

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

### · 1.1 Product identifier

#### · Trade name: 415

- **Other Means of Identification:** Ferric Chloride
- **Related Part Number:** 415-Liquid, 415-500ML, 415-1L, 415-4L, 415-20L
- **UFI:** 6V90-300T-G000-GDFU

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

- **Application of the substance / the mixture** For etching printed circuits
- **Uses advised against** Not applicable

### · 1.3 Details of the supplier of the safety data sheet

#### · **Manufacturer/Supplier:**

MG Chemicals Ltd. (Head Office)  
1210 Corporate Drive  
Burlington, Ontario L7L 5R6  
CANADA  
+(1) 905-331-1396  
info@mgchemicals.com

MG Chemicals  
Heame House, 23 Bliston Street  
Sedgely Dudley DY3 1JA.  
United Kingdom  
+(44) 1663 362888

MG Chemicalst Ltd.  
18-20, Msida Road,  
Gzira, GZR 1401  
MALTA

- **Further information obtainable from:** sds@mgchemicals.com

### · 1.4 Emergency telephone number:

3E (Access code: 335388)  
+(44) 20 3514787  
+(1) 760 476 3961  
UK Toll free: +(0) 800 680 0425

Members of the public seeking specific information on poisons should contact:  
In England and Wales: NHS 111 - dial 111  
In Scotland: NHS 24 - dial 111

## \* SECTION 2: Hazards identification

### · 2.1 Classification of the substance or mixture

#### · **Classification according to Regulation (EC) No 1272/2008**

Met. Corr. 1 H290 May be corrosive to metals.  
Acute Tox. 4 H302 Harmful if swallowed.  
Skin Irrit. 2 H315 Causes skin irritation.  
Eye Dam. 1 H318 Causes serious eye damage.

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## 2.2 Label elements

### Labelling according to Regulation (EC) No 1272/2008

The product is classified and labelled according to the GB CLP regulation.

#### Hazard pictograms



GHS05 GHS07

#### Signal word Danger

#### Hazard-determining components of labelling:

iron trichloride  
iron dichloride  
hydrogen chloride

#### Hazard statements

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

#### 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.  
P280 Wear protective gloves, protective clothing, and eye protection.  
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
P310 Immediately call a POISON CENTER or doctor.  
P501 Dispose of contents and container in accordance with local, regional, and national regulations.

## 2.3 Other hazards

### Results of PBT and vPvB assessment

- PBT: Not applicable
- vPvB: Not applicable

• Determination of endocrine-disrupting properties Endocrine Disruptor substance  $\geq 0.1\%$  = none

## SECTION 3: Composition/information on ingredients

### 3.2 Mixtures

• Description: Mixture of substances listed below with nonhazardous additions.

#### Dangerous components:

CAS: 7705-08-0 EINECS: 231-729-4	iron trichloride ☞ Met. Corr. 1, H290; Eye Dam. 1, H318; ☞ Acute Tox. 4, H302; Skin Irrit. 2, H315	37–42%
CAS: 7647-01-0 EINECS: 231-595-7 Index number: 017-002-00-2	hydrogen chloride ☞ Skin Corr. 1B, H314; Eye Dam. 1, H318; ☞ STOT SE 3, H335 Specific concentration limits: Skin Corr. 1B; H314: C $\geq 25\%$ Skin Irrit. 2; H315: $10\% \leq C < 25\%$ Eye Irrit. 2; H319: $10\% \leq C < 25\%$ STOT SE 3; H335: C $\geq 10\%$	1.0%

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CAS: 7758-94-3 EINECS: 231-843-4	iron dichloride ☠ Acute Tox. 3, H301; ☠ Acute Tox. 4, H312; Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335	(Contd. of page 2) <1.0%
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· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

## SECTION 4: First aid measures

### · 4.1 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.

### · 4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

### · 4.3 Indication of any immediate medical attention and special treatment needed

No further relevant information available.

## SECTION 5: Firefighting measures

### · 5.1 Extinguishing media

· **Suitable extinguishing agents:** Use fire extinguishing methods suitable to surrounding conditions.

### · 5.2 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.

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· **5.3 Advice for firefighters**

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

## **SECTION 6: Accidental release measures**

· **6.1 Personal precautions, protective equipment and emergency procedures**

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

· **6.2 Environmental precautions:**

- Avoid release to the environment.
- Do not allow to enter sewers/ surface or ground water.

· **6.3 Methods and material for containment and cleaning up:**

- Use neutralising 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.

· **6.4 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.

## **SECTION 7: Handling and storage**

· **7.1 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 fire - and explosion protection:** No special measures required.

· **7.2 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 container tightly sealed.
- **Storage class:** 12

· **7.3 Specific end use(s)** See section 1.2

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## SECTION 8: Exposure controls/personal protection

### · 8.1 Control parameters

#### · Ingredients with limit values that require monitoring at the workplace:

7705-08-0 iron trichloride	
WEL	Short-term value: 2 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup> as Fe
7647-01-0 hydrogen chloride	
WEL	Short-term value: 8 mg/m <sup>3</sup> , 5 ppm Long-term value: 2 mg/m <sup>3</sup> , 1 ppm (gas and aerosol mists)
7758-94-3 iron dichloride	
WEL	Short-term value: 2 mg/m <sup>3</sup> Long-term value: 1 mg/m <sup>3</sup> as Fe

#### · Additional information:

The lists valid during the making were used as basis.

Refer to the national or regional occupational exposure limit regulation for abbreviations and acronyms.

### · 8.2 Exposure controls

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

· **Individual protection measures, such as 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.

#### · Respiratory protection:

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.

#### · Hand protection

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.

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· Eye/face protection



Safety glasses or tightly sealed goggles: EN 166

## SECTION 9: Physical and chemical properties

### · 9.1 Information on basic physical and chemical properties

· Physical state	Liquid
· Form:	Low viscosity
· Colour:	Red-brown
· Odour:	Acidic
· Odour threshold:	Not determined
· Melting point/freezing point:	-50 °C
· Boiling point or initial boiling point and boiling range	110 °C
· Flammability	Non flammable
· Lower and upper explosion limit	
· Lower:	Not applicable
· Upper:	Not applicable
· Flash point:	Not applicable
· Auto-ignition temperature:	Not determined
· Decomposition temperature:	Not determined
· pH at 20 °C	<2
· Viscosity:	
· Kinematic viscosity	Not determined
· Dynamic:	Not determined
· Solubility	
· water:	Fully miscible.
· Partition coefficient n-octanol/water (log value)	Not determined
· Vapour pressure at 20 °C:	1 hPa (7705-08-0 iron trichloride)
· Relative density at 25 °C:	1.38-1.49
· Vapour density (air=1):	1
· Particle characteristics	Not applicable.

### · 9.2 Other information

#### · 9.2.1 Information with regard to physical hazard classes

· Corrosive to metals May be corrosive to metals.

#### · 9.2.2 Other safety characteristics

· Evaporation rate >1 (ButAc=1)  
 · Ignition temperature: Product is not selfigniting.  
 · Explosive properties: Product does not present an explosion hazard.  
 · Solvent content:  
 · Organic solvents: Not available

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· VOC (EC)	0.00 %
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## SECTION 10: Stability and reactivity

- **10.1 Reactivity** Reacts with metals to form flammable hydrogen gas. React with alkalis (bases).
- **10.2 Chemical stability** Chemically stable at normal temperatures and pressures.
  - **Thermal decomposition / conditions to be avoided:**  
No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 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.
- **10.5 Incompatible materials:**  
Alkali metals  
Ethylene oxides  
Strong oxidizing agents  
Strong bases  
Nylon  
Styrene  
Allyl chloride
- **10.6 Hazardous decomposition products:**  
No dangerous decomposition products known.  
Hazardous combustion products: see section 5.

## \* SECTION 11: Toxicological information

- **11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**
  - **Acute toxicity** Harmful if swallowed.

· LD/LC50 values relevant for classification:		
<b>ATE (Acute Toxicity Estimates)</b>		
Oral	LD50	752–854 mg/kg (rat)
<b>7705-08-0 iron trichloride</b>		
Oral	LD50	316 mg/kg (rat)
<b>7647-01-0 hydrogen chloride</b>		
Oral	LD50	238–277 mg/kg (rat)
Dermal	LD50	5,010 mg/kg (rabbit)
Inhalative	LC50/ 1 h	4.2 mg/L (rat)
<b>7758-94-3 iron dichloride</b>		
Oral	LD50	300 mg/kg (rat)
Dermal	LD50	2,000 mg/kg (rat)

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- **Primary irritant effect:**
  - **Skin corrosion/irritation** Causes skin irritation.
  - **Serious eye damage/irritation** Causes serious eye damage.
  - **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure** Based on available data, the classification criteria are not met.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.
- **Summary of Effects and Symptoms by Routes 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
- **Subacute to chronic toxicity:**
  - **Delayed and immediate effects as well as chronic effects from short and long-term exposure**
    - No further relevant information available.

· **11.2 Information on other hazards**

· <b>Endocrine disrupting properties</b>
None of the ingredients is listed.

## SECTION 12: Ecological information

- **12.1 Toxicity**
  - **Aquatic toxicity:** No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **12.5 Results of PBT and vPvB assessment**
  - **PBT:** Not applicable

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- **vPvB:** Not applicable
- **12.6 Endocrine disrupting properties**  
The product does not contain substances with endocrine disrupting properties.
- **12.7 Other adverse effects**
  - **Additional ecological information:**
    - **General notes:**  
Rinse off of bigger amounts into drains or the aquatic environment may lead to decreased pH-values. A low pH-value harms aquatic organisms. In the dilution of the use-level the pH-value is considerably increased, so that after the use of the product the aqueous waste, emptied into drains, is only low water-dangerous.  
Must not reach sewage water or drainage ditch undiluted or unneutralised.  
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water  
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

## SECTION 13: Disposal considerations

- **13.1 Waste treatment methods**
  - **Recommendation** This material and its container must be disposed of as hazardous waste.

· <b>European waste catalogue</b>	
HP4	Irritant - skin irritation and eye damage
HP6	Acute Toxicity

- **Uncleaned packaging:**
  - **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 agents:** Water, if necessary together with cleansing agents.

## SECTION 14: Transport information

· <b>14.1 UN number or ID number</b>	
· <b>ADR, IMDG, IATA</b>	UN2582
· <b>14.2 UN proper shipping name</b>	
· <b>ADR, IMDG</b>	FERRIC CHLORIDE SOLUTION
· <b>IATA</b>	Ferric chloride solution
· <b>14.3 Transport hazard class(es)</b>	
· <b>ADR, IMDG, IATA</b>	
	
· <b>Class</b>	8 Corrosive substances.

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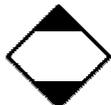
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· Label	8
· 14.4 Packing group · ADR, IMDG, IATA	III
· 14.5 Environmental hazards:	Not applicable
· 14.6 Special precautions for user	Not applicable
· Hazard identification number (Kemler code):	80
· EMS Number:	F-A,S-B
· Segregation groups	(SGG1) Acids
· Stowage Category	A
· Segregation Code	SG36 Stow "separated from" SGG18-alkalis. SG49 Stow "separated from" SGG6-cyanides
· 14.7 Maritime transport in bulk according to IMO instruments	Not applicable
· Transport/Additional information:	
 Limited Quantity	
415-500ML, 415-1L, 415-4L	
· ADR	
· Limited quantities (LQ)	5L
· Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· Transport category	3
· Tunnel restriction code	E
· IMDG	
· Limited quantities (LQ)	5L
· Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· UN "Model Regulation":	UN 2582 FERRIC CHLORIDE SOLUTION, 8, III

## SECTION 15: Regulatory information

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

· Poisons Act

· Regulated explosives precursors (Part 1)	
7647-01-0   hydrogen chloride	10%

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<ul style="list-style-type: none"> <li>· <b>Regulated poisons (Part 2)</b></li> </ul>	
None of the ingredients is listed.	
<ul style="list-style-type: none"> <li>· <b>Reportable explosives precursors (Part 3)</b></li> </ul>	
None of the ingredients is listed.	
<ul style="list-style-type: none"> <li>· <b>Reportable poisons (Part 4)</b></li> </ul>	
None of the ingredients is listed.	
<ul style="list-style-type: none"> <li>· <b>Directive 2012/18/EU</b></li> <li>· <b>Named dangerous substances - ANNEX I</b> None of the ingredients is listed.</li> <li>· <b>REGULATION (EC) No 1907/2006 ANNEX XVII</b> Conditions of restriction: 3</li> </ul>	
<ul style="list-style-type: none"> <li>· <b>DIRECTIVE 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment – Annex II</b></li> </ul>	
None of the ingredients is listed.	
<ul style="list-style-type: none"> <li>· <b>Annex I - RESTRICTED EXPLOSIVES PRECURSORS (Upper limit value for the purpose of licensing under Article 5(3))</b></li> </ul>	
None of the ingredients is listed.	
<ul style="list-style-type: none"> <li>· <b>Annex II - REPORTABLE EXPLOSIVES PRECURSORS</b></li> </ul>	
None of the ingredients is listed.	
<ul style="list-style-type: none"> <li>· <b>Regulation (EC) No 273/2004 on drug precursors</b></li> </ul>	
7647-01-0   hydrogen chloride	3
<ul style="list-style-type: none"> <li>· <b>Regulation (EC) No 111/2005 laying down rules for the monitoring of trade between the Community and third countries in drug precursors</b></li> </ul>	
7647-01-0   hydrogen chloride	3
<ul style="list-style-type: none"> <li>· <b>15.2 Chemical safety assessment:</b> A Chemical Safety Assessment has not been carried out.</li> </ul>	

## SECTION 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.

- **Relevant phrases**  
 H290 May be corrosive to metals.  
 H301 Toxic if swallowed.  
 H302 Harmful if swallowed.  
 H312 Harmful in contact with skin.  
 H314 Causes severe skin burns and eye damage.  
 H315 Causes skin irritation.  
 H318 Causes serious eye damage.  
 H319 Causes serious eye irritation.  
 H335 May cause respiratory irritation.

<ul style="list-style-type: none"> <li>· <b>Classification according to Regulation (EC) No 1272/2008</b></li> </ul>	
Corrosive to metals	On basis of test data
Acute toxicity - oral Skin corrosion/irritation Serious eye damage/irritation	The classification of the mixture is generally based on the calculation method using substance data according to Regulation (EC) No 1272/2008.

- **Department issuing SDS:** Regulatory department
- **Contact:** sds@mgchemicals.com

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- **Date of previous version:** 28.11.2024
- **Version number of previous version:** 4.00
- **Abbreviations and acronyms:**
  - ADR: Accord relatif au transport international des marchandises dangereuses par route (European Agreement Concerning the International Carriage of Dangerous Goods by Road)
  - IMDG: International Maritime Code for Dangerous Goods
  - IATA: International Air Transport Association
  - GHS: Globally Harmonised System of Classification and Labelling of Chemicals
  - 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
  - ATE: Acute toxicity estimate values
  - Met. Corr. 1: Corrosive to metals – Category 1
  - Acute Tox. 3: Acute toxicity – Category 3
  - Acute Tox. 4: Acute toxicity – Category 4
  - Skin Corr. 1B: Skin corrosion/irritation – Category 1B
  - Skin Irrit. 2: Skin corrosion/irritation – Category 2
  - Eye Dam. 1: Serious eye damage/eye irritation – Category 1
  - Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
  - STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
- **\* Data compared to the previous version altered.**

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