



Safety Data Sheet

according to WHMIS 2023 and HCS 2024

* 1 Identification

· Product identifier

· Trade name: 415

- **Other Means of Identification:** Ferric Chloride
- **Related Part Number:** 415-Liquid, 415-500ML, 415-1L, 415-4L, 415-20L

· **Application of the substance / the mixture** For etching printed circuits

· **Uses advised against** Not applicable

· Details of the supplier of the safety data sheet

Manufacturer/Supplier:
MG Chemicals (Head Office)
1210 Corporate Drive
Burlington, Ontario L7L 5R6
CANADA
+(1) 800-340-0772
+(1) 905-331-1396
info@mgchemicals.com

Distributor:

Masline
511 Clinton Ave S
Rochester, New York 14620
United States
+(1) 586-546-5373

· **Information department:** sds@mgchemicals.com

· Emergency telephone number:

For hazardous material incidents ONLY (leaks, spills, fires, exposures or accidents)
USA or CANADA-Call 3E at +1-866-519-4752 or +1-760-476-3962 (Service access code: 335388)

For emergencies involving the transport of dangerous goods; 24/7 service
CANADA-Call CANUTEC collect at +1-613-996-6666 or *666 on cellular phones

* 2 Hazard identification

· Classification of the substance or mixture

Corrosive to metals – Category 1 H290 May be corrosive to metals.
Acute Toxicity (Oral) - Category 4 H302 Harmful if swallowed.
Skin Irritation - Category 2 H315 Causes skin irritation.
Eye damage/irritation – Category 1 H318 Causes serious eye damage.
Aquatic Acute 3 H402 Harmful to aquatic life.

· Label elements

· GHS label elements

The product is classified and labeled according to the Globally Harmonized System (GHS).

(Contd. on page 2)

Safety Data Sheet
 according to WHMIS 2023 and HCS 2024

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

(Contd. of page 1)

· **Hazard pictograms**



GHS05 GHS07

· **Signal word** Danger

· **Hazard-determining components of labeling:**

iron trichloride
 hydrogen chloride
 iron dichloride

· **Hazard statements**

H290 May be corrosive to metals.
 H302 Harmful if swallowed.
 H315 Causes skin irritation.
 H318 Causes serious eye damage.
 H402 Harmful to aquatic life.

· **Precautionary statements**

P102 Keep out of reach of children.
 P234 Keep only in original packaging.
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P273 Avoid release to the environment.
 P280 Wear protective gloves, protective clothing, and eye protection.
 P301+P312 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
 P330 Rinse mouth.
 P302+P352 IF ON SKIN: Wash with plenty of water.
 P310 Immediately call a POISON CENTER or doctor.
 P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P332+P313 If skin irritation occurs: Get medical advice.
 P362+P364 Take off contaminated clothing and wash it before reuse.
 P390 Absorb spillage to prevent material-damage.
 P406 Store in corrosive resistant container.
 P501 Dispose of contents and container in accordance with local, regional, and national regulations.

· **Other hazards** Not available

3 Composition/Information on ingredients

· **Chemical characterization: Mixtures**

· **Description:** Mixture of the substances listed below with nonhazardous additions.

· **Dangerous components:**

7705-08-0	iron trichloride	37–42% w/w *
7647-01-0	hydrogen chloride	1.0% w/w

(Contd. on page 3)

Safety Data Sheet

according to WHMIS 2023 and HCS 2024

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

7758-94-3	iron dichloride	(Contd. of page 2) <1.0% w/w
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* Actual concentration ranges are withheld as a trade secret.

4 First-aid measures

- **Description of first aid measures**

- **General information:**

- Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

- **After inhalation:**

- Remove person to fresh air and keep comfortable for breathing.
If feeling unwell: Call a POISON CENTRE or doctor.

- **After skin contact:**

- Wash with plenty water.
If skin irritation or rash occurs: Get medical advice or attention.
Take off contaminated clothing and wash it before reuse.

- **After eye contact:**

- Rinse cautiously with water for at least 30 minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER or doctor.

- **After swallowing:**

- Rinse mouth.
Do NOT induce vomiting.
If symptoms persist consult doctor.

- **Most important symptoms and effects, both acute and delayed**

- No further relevant information available.

- **Indication of any immediate medical attention and special treatment needed**

- No further relevant information available.

5 Fire-fighting measures

- **Extinguishing media**

- **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.

- **Special hazards arising from the substance or mixture**

- Prolonged contact with metals in an enclosed space may produce explosive quantities of hydrogen gas.
Not flammable or combustible, but burns if involved in a fire. Produces irritating smoke of unknown toxicity in fires.
Prevent fire-fighting wash from entering waterway or sewer system.

- **Hazardous combustion products:**

- Carbon Oxides (COx)
Above >200 °C, toxic and corrosive gases including chlorine, hydrogen chloride, and iron oxides may be released.

(Contd. on page 4)



Safety Data Sheet

according to WHMIS 2023 and HCS 2024

Page 4/12

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

(Contd. of page 3)

- **Advice for firefighters**
 - **Protective equipment:** Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**

Wear protective equipment. Keep unprotected persons away.
Avoid breathing mist, spray, or vapors.
- **Environmental precautions:**

Avoid release to the environment.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**

Use neutralizing agent.
Collect liquid in a sealable, chemical-resistant container.
Wash residue with a paper towel and place dirty towels in container.
Use soap and water to remove the last traces of residue.
- **Reference to other sections**

See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Precautions for safe handling**

Wear protective gloves, protective clothing, and eye protection.
Wash hands thoroughly after handling.
Take off all contaminated clothing and wash it before reuse.
Do not eat, drink, or smoke when using this product.
Keep only in original packaging. Absorb spillage to prevent material-damage.

 - **Information about protection against explosions and fires:** No special measures required.
- **Conditions for safe storage, including any incompatibilities**
 - **Storage:**
 - **Requirements to be met by storerooms and receptacles:**

Keep in a dry and clean area, away from incompatible substances
 - **Information about storage in one common storage facility:** Not required
 - **Further information about storage conditions:** Keep receptacle tightly sealed.
- **Specific end use(s)** See section 1.2

— CA —
(Contd. on page 5)

Safety Data Sheet
according to WHMIS 2023 and HCS 2024

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

(Contd. of page 4)

8 Exposure controls/ Personal protection

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

7705-08-0 iron trichloride	
EL (Canada)	STEL: 2 mg/m ³ TWA: 1 mg/m ³ as Fe
REL (USA)	TWA: 1 mg/m ³ as Fe
TLV (USA)	TWA: 1 mg/m ³ as Fe
7647-01-0 hydrogen chloride	
EL (Canada)	Ceiling: 2 ppm
EV (Canada)	Ceiling: 2 ppm
PEL (USA)	Ceiling: 7 mg/m ³ , 5 ppm
REL (USA)	Ceiling: 7 mg/m ³ , 5 ppm
TLV (USA)	Ceiling: 2 ppm A4
7758-94-3 iron dichloride	
EL (Canada)	STEL: 2 mg/m ³ TWA: 1 mg/m ³ as Fe
REL (USA)	TWA: 1 mg/m ³ as Fe
TLV (USA)	TWA: 1 mg/m ³ as Fe

· **Additional information:**

The lists that were valid during the creation were used as basis.
 Refer to the national or regional occupational exposure limit regulation for abbreviations and acronyms.

· **Exposure controls**

· **Appropriate engineering controls** No further data; see section 7.

· **Personal protective equipment:**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.
 Immediately remove all soiled and contaminated clothing.
 Wash hands before breaks and at the end of work.
 Avoid contact with the skin.
 Avoid contact with the eyes and skin.

· **Breathing equipment:**

If the product is heated or worker has a known allergic reaction, consider using a full mask with organic vapor cartridge or with an independent air supply.

(Contd. on page 6)

Safety Data Sheet

according to WHMIS 2023 and HCS 2024

Trade name: 415

(Contd. of page 5)

· **Protection of hands:**

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.



Protective gloves: EN374

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation. Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**



Safety glasses or tightly sealed goggles: EN 166

* 9 Physical and chemical properties

· **Information on basic physical and chemical properties**

· Physical state	Liquid
· Form:	Low viscosity
· Color:	Red-brown
· Odor:	Acidic
· Odor threshold:	Not determined
· Melting point/Melting range:	-50 °C (-58 °F)
· Boiling point/Boiling range:	110 °C (230 °F)
· Flammability:	Non flammable
· Explosion limits:	
· Lower:	Not applicable
· Upper:	Not applicable
· Flash point:	Not applicable
· Auto igniting:	Not determined
· Decomposition temperature:	Not determined
· pH-value at 20 °C (68 °F):	<2
· Viscosity:	
· Kinematic:	Not determined
· Dynamic:	Not determined

(Contd. on page 7)

Safety Data Sheet

according to WHMIS 2023 and HCS 2024

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

(Contd. of page 6)

<ul style="list-style-type: none">· Solubility in / Miscibility with<ul style="list-style-type: none">· Water: Fully miscible.· Partition coefficient (n-octanol/water): Not determined· Vapor pressure at 20 °C (68 °F): 1 hPa (0.8 mm Hg)· Relative density at 25 °C (77 °F): 1.38-1.49· Vapor density (air=1): 1· Particle characteristics Not applicable
<ul style="list-style-type: none">· Other information<ul style="list-style-type: none">· Important information on protection of health and environment, and on safety.<ul style="list-style-type: none">· Ignition temperature: Product is not selfigniting.· Danger of explosion: Product does not present an explosion hazard.· Organic solvents: Not available· VOC content: 0.000 % 0.0 g/l / 0.00 lb/gal· Evaporation rate >1 (ButAc=1)

10 Stability and reactivity

- **Reactivity** Reacts with metals to form flammable hydrogen gas. React with alkalis (bases).
- **Chemical stability** Chemically stable at normal temperatures and pressures.
 - **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid**
Avoid open flames, excessive heat, sparks, ignition sources, and incompatible substances.
Do not use in a manner that forms fumes, vapors, or mist.
Above >200 °C, toxic and corrosive gases including chlorine, hydrogen chloride, and iron oxides may be released.
- **Incompatible materials:**
Alkali metals
Ethylene oxides
Strong oxidizing agents
Strong bases
Nylon
Styrene
Allyl chloride
- **Hazardous decomposition products:**
No dangerous decomposition products known.
Hazardous combustion products: see section 5.

Safety Data Sheet
according to WHMIS 2023 and HCS 2024

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

(Contd. of page 7)

*** 11 Toxicological information**

· **Information on toxicological effects**

· **Acute toxicity:**

· **LD/LC50 values that are relevant for classification:**

ATE (Acute Toxicity Estimate)		
Oral	LD50	729–829 mg/kg (rat)
7705-08-0 iron trichloride		
Oral	LD50	316 mg/kg (rat)
7647-01-0 hydrogen chloride		
Oral	LD50	238–277 mg/kg (rat)
Dermal	LD50	5,010 mg/kg (rabbit)
Inhalative	LC50/ 1 h	4.2 mg/L (rat)
7758-94-3 iron dichloride		
Oral	LD50	300 mg/kg (rat)
Dermal	LD50	2,000 mg/kg (rat)

· **Primary irritant effect:**

- **on the skin:** Irritant to skin and mucous membranes.
- **on the eye:** Strong irritant with the danger of severe eye injury.

· **Summary of effects and symptoms by route of exposure**

· **Eyes:**

eye damage, pain
redness
burns

· **Skin:**

pain
brown stains on skin
redness, irritation

· **Inhalation:**

cough
irritation of the respiratory tract
sore throat

Exposure to large doses of hydrogen chloride can cause cough, labored breathing, and shortness of breath.

· **Swallowed:**

irritation to the mouth, throat, esophagus, and stomach
abdominal pain
nausea
vomiting
diarrhea

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

No further relevant information available.

· **Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful

(Contd. on page 9)



Safety Data Sheet
according to WHMIS 2023 and HCS 2024

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

Irritant

(Contd. of page 8)

· **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

7647-01-0	hydrogen chloride	3
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· **NTP (National Toxicology Program)**

None of the ingredients is listed.

12 Ecological information

· **Toxicity**

· **Aquatic toxicity:** No further relevant information available.

· **Persistence and degradability** No further relevant information available.

· **Bioaccumulative potential** No further relevant information available.

· **Mobility in soil** No further relevant information available.

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable

· **vPvB:** Not applicable

· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**

· **Recommendation:** This material and its container must be disposed of as hazardous waste.

· **Uncleaned packagings:**

· **Recommendation:**

Containers may still present a chemical hazard/ danger when empty.

Dispose of contents in accordance with all local, regional, national, and international regulations.

Where possible retain label warnings and SDS and observe all notices pertaining to the product.

· **Recommended cleansing agent:** Water, if necessary with cleansing agents.

14 Transport information

· **UN-Number**

· **DOT/TDG, IMDG, IATA**

UN2582

· **UN proper shipping name**

· **DOT/TDG**

Ferric chloride, solution

(Contd. on page 10)

Safety Data Sheet
according to WHMIS 2023 and HCS 2024




Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

(Contd. of page 9)

<ul style="list-style-type: none"> · IMDG · IATA 	<p>FERRIC CHLORIDE SOLUTION Ferric chloride solution</p>
<ul style="list-style-type: none"> · Transport hazard class(es) · DOT/TDG (Transport dangerous goods): 	
 <ul style="list-style-type: none"> · Class · Label 	<p>8 Corrosive substances 8</p>
<ul style="list-style-type: none"> · IMDG, IATA 	
 <ul style="list-style-type: none"> · Class · Label 	<p>8 Corrosive substances 8</p>
<ul style="list-style-type: none"> · Packing group · DOT/TDG, IMDG, IATA 	<p>III</p>
<ul style="list-style-type: none"> · Environmental hazards: 	<p>Not applicable</p>
<ul style="list-style-type: none"> · Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code 	<p>Not applicable</p>
<ul style="list-style-type: none"> · Transport/Additional information: 	
 Limited Quantity 415-500ML, 415-1L, 415-4L	
<ul style="list-style-type: none"> · DOT/TDG · Quantity limitations 	<p>On passenger aircraft/rail: 5 L On cargo aircraft only: 60 L</p>
<ul style="list-style-type: none"> · IMDG · Limited quantities (LQ) · Excepted quantities (EQ) 	<p>5L Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml</p>
<ul style="list-style-type: none"> · Special precautions for user · Hazard identification number (Kemler code): · EMS Number: 	<p>Not applicable 80 F-A,S-B</p>

(Contd. on page 11)



Safety Data Sheet
according to WHMIS 2023 and HCS 2024

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

(Contd. of page 10)

· Segregation groups	(SGG1) Acids
· Stowage Category	A
· Segregation Code	SG36 Stow "separated from" SGG18-alkalis. SG49 Stow "separated from" SGG6-cyanides
· UN "Model Regulation":	UN 2582 FERRIC CHLORIDE, SOLUTION, 8, III

***15 Regulatory information**

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

· OSHA Hazard Communication Standard (29 CFR Part 1900)

The safety data sheet and label comply with HCS 2024.

· Hazardous Products Act (R.S.C., 1985, c. H-3)

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2023.

· Sara

· Section 355 (extremely hazardous substances):
7647-01-0 hydrogen chloride
· Section 313 (Specific toxic chemical listings):
7647-01-0 hydrogen chloride
· TSCA (Toxic Substances Control Act):
All components have the value ACTIVE.
· Hazardous Air Pollutants
7647-01-0 hydrogen chloride

· Proposition 65

· Chemicals known to cause cancer:
None of the ingredients is listed.
· Chemicals known to cause reproductive toxicity for females:
None of the ingredients is listed.
· Chemicals known to cause reproductive toxicity for males:
None of the ingredients is listed.
· Chemicals known to cause developmental toxicity:
None of the ingredients is listed.

· Carcinogenic categories

· TLV (Threshold Limit Value)	
7647-01-0 hydrogen chloride	A4
· NIOSH-Ca (National Institute for Occupational Safety and Health)	
None of the ingredients is listed.	

(Contd. on page 12)

Safety Data Sheet

according to WHMIS 2023 and HCS 2024

Date of issue 01/26/2026

Version number 4.01

Revision: 11/04/2025

Trade name: 415

(Contd. of page 11)

· Canadian substance listings:

· Canadian Domestic Substances List (DSL)
All ingredients are listed.
· Canadian Non-Domestic Substances List (NDSL)
None of the ingredients is listed.
· Canadian Ingredient Disclosure list (limit 0.1%)
None of the ingredients is listed.
· Canadian Ingredient Disclosure list (limit 1%)
7647-01-0 hydrogen chloride

· HMIS-ratings (scale 0 - 4)

Health = 2
Fire = 0
Reactivity = 1

· Europe**· RoHS (Restriction of Hazardous Substances Directive)**

This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP and complies with European RoHS regulations.

· WEEE (Waste Electrical and Electronic Equipment Directive)

This product is not a piece of electrical or electronics equipment, and is therefore not governed by this regulation.

· Per- and polyfluoroalkyl substances (PFAS)

None of the ingredients is listed.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** Regulatory department

· **Contact:** sds@mgchemicals.com

· **Version number of previous version:** 4.00

· **Date of preparation** 01/26/2026

· Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety

· * **Data compared to the previous version altered.**