 CAS: 330-54-1 Index: 006-015-00-9	≤0.3	Acute Tox. 4, H302 Carc. 2, H351 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	ATE [Oral] = 1000 mg/kg M [Acute] = 10 M [Chronic] = 10	[1] [2]
hexazinone (ISO)	EC: 257-074-4 CAS: 51235-04-2 Index: 613-132-00-4	≤0.3	Acute Tox. 4, H302 Eye Irrit. 2, H319 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	ATE [Oral] = 1690 mg/kg M [Acute] = 100 M [Chronic] = 100	[1]
linuron (ISO)	EC: 206-356-5 CAS: 330-55-2 Index: 006-021-00-1	<0.3	Acute Tox. 4, H302 Carc. 2, H351 Repr. 1B, H360Df STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	ATE [Oral] = 1146 mg/kg M [Acute] = 100 M [Chronic] = 100	[1]
metazachlor (ISO)	EC: 266-583-0 CAS: 67129-08-2 Index: 616-205-00-9	≤0.3	Skin Sens. 1B, H317 Carc. 2, H351 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	M [Acute] = 100 M [Chronic] = 100	[1]
methabenzthiazuron (ISO)	EC: 242-505-0 CAS: 18691-97-9 Index: 613-137-00-1	≤0.3	Aquatic Acute 1, H400 Aquatic Chronic 1, H410	M [Acute] = 10 M [Chronic] = 10	[1]
metoxuron (ISO)	EC: 243-433-2 CAS: 19937-59-8 Index: 006-033-00-7	≤0.3	Aquatic Acute 1, H400 Aquatic Chronic 1, H410	M [Acute] = 1 M [Chronic] = 1	[1]
prometryn	EC: 230-711-3 CAS: 7287-19-6	≤0.3	Acute Tox. 4, H302 Eye Irrit. 2, H319 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	ATE [Oral] = 1802 mg/kg M [Acute] = 100 M [Chronic] = 100	[1]
terbutylazine (ISO)	EC: 227-637-9 CAS: 5915-41-3 Index: 613-323-00-2	≤0.3	Acute Tox. 4, H302 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	ATE [Oral] = 1845 mg/kg M [Acute] = 10 M [Chronic] = 10	[1]
desethylterbutylazine	CAS: 30125-63-4	≤0.3	Skin Sens. 1, H317 Aquatic Chronic 1, H410 See Section 16 for the full text of the H statements declared above.	M [Chronic] = 10	[1]

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

SECTION 3: Composition/information on ingredients

Type	
Formic Acid	[1] Constituent
2D-LC Solution	[1] Substance classified with a health or environmental hazard [2] Substance with a workplace exposure limit

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact	: Formic Acid	Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
	2D-LC Solution	Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
Inhalation	: Formic Acid	Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	2D-LC Solution	Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Skin contact	: Formic Acid	Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.
	2D-LC Solution	Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention if adverse health effects persist or are severe. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

SECTION 4: First aid measures

Ingestion	: Formic Acid	Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
	2D-LC Solution	Wash out mouth with water. Remove dentures if any. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. If necessary, call a poison center or physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
Protection of first-aiders	: Formic Acid	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
	2D-LC Solution	No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

Eye contact	: Formic Acid 2D-LC Solution	Causes serious eye damage. Causes serious eye irritation.
Inhalation	: Formic Acid 2D-LC Solution	No known significant effects or critical hazards. Harmful if inhaled. Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness.
Skin contact	: Formic Acid 2D-LC Solution	Causes severe burns. Harmful in contact with skin.
Ingestion	: Formic Acid 2D-LC Solution	Severely corrosive to the digestive tract. Causes severe burns. Harmful if swallowed. Can cause central nervous system (CNS) depression.

Over-exposure signs/symptoms

Eye contact	: Formic Acid	Adverse symptoms may include the following: pain watering redness
	2D-LC Solution	Adverse symptoms may include the following: pain or irritation watering

SECTION 4: First aid measures

Inhalation	: Formic Acid 2D-LC Solution	redness No specific data. Adverse symptoms may include the following: nausea or vomiting headache drowsiness/fatigue dizziness/vertigo unconsciousness
Skin contact	: Formic Acid 2D-LC Solution	Adverse symptoms may include the following: pain or irritation redness blistering may occur No specific data.
Ingestion	: Formic Acid 2D-LC Solution	Adverse symptoms may include the following: stomach pains No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician	: Formic Acid 2D-LC Solution	Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
Specific treatments	: Formic Acid 2D-LC Solution	No specific treatment. No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	: Formic Acid 2D-LC Solution	Use an extinguishing agent suitable for the surrounding fire. Use dry chemical, CO ₂ , water spray (fog) or foam.
Unsuitable extinguishing media	: Formic Acid 2D-LC Solution	None known. Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture	: Formic Acid 2D-LC Solution	In a fire or if heated, a pressure increase will occur and the container may burst. Highly flammable liquid and vapour. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. This material is very toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
Hazardous combustion products	: Formic Acid 2D-LC Solution	Decomposition products may include the following materials: carbon dioxide carbon monoxide Decomposition products may include the following materials: carbon dioxide carbon monoxide nitrogen oxides cyanides

5.3 Advice for firefighters

SECTION 5: Firefighting measures

Special precautions for fire-fighters	: Formic Acid	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
	2D-LC Solution	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.
Special protective equipment for fire-fighters	: Formic Acid	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.
	2D-LC Solution	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	: Formic Acid	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
	2D-LC Solution	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
For emergency responders	: Formic Acid	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
	2D-LC Solution	If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
6.2 Environmental precautions	: Formic Acid	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
	2D-LC Solution	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

6.3 Methods and material for containment and cleaning up

SECTION 6: Accidental release measures

Methods for cleaning up	: Formic Acid	Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
	2D-LC Solution	Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
6.4 Reference to other sections	: See Section 1 for emergency contact information. See Section 8 for information on appropriate personal protective equipment. See Section 13 for additional waste treatment information.	

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Protective measures	: Formic Acid	Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapour or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.
	2D-LC Solution	Put on appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing vapour or mist. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.
Advice on general occupational hygiene	: Formic Acid	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
	2D-LC Solution	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

SECTION 7: Handling and storage

Storage

: Formic Acid

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

2D-LC Solution

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidising materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabelled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Seveso Directive - Reporting thresholds

Danger criteria

Category	Notification and MAPP threshold	Safety report threshold
2D-LC Solution P5c E1	5000 tonne 100 tonne	50000 tonne 200 tonne

7.3 Specific end use(s)

Recommendations

: Formic Acid
2D-LC Solution

Industrial applications, Professional applications.
Industrial applications, Professional applications.

Industrial sector specific solutions

: Formic Acid
2D-LC Solution

Not available.
Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Formic Acid formic acid	NAOSH (Ireland, 5/2021). Notes: EU derived Occupational Exposure Limit Values OELV: 5 ppm 8 hours. OELV: 9 mg/m ³ 8 hours.
2D-LC Solution acetonitrile	NAOSH (Ireland, 5/2021). Absorbed through skin. Notes: EU derived Occupational Exposure Limit Values OELV: 40 ppm 8 hours. OELV: 70 mg/m ³ 8 hours.
acetone	NAOSH (Ireland, 5/2021). Notes: EU derived Occupational Exposure Limit Values OELV: 500 ppm 8 hours. OELV: 1210 mg/m ³ 8 hours.
atrazine (ISO)	NAOSH (Ireland, 5/2021). Skin sensitiser. Inhalation sensitiser. Notes: Advisory Occupational Exposure Limit Values (OELVs)

SECTION 8: Exposure controls/personal protection

diuron (ISO)	OELV: 2 mg/m ³ 8 hours. NAOSH (Ireland, 5/2021). Notes: Advisory Occupational Exposure Limit Values (OELVs) OELV: 10 mg/m ³ 8 hours.
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Biological exposure indices

Product/ingredient name	Exposure indices
2D-LC Solution acetone	NAOSH (Ireland, 1/2011) BMGV: 50 mg/l, acetone [in urine]. Sampling time: end of shift - As soon as possible after exposure ceases.

Recommended monitoring procedures : Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

DNELs/DMELs

Product/ingredient name	Type	Exposure	Value	Population	Effects
Formic Acid formic acid	DNEL	Long term Inhalation	3 mg/m ³	General population	Local
	DNEL	Long term Inhalation	9.5 mg/m ³	Workers	Local
2D-LC Solution acetonitrile	DNEL	Long term Oral	0.4 mg/kg bw/day	General population	Systemic
	DNEL	Short term Oral	0.6 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	1.2 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	2.4 mg/m ³	General population	Systemic
acetone	DNEL	Long term Oral	62 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	62 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	186 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	200 mg/m ³	General population	Systemic
	DNEL	Long term Inhalation	1210 mg/m ³	Workers	Systemic
diuron (ISO)	DNEL	Short term Inhalation	2420 mg/m ³	Workers	Local
	DNEL	Long term Inhalation	0.17 mg/m ³	Workers	Systemic
prometryn	DNEL	Long term Dermal	5.79 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Oral	0.12 mg/kg bw/day	General population	Systemic
	DNEL	Long term Dermal	0.22 mg/kg bw/day	General population	Systemic
	DNEL	Long term Inhalation	0.38 mg/m ³	General population	Systemic
	DNEL	Long term Dermal	0.62 mg/kg	Workers	Systemic

SECTION 8: Exposure controls/personal protection

	DNEL	Long term Inhalation	bw/day 2.22 mg/m ³	Workers	Systemic
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PNECs

No PNECs available

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Skin protection

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9: Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

9.1 Information on basic physical and chemical properties

Appearance

Physical state	: Formic Acid 2D-LC Solution	Liquid. [Clear.] Liquid.
Colour	: Formic Acid 2D-LC Solution	Colourless. Not available.
Odour	: Formic Acid 2D-LC Solution	Pungent. Not available.
Odour threshold	: Formic Acid 2D-LC Solution	Not available. Not available.

SECTION 9: Physical and chemical properties

Melting point/freezing point	: Formic Acid	4°C [OECD 102]
	: 2D-LC Solution	Not available.
Initial boiling point and boiling range	: Formic Acid	100.23°C [OECD 103]
	: 2D-LC Solution	Not available.
Flammability	: Formic Acid	Not applicable.
	: 2D-LC Solution	Not applicable.
Upper/lower flammability or explosive limits	: Formic Acid	Lower: 18%
		Upper: 51%
	: 2D-LC Solution	Not available.
Flash point	: Formic Acid	Closed cup: 49.5°C [DIN EN ISO 13736]
	: 2D-LC Solution	Closed cup: -18 to 23°C
Auto-ignition temperature	: Formic Acid	434°C

Ingredient name	°C	Method
2D-LC Solution		
acetone	465	-
acetonitrile	524	-

Decomposition temperature	: Formic Acid	150 to 300°C
	: 2D-LC Solution	Not available.
pH	: Formic Acid	Not available.
	: 2D-LC Solution	Not available.
Viscosity	: Formic Acid	Dynamic (room temperature): 1.22 mPa·s [OECD 114] Kinematic (room temperature): 1.47 mm ² /s [OECD 114] Kinematic (40°C): 1.02 mm ² /s [OECD 114]
	: 2D-LC Solution	Not available.

Solubility(ies)	Media	Result
	Formic Acid	
	methanol	Soluble
	diethyl ether	Soluble
	acetone	Soluble
	water	Soluble
	2D-LC Solution	
	water	Soluble

Partition coefficient: n-octanol/water	: Formic Acid	-2.3 [OECD 107]
	: 2D-LC Solution	Not applicable.
Vapour pressure	: Formic Acid	4.3 kPa (32.03522 mm Hg) [room temperature] [EU A.4] 17.4 kPa (130.51 mm Hg) [50°C]

Ingredient name	Vapour Pressure at 20°C			Vapour pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
2D-LC Solution						
acetone	180.01463	24	-	-	-	-
acetonitrile	70.88853	9.5	-	-	-	-

Evaporation rate	: Formic Acid	1.14 (butyl acetate = 1)
	: 2D-LC Solution	Not available.
Relative density	: Formic Acid	1.2
	: 2D-LC Solution	Not available.
Vapour density	: Formic Acid	1.6 [Air = 1]
	: 2D-LC Solution	Not available.
Explosive properties	: Formic Acid	Slightly explosive in the presence of the following materials or conditions: oxidising materials.
	: 2D-LC Solution	Not available.

SECTION 9: Physical and chemical properties

Oxidising properties : Formic Acid Not available.
2D-LC Solution Not available.

Particle characteristics

Median particle size : Formic Acid Not applicable.
2D-LC Solution Not applicable.

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity : Formic Acid No specific test data related to reactivity available for this product or its ingredients.
2D-LC Solution No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : Formic Acid The product is stable.
2D-LC Solution The product is stable.

10.3 Possibility of hazardous reactions : Formic Acid Under normal conditions of storage and use, hazardous reactions will not occur.
2D-LC Solution Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid : Formic Acid No specific data.
2D-LC Solution Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials : Formic Acid May react or be incompatible with oxidising materials.
2D-LC Solution Reactive or incompatible with the following materials:
oxidising materials

10.6 Hazardous decomposition products : Formic Acid Under normal conditions of storage and use, hazardous decomposition products should not be produced.
2D-LC Solution Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Formic Acid formic acid	LC50 Inhalation Vapour	Rat	7400 mg/m ³	4 hours
	LD50 Oral	Rat	730 mg/kg	-
2D-LC Solution acetonitrile	LC50 Inhalation Vapour	Rat	17100 ppm	4 hours
	LD50 Oral	Rat	2460 mg/kg	-
acetone	LD50 Oral	Rat	5800 mg/kg	-
atrazine (ISO)	LC50 Inhalation Dusts and mists	Rat	5200 mg/m ³	4 hours
	LD50 Dermal	Rabbit	7500 mg/kg	-
chlorotoluron (ISO)	LD50 Dermal	Rat	3 g/kg	-
	LD50 Oral	Rat	672 mg/kg	-
diuron (ISO)	LD50 Oral	Rat	5800 mg/kg	-
	LC50 Inhalation Dusts and mists	Rat - Male, Female	>5.05 mg/l	4 hours
	LD50 Dermal	Rat	>5 g/kg	-
	LD50 Oral	Rat	1 g/kg	-

SECTION 11: Toxicological information

hexazinone (ISO)	LD50 Dermal	Rabbit	>5278 mg/kg	-
	LD50 Dermal	Rat	5278 mg/kg	-
	LD50 Oral	Rat	1690 mg/kg	-
linuron (ISO)	LC50 Inhalation Dusts and mists	Rat	48 mg/m ³	4 hours
	LD50 Dermal	Rabbit	>5 g/kg	-
	LD50 Oral	Rat	1146 mg/kg	-
metazachlor (ISO)	LD50 Dermal	Rat	>6810 mg/kg	-
	LD50 Oral	Rat	1 g/kg	-
metoxuron (ISO)	LD50 Oral	Rat	1600 mg/kg	-
prometryn	LD50 Oral	Rat	1802 mg/kg	-
terbuthylazine (ISO)	LC50 Inhalation Dusts and mists	Rat	>5.3 mg/l	4 hours
	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat	1845 mg/kg	-

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapours) (mg/l)	Inhalation (dusts and mists) (mg/l)
2D-LC Solution					
2D-LC Solution	680.0	1496.0	N/A	15.0	N/A
acetonitrile	500	1100	N/A	11	N/A
acetone	5800	20000	N/A	76	N/A
atrazine (ISO)	N/A	3000	N/A	N/A	5.2
1,3,5-Triazine-2,4-diamine, 6-chloro-N(sup 2)-(1-methylethyl)-	500	N/A	N/A	11	N/A
chlorotoluron (ISO)	5800	N/A	N/A	N/A	N/A
diuron (ISO)	1000	N/A	N/A	N/A	N/A
hexazinone (ISO)	1690	5278	N/A	N/A	N/A
linuron (ISO)	1146	N/A	N/A	N/A	N/A
prometryn	1802	N/A	N/A	N/A	N/A
terbuthylazine (ISO)	1845	N/A	N/A	N/A	N/A

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Formic Acid					
formic acid	Eyes - Severe irritant	Rabbit	-	122 mg	-
2D-LC Solution					
acetonitrile	Eyes - Moderate irritant	Rabbit	-	24 hours 100 uL	-
acetone	Eyes - Mild irritant	Rabbit	-	10 uL	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 20 mg	-
	Skin - Mild irritant	Rabbit	-	395 mg	-
	Skin - Mild irritant	Rabbit	-	24 hours 500 mg	-
atrazine (ISO)	Eyes - Severe irritant	Rabbit	-	6320 ug	-
	Skin - Mild irritant	Rabbit	-	38 mg	-
hexazinone (ISO)	Eyes - Moderate irritant	Rabbit	-	48 mg	-
prometryn	Eyes - Mild irritant	Rabbit	-	80 mg	-

Sensitiser

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

SECTION 11: Toxicological information

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Product/ingredient name	Category	Route of exposure	Target organs
2D-LC Solution acetone	Category 3	-	Narcotic effects

Specific target organ toxicity (repeated exposure)

Product/ingredient name	Category	Route of exposure	Target organs
2D-LC Solution atrazine (ISO)	Category 2	-	-
diuron (ISO)	Category 2	-	-
linuron (ISO)	Category 2	-	-
terbuthylazine (ISO)	Category 2	-	-

Aspiration hazard

Not available.

Information on likely routes of exposure : Formic Acid Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.
2D-LC Solution Routes of entry anticipated: Oral, Dermal, Inhalation, Eyes.

Potential acute health effects

Inhalation : Formic Acid No known significant effects or critical hazards.
2D-LC Solution Harmful if inhaled. Can cause central nervous system (CNS) depression. May cause drowsiness or dizziness.

Ingestion : Formic Acid Severely corrosive to the digestive tract. Causes severe burns.
2D-LC Solution Harmful if swallowed. Can cause central nervous system (CNS) depression.

Skin contact : Formic Acid Causes severe burns.
2D-LC Solution Harmful in contact with skin.

Eye contact : Formic Acid Causes serious eye damage.
2D-LC Solution Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : Formic Acid No specific data.
2D-LC Solution Adverse symptoms may include the following:
nausea or vomiting
headache
drowsiness/fatigue
dizziness/vertigo
unconsciousness

Ingestion : Formic Acid Adverse symptoms may include the following:
stomach pains
2D-LC Solution No specific data.

Skin contact : Formic Acid Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
2D-LC Solution No specific data.

Eye contact : Formic Acid Adverse symptoms may include the following:
pain
watering
redness
2D-LC Solution Adverse symptoms may include the following:
pain or irritation
watering
redness

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

Short term exposure

SECTION 11: Toxicological information

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Conclusion/Summary : Not available.

General : Formic Acid 2D-LC Solution No known significant effects or critical hazards.
2D-LC Solution No known significant effects or critical hazards.

Carcinogenicity : Formic Acid 2D-LC Solution No known significant effects or critical hazards.
2D-LC Solution No known significant effects or critical hazards.

Mutagenicity : Formic Acid 2D-LC Solution No known significant effects or critical hazards.
2D-LC Solution No known significant effects or critical hazards.

Reproductive toxicity : Formic Acid 2D-LC Solution No known significant effects or critical hazards.
2D-LC Solution No known significant effects or critical hazards.

11.2 Information on other hazards

11.2.1 Endocrine disrupting properties

Not available.

11.2.2 Other information

2D-LC Solution Adverse symptoms may include the following: May cause skin sensitisation.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Result	Species	Exposure
Formic Acid formic acid	Acute EC50 151200 µg/l Fresh water	Daphnia - <i>Daphnia magna</i> - Larvae	48 hours
	Acute LC50 80000 to 90000 µg/l Marine water	Crustaceans - <i>Carcinus maenas</i> - Adult	48 hours
	Acute NOEC ≥100 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	21 days
2D-LC Solution acetonitrile	Acute IC50 3685000 µg/l Fresh water	Aquatic plants - <i>Lemna minor</i>	96 hours
	Acute LC50 3600000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 1000000 µg/l Fresh water	Fish - <i>Pimephales promelas</i>	96 hours
	Chronic NOEC 1000000 µg/l Fresh water	Aquatic plants - <i>Lemna minor</i>	96 hours
	acetone	Chronic NOEC 160000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>
Acute EC50 7200000 µg/l Fresh water		Algae - <i>Selenastrum sp.</i>	96 hours
Acute LC50 4.42589 ml/L Marine water		Crustaceans - <i>Acartia tonsa</i> - Copepodid	48 hours
Acute LC50 7460000 µg/l Fresh water		Daphnia - <i>Daphnia cucullata</i>	48 hours
Acute LC50 5600 ppm Fresh water		Fish - <i>Poecilia reticulata</i>	96 hours
Chronic NOEC 4.95 mg/l Marine water		Algae - <i>Ulva pertusa</i>	96 hours
Chronic NOEC 0.016 ml/L Fresh water		Crustaceans - <i>Daphniidae</i>	21 days
atrazine (ISO)	Chronic NOEC 0.1 ml/L Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	21 days
	Acute EC50 4.3 µg/l Fresh water	Algae - <i>Chlorella vulgaris</i>	96 hours
	Acute EC50 11 µg/l Fresh water	Algae - <i>Scenedesmus acutus</i>	72 hours
	Acute EC50 0.0405 mg/l Fresh water	Aquatic plants - <i>Lemna minor</i>	96 hours
	Acute EC50 240 µg/l Fresh water	Daphnia - <i>Daphnia pulex</i>	48 hours
Acute IC50 13.4 µg/l Marine water	Aquatic plants - <i>Zostera muelleri</i>	72 hours	

SECTION 12: Ecological information

	Acute LC50 373.9 µg/l Marine water	Crustaceans - <i>Acartia tonsa</i> - Adult	48 hours
	Acute LC50 1.25 ppm Fresh water	Fish - <i>Barbodes carnaticus</i>	96 hours
	Chronic IC10 1.17 µg/l Marine water	Aquatic plants - <i>Zostera muelleri</i>	72 hours
	Chronic NOEC 0.002 mg/l Fresh water	Algae - <i>Scenedesmus acutus</i> var. <i>acutus</i> - Exponential growth phase	3 days
	Chronic NOEC 25 µg/l Fresh water	Crustaceans - <i>Ceriodaphnia</i> sp.	21 days
	Chronic NOEC 3 mg/l Fresh water	Daphnia - <i>Daphnia magna</i>	21 days
	Chronic NOEC 0.26 ppb Fresh water	Fish - <i>Poecilia reticulata</i> - Adult	16 weeks
	Acute EC50 821 µg/l Fresh water	Algae - <i>Chlorella fusca</i> ssp. <i>fusca</i> - Exponential growth phase	96 hours
1,3,5-Triazine-2,4-diamine, 6-chloro-N(sup 2)-(1-methylethyl)-chlorotoluron (ISO)	Acute EC50 0.018 mg/l Fresh water	Algae - <i>Scenedesmus quadricauda</i>	96 hours
	Acute LC50 35 ppm Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
	Chronic NOEC 10 µg/l Fresh water	Algae - <i>Chlorella pyrenoidosa</i> - Exponential growth phase	96 hours
diuron (ISO)	Acute EC50 0.0013 mg/l Fresh water	Algae - <i>Chlorella pyrenoidosa</i>	96 hours
	Acute EC50 2.26 µg/l Marine water	Algae - <i>Coccolithus huxleyi</i> - Exponential growth phase	72 hours
	Acute EC50 0.005 mg/l Fresh water	Aquatic plants - <i>Lemna</i> sp.	96 hours
	Acute EC50 7.2 mg/l Fresh water	Daphnia - <i>Daphnia magna</i> - Neonate	48 hours
	Acute IC50 2.41 µg/l Marine water	Aquatic plants - <i>Halodule uninervis</i>	72 hours
	Acute LC50 380 µg/l Fresh water	Crustaceans - <i>Gammarus lacustris</i>	48 hours
	Acute LC50 500 µg/l Fresh water	Fish - <i>Morone saxatilis</i> - Larvae	96 hours
	Chronic EC10 0.11 µg/l Fresh water	Algae - <i>Fragilaria capucina</i> - Exponential growth phase	96 hours
	Chronic NOEC 0.34 µg/l Marine water	Aquatic plants - <i>Zostera muelleri</i>	72 hours
	Chronic NOEC 26.4 ppb	Fish - <i>Pimephales promelas</i>	60 days
hexazinone (ISO)	Acute EC50 0.073 mg/l Fresh water	Aquatic plants - <i>Lemna</i> sp.	96 hours
	Acute EC50 85 ppm Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute IC50 4.4 µg/l Marine water	Aquatic plants - <i>Zostera muelleri</i>	72 hours
	Acute LC50 71.6 mg/l Fresh water	Crustaceans - <i>Pacifastacus leniusculus</i> - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	Acute LC50 146.7 ppm Fresh water	Fish - <i>Oncorhynchus mykiss</i>	96 hours
	Chronic NOEC 0.37 µg/l Marine water	Aquatic plants - <i>Halodule uninervis</i>	72 hours
	Chronic NOEC 0.1 mg/l Fresh water	Crustaceans - <i>Copepoda</i>	21 days
	Chronic NOEC 20 ppm Fresh water	Daphnia - <i>Daphnia magna</i>	21 days
	Chronic NOEC 85.5 µg/l Fresh water	Fish - <i>Salmo salar</i> - Yolk-sac larvae	396 days
linuron (ISO)	Acute EC50 6 µg/l Fresh water	Algae - <i>Scenedesmus acutus</i>	3 days
	Acute EC50 0.12 ppm Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 0.89 ppm Marine water	Fish - <i>Cyprinodon variegatus</i>	96 hours
	Chronic EC10 1.2 µg/l Fresh water	Algae - <i>Scenedesmus acutus</i>	3 days
	Chronic NOEC 4.3 to 5.1 µg/l Fresh water	Crustaceans - <i>Crustacea</i>	21 days
	Chronic NOEC 0.13 ppm Fresh water	Daphnia - <i>Daphnia magna</i>	21 days
	Chronic NOEC 1 µg/l Fresh water	Fish - <i>Pimephales promelas</i> - Adult	28 days
metazachlor (ISO)	Acute EC50 0.647 mg/l	Algae - <i>Prorocentrum minimum</i> - Exponential growth phase	72 hours
	Chronic NOEC 0.01 mg/l	Algae - <i>Prorocentrum minimum</i> - Exponential growth phase	72 hours
methabenzthiazuron (ISO)	Acute EC50 0.033 mg/l Fresh water	Algae - <i>Scenedesmus quadricauda</i>	96 hours
metoxuron (ISO)	Acute LC50 122000 µg/l Fresh water	Crustaceans - <i>Cyclops strenuus</i>	48 hours
	Acute LC50 160000 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours

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prometryn	Acute LC50 40 mg/l Fresh water	Fish - <i>Rasbora heteromorpha</i>	96 hours
	Acute EC50 0.00165 mg/l Fresh water	Algae - <i>Scenedesmus acutus</i> <i>var. acutus</i>	96 hours
	Acute EC50 9700 µg/l Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 17 mg/l Fresh water	Crustaceans - <i>Pacifastacus leniusculus</i> - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
terbutylazine (ISO)	Acute LC50 2300 µg/l Fresh water	Fish - <i>Danio rerio</i> - Larvae	96 hours
	Chronic NOEC 2.5 µg/l Fresh water	Algae - <i>Chlamydomonas reinhardtii</i>	4 days
	Chronic NOEC 1 ppm Fresh water	Daphnia - <i>Daphnia magna</i>	21 days
	Chronic NOEC 0.51 µg/l Fresh water	Fish - <i>Carassius sp.</i> - Juvenile (Fledgling, Hatchling, Weanling)	60 days
	Acute EC50 0.016 mg/l Fresh water	Algae - <i>Desmodesmus subspicatus</i> - Exponential growth phase	72 hours
	Acute EC50 100 to 150 µg/l Fresh water	Aquatic plants - <i>Lemna minor</i>	3 days
desethylterbutylazine	Acute EC50 21.2 ppm Fresh water	Daphnia - <i>Daphnia magna</i>	48 hours
	Acute LC50 1.6 ppm Fresh water	Fish - <i>Poecilia reticulata</i>	96 hours
	Chronic NOEC 5 µg/l Marine water	Algae - <i>Skeletonema marinoi</i>	4 days
	Chronic NOEC 820 µg/l Fresh water	Fish - <i>Cyprinus carpio</i> - Embryo	30 days
	Chronic NOEC 1.8 µg/l Fresh water	Fish - <i>Cyprinus carpio</i> - Egg	36 days

12.2 Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
2D-LC Solution acetonitrile	OECD 310 Ready Biodegradability - CO2 in Sealed Vessels (Headspace Test)	70 % - Readily - 21 days	-	Activated sludge
atrazine (ISO)	-	9.86 % - Not readily - 28 days	-	-
diuron (ISO)	OECD 301F Ready Biodegradability - Manometric Respirometry Test	0 % - Not readily - 28 days	-	-

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Formic Acid formic acid	-	-	Readily
2D-LC Solution acetonitrile	-	-	Readily
acetone	-	-	Readily
atrazine (ISO)	-	-	Not readily
diuron (ISO)	-	-	Not readily

12.3 Bioaccumulative potential

SECTION 12: Ecological information

Product/ingredient name	LogP _{ow}	BCF	Potential
Formic Acid formic acid	-2.3	-	Low
2D-LC Solution acetonitrile	-0.34	3	Low
acetone	-0.23	3	Low
atrazine (ISO)	2.59	7.94	Low
1,3,5-Triazine-2,4-diamine, 6-chloro-N(sup 2)- (1-methylethyl)- chlorotoluron (ISO)	1.51	-	Low
diuron (ISO)	2.41	-	Low
hexazinone (ISO)	2.84	5.2	Low
linuron (ISO)	1.85	-	Low
metazachlor (ISO)	3.2	17.78	Low
methabenzthiazuron (ISO)	2.13	-	Low
metoxuron (ISO)	2.64	-	Low
prometryn	1.64	-	Low
terbutylazine (ISO)	3.51	-	Low
	3.21	-	Low

12.4 Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Mobility : Not available.

12.5 Results of PBT and vPvB assessment

Product/ingredient name	PBT	P	B	T	vPvB	vP	vB
Formic Acid formic acid	No	N/A	N/A	No	N/A	N/A	N/A

12.6 Endocrine disrupting properties

Not available.

12.7 Other adverse effects

No known significant effects or critical hazards.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction.

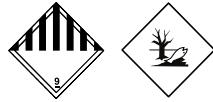
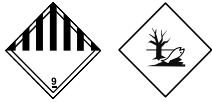

Hazardous waste : The classification of the product may meet the criteria for a hazardous waste.

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA
14.1 UN number or ID number	UN3316	UN3316	UN3316
14.2 UN proper shipping name	CHEMICAL KIT	CHEMICAL KIT	Chemical kit
14.3 Transport hazard class(es)	9 	9 	9 
14.4 Packing group	II	II	II
14.5 Environmental hazards	Yes.	Yes.	Yes. The environmentally hazardous substance mark is not required.

Additional information

- ADR/RID** : The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg.
Hazard identification number 90
Limited quantity See SP 251
Special provisions 251, 340, 671
Tunnel code (E)
- IMDG** : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.
Emergency schedules F-A, _S-P_
Special provisions 251, 340
- IATA** : The environmentally hazardous substance mark may appear if required by other transportation regulations.
Quantity limitation Passenger and Cargo Aircraft: 10 kg. Packaging instructions: 960. Cargo Aircraft Only: 10 kg. Packaging instructions: 960. Limited Quantities - Passenger Aircraft: 1 kg. Packaging instructions: Y960.
Special provisions A44, A163
- 14.6 Special precautions for user** : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.
- 14.7 Transport in bulk according to IMO instruments** : Not available.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Annex XIV

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

SECTION 15: Regulatory information

Product / Ingredient name	Identifiers	Designation [Usage]
Formic Acid formic acid		3
2D-LC Solution 2D-LC Solution		3

Label : Formic Acid Not applicable.
2D-LC Solution Not applicable.

Other EU regulations

Industrial emissions (integrated pollution prevention and control) - Air : Listed

Industrial emissions (integrated pollution prevention and control) - Water : Listed

Ozone depleting substances (1005/2009/EU)

Not listed.

Prior Informed Consent (PIC) (649/2012/EU)

Not listed.

Persistent Organic Pollutants

Not listed.

Seveso Directive

This product is controlled under the Seveso Directive.

Danger criteria

Category
2D-LC Solution P5c E1

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Not listed.

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Not listed.

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Not listed.

Inventory list

- Australia** : Not determined.
- Canada** : Not determined.
- China** : Not determined.
- Eurasian Economic Union** : **Russian Federation inventory:** All components are listed or exempted.
- Japan** : **Japan inventory (CSCL):** Not determined.
Japan inventory (ISHL): Not determined.

SECTION 15: Regulatory information

- New Zealand** : Not determined.
- Philippines** : Not determined.
- Republic of Korea** : Not determined.
- Taiwan** : Not determined.
- Thailand** : Not determined.
- Turkey** : Not determined.
- United States** : At least one component is inactive.
- Viet Nam** : Not determined.


15.2 Chemical safety assessment : This product contains substances for which Chemical Safety Assessments might still be required.

SECTION 16: Other information


 Indicates information that has changed from previously issued version.

- Abbreviations and acronyms** :
- ATE = Acute Toxicity Estimate
 - CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 - DMEL = Derived Minimal Effect Level
 - DNEL = Derived No Effect Level
 - EUH statement = CLP-specific Hazard statement
 - N/A = Not available
 - PBT = Persistent, Bioaccumulative and Toxic
 - PNEC = Predicted No Effect Concentration
 - RRN = REACH Registration Number
 - vPvB = Very Persistent and Very Bioaccumulative

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Classification	Justification
 Formic Acid Skin Corr. 1A, H314 Eye Dam. 1, H318 2D-LC Solution Flam. Liq. 2, H225 Acute Tox. 4, H302 Acute Tox. 4, H312 Acute Tox. 4, H332 Eye Irrit. 2, H319 STOT SE 3, H336 Aquatic Acute 1, H400 Aquatic Chronic 1, H410	Regulatory data Regulatory data Expert judgment Calculation method Calculation method Calculation method Calculation method Calculation method Calculation method Calculation method

Full text of abbreviated H statements

 Formic Acid H314 H318 2D-LC Solution H225 H302 H312 H317 H319 H332 H336 H351 H360Df H361d H373	Causes severe skin burns and eye damage. Causes serious eye damage. Highly flammable liquid and vapour. Harmful if swallowed. Harmful in contact with skin. May cause an allergic skin reaction. Causes serious eye irritation. Harmful if inhaled. May cause drowsiness or dizziness. Suspected of causing cancer. May damage the unborn child. Suspected of damaging fertility. Suspected of damaging the unborn child. May cause damage to organs through prolonged or repeated
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Multiple Heart-Cutting Starter Kit, Part Number G4242-68000

SECTION 16: Other information

H400 H410 EUH066	exposure. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects. Repeated exposure may cause skin dryness or cracking.
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[Full text of classifications \[CLP/GHS\]](#)

<p>Formic Acid Eye Dam. 1 Skin Corr. 1A</p> <p>2D-LC Solution Acute Tox. 4 Aquatic Acute 1 Aquatic Chronic 1 Carc. 2 Eye Irrit. 2 Flam. Liq. 2 Repr. 1B Repr. 2 Skin Sens. 1 Skin Sens. 1B STOT RE 2</p> <p>STOT SE 3</p>	<p>SERIOUS EYE DAMAGE/EYE IRRITATION - Category 1 SKIN CORROSION/IRRITATION - Category 1A</p> <p>ACUTE TOXICITY - Category 4 SHORT-TERM (ACUTE) AQUATIC HAZARD - Category 1 LONG-TERM (CHRONIC) AQUATIC HAZARD - Category 1 CARCINOGENICITY - Category 2 SERIOUS EYE DAMAGE/EYE IRRITATION - Category 2 FLAMMABLE LIQUIDS - Category 2 REPRODUCTIVE TOXICITY - Category 1B REPRODUCTIVE TOXICITY - Category 2 SKIN SENSITISATION - Category 1 SKIN SENSITISATION - Category 1B SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE - Category 2 SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE - Category 3</p>
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Date of issue/ Date of revision : 03/04/2024

Date of previous issue : 11/05/2023

Version : 2

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