



# Safety Data Sheet

Revision Date May-28-2015

Item # 12243

Distributed by: PVS NOLWOOD CHEMICALS, INC. 19890 Harper Avenue Detroit, MI 48213 (313) 925-0300	
PVS ITEM #	PVS SDS #
12243	4120
CONTROLLED DOCUMENT IF STAMPED IN RED	

## 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name** Ferric Chloride Etchant Grade 41%  
**UN/ID No.** UN2582  
**Synonyms** Iron (III) Chloride, Iron trichloride, FeCl<sub>3</sub>  
**Recommended Use** Metal etching  
**Uses advised against** Consumer uses: Private households (= general public = consumers).

**Company Name**  
PVS Technologies, Inc.  
10900 Harper Ave.  
Detroit, MI 48213  
(313) 571-1100

**24 Hour Emergency Phone Number** CHEMTREC 1-800-424-9300

## 2. HAZARDS IDENTIFICATION

### Classification

Acute toxicity - Oral	Category 4
Skin corrosion/irritation	Category 1
Serious eye damage/eye irritation	Category 1

### Emergency Overview

#### DANGER

#### Hazard statements

Harmful if swallowed  
Causes severe skin burns and eye damage

#### Physical hazards

Do not handle until all hazard precautions have been read and understood



### Precautionary statements

#### Prevention

- Wear eye/face protection
- Wear protective gloves/protective clothing/eye protection/face protection
- Do not breathe dust/fume/gas/mist/vapors/spray
- Do not eat, drink or smoke when using this product
- Wash face, hands and any exposed skin thoroughly after handling
- Immediately call a POISON CENTER or doctor/physician
- Specific treatment (see section 4 on this Safety Data Sheet)
- Store in a secure area
- Dispose of contents/container to an approved waste disposal plant

#### Response

#### Storage

#### Disposal

### Hazards not otherwise classified (HNOC)

None known.

### Other Information

#### Other hazards

- Toxic to aquatic life with long lasting effects
- Toxic to aquatic life

**Item # 12243 Ferric Chloride Etchant Grade 41%**

Unknown Acute Toxicity

0% of the mixture consists of ingredient(s) of unknown toxicity

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Chemical Name	CAS No.	EC No.	Weight-% *
Water	7732-18-5	231-791-2	52-68
Iron trichloride	7705-08-0	231-729-4	32-45
Hydrogen chloride	7647-01-0	231-595-7	0-3.0

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

**4. FIRST AID MEASURES**

<b>General advice</b>	Immediate medical attention is required
<b>Eye contact</b>	<ul style="list-style-type: none"><li>• Immediate medical attention is required</li><li>• Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes</li><li>• Do not rub affected area</li></ul>
<b>Skin Contact</b>	<ul style="list-style-type: none"><li>• Immediate medical attention is required</li><li>• Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes</li><li>• Wash contaminated clothing before reuse</li></ul>
<b>Inhalation</b>	<ul style="list-style-type: none"><li>• Remove to fresh air</li><li>• Call a physician or poison control center immediately</li><li>• If not breathing, give artificial respiration</li><li>• If breathing is difficult, give oxygen</li></ul>
<b>Ingestion</b>	<ul style="list-style-type: none"><li>• Call a physician or poison control center immediately</li><li>• Do NOT induce vomiting</li><li>• Rinse mouth</li><li>• Drink 4 to 8 ounces (120-240 ml) of water or milk as soon as possible after ingestion.</li><li>• Never give anything by mouth to an unconscious person</li></ul>
<b>Note to physician</b>	Product is a corrosive material. Use of gastric lavage or emesis is contraindicated. Possible perforation of stomach or esophagus should be investigated. Do not give chemical antidotes. Asphyxia from glottal edema may occur. Marked decrease in blood pressure may occur with moist rales, frothy sputum, and high pulse pressure. Treat symptomatically.
<b>Self-protection for first aid personnel</b>	Use personal protective equipment as required. Avoid contact with skin, eyes or clothing.

**5. FIRE-FIGHTING MEASURES**

<b>Suitable extinguishing media</b>	<ul style="list-style-type: none"><li>• Dry chemical, CO2, water spray or alcohol-resistant foam</li><li>• Use extinguishing measures that are appropriate to local circumstances and the surrounding environment</li></ul>
<b>Unsuitable extinguishing media</b>	<ul style="list-style-type: none"><li>• Caution: Use of water spray when fighting fire may be inefficient</li><li>• Do not use a solid water stream as it may scatter and spread fire</li></ul>
<b>Specific hazards arising from the chemical</b>	<ul style="list-style-type: none"><li>• The product causes burns of eyes, skin and mucous membranes</li><li>• Thermal decomposition can lead to release of irritating and toxic gases and vapors</li><li>• In the event of fire and/or explosion, do not breathe fumes</li></ul>
<b>Protective equipment and precautions for firefighters</b>	<ul style="list-style-type: none"><li>• Wear a self-contained breathing apparatus and chemical protective clothing</li></ul>

- Flammable properties**                      • No information available  
**Explosive properties**                      • No information available

**6. ACCIDENTAL RELEASE MEASURES**

- Personal precautions**                      • Evacuate personnel to safe areas  
     • Use personal protective equipment as required  
     • Avoid contact with skin, eyes or clothing
- Environmental precautions**                • Keep people away from and upwind of spill/leak  
     • For small spills absorb material on dry rags, cat litter or similar absorbent material and dispose of in the trash  
     • For large spills, contain the material using barriers of absorbent pigs, clay absorbent or earth dams.  
     • US regulations require reporting spills of this material that could reach any surface waters. The toll free phone number for the US Coast Guard National Response Center is 1-800-424-8802
- Methods for cleaning up**                    • Dike far ahead of liquid spill for later disposal  
     • Neutralize with soda ash or lime  
     • Soak up with inert absorbent material  
     • Take up mechanically, placing in appropriate containers for disposal  
     • Clean contaminated surface thoroughly  
     • Prevent product from entering drains
- Other Information**                            • No information available

**7. HANDLING AND STORAGE**

- Advice on safe handling**                    • Use personal protective equipment as required  
     • Avoid contact with skin, eyes or clothing  
     • Ensure adequate ventilation, especially in confined areas  
     • In case of insufficient ventilation, wear suitable respiratory equipment  
     • Use only with adequate ventilation and in closed systems
- Storage Conditions**                        • Keep containers tightly closed in a dry, cool and well-ventilated place  
     • Keep in properly labeled containers  
     • Keep out of the reach of children
- Incompatible materials**                    Incompatible with strong acids and bases, oxidizers, steel, and most metals

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Iron trichloride 7705-08-0	TWA: 1 mg/m <sup>3</sup> Fe	-	TWA: 1 mg/m <sup>3</sup> Fe
Hydrogen chloride 7647-01-0	Ceiling: 2 ppm	Ceiling: 5 ppm Ceiling: 7 mg/m <sup>3</sup>	IDLH: 50 ppm Ceiling: 5 ppm Ceiling: 7 mg/m <sup>3</sup>

**Exposure Guidelines**                      .

**Engineering Controls**                      Ensure adequate ventilation, especially in confined areas.

**Individual protection measures, such as personal protective equipment**

- Respiratory protection**                    • A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant the use of a respirator.
- Eye/Face protection**                      • Tight sealing safety goggles  
     • Face protection shield

- Skin and body protection**
- Wear suitable protective clothing
  - Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact
- General Hygiene Considerations**
- Do not eat, drink or smoke when using this product
  - Wash contaminated clothing before reuse
  - Contaminated work clothing should not be allowed out of the workplace
  - Regular cleaning of equipment, work area and clothing is recommended
  - Avoid contact with skin, eyes or clothing

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

<b>Physical state</b>	Liquid
<b>Appearance</b>	Clear to slightly hazy
<b>Color</b>	clear reddish brown
<b>Odor</b>	Slight Iron acidic
<b>Odor threshold</b>	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks • Method</u>
<b>pH</b>	<2.0	
<b>Melting point/Freezing Point</b>	-46 °C / -51 °F	
<b>Boiling point / boiling range</b>	110 °C / 230 °F	
<b>Flash point</b>	No information available	
<b>Evaporation rate</b>	1	Butyl acetates =1
<b>Flammability (solid, gas)</b>	No information available	
<b>Flammability Limit in Air</b>		
<b>Upper flammability limit (%)</b>	No information available	
<b>Lower flammability limit (%)</b>	No information available	
<b>Vapor pressure</b>	No information available	
<b>Vapor density</b>	No information available	
<b>Specific Gravity</b>	1.45	
<b>Water solubility</b>	Miscible in water	
<b>Solubility in other solvents</b>	No information available	
<b>Partition coefficient</b>	No information available	
<b>Autoignition temperature</b>	No information available	
<b>Decomposition temperature</b>	No information available	
<b>Kinematic viscosity</b>	No information available	
<b>Dynamic viscosity</b>	No information available	
<b>Explosive properties</b>	No information available	
<b>Oxidizing properties</b>	No information available	

<u>Other Information</u>	
<b>Softening point °C</b>	No information available
<b>Molecular weight</b>	No information available
<b>VOC Content (%)</b>	No information available
<b>Density</b>	No information available
<b>Bulk density</b>	12.093 Pounds per gallon (lb/gal)

## 10. STABILITY AND REACTIVITY

- Stability**
- Stable under recommended storage conditions
- Conditions to avoid**
- Exposure to air or moisture over prolonged periods
- Incompatible materials**
- Incompatible with strong acids and bases, oxidizers, steel, and most metals
- Hazardous Decomposition Products**
- Thermal decomposition can lead to release of irritating and toxic gases and vapors
- Possibility of Hazardous Reactions**
- None under normal processing and storage

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

<b>Principle Routes of Exposure</b>	Inhalation, Skin Contact, Eye contact
<b>Inhalation</b>	May cause irritation of respiratory tract. Avoid breathing vapors or mists.
<b>Ingestion</b>	May be harmful if swallowed.
<b>Skin Contact</b>	May cause skin irritation and/or dermatitis.
<b>Eye contact</b>	Contact with eyes may cause irritation.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Iron trichloride 7705-08-0	= 450 mg/kg ( Rat )	>2000 mg/kg (rat)	-
Hydrogen chloride 7647-01-0	= 700 mg/kg ( Rat )	> 5010 mg/kg ( Rabbit )	= 3124 ppm ( Rat ) 1 h

### Information on toxicological effects

**Symptoms** No information available  
**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

**Sensitization** No information available.  
**Germ cell mutagenicity** No information available.  
**Carcinogenicity** The table below indicates whether each agency has listed any ingredient as a carcinogen.

Chemical Name	ACGIH	IARC	NTP	OSHA
Hydrogen chloride 7647-01-0	-	Group 3	-	-

*IARC (International Agency for Research on Cancer)  
 Not classifiable as a human carcinogen*

**Reproductive toxicity** No information available.  
**STOT - single exposure** No information available.  
**STOT - repeated exposure** No information available.  
**Chronic toxicity** Chronic exposure to corrosive fumes/gases may cause erosion of the teeth followed by jaw necrosis. Bronchial irritation with chronic cough and frequent attacks of pneumonia are common. Gastrointestinal disturbances may also be seen. Avoid repeated exposure. Possible risk of irreversible effects. May cause adverse liver effects.  
**Target Organ Effects** Eyes, Gastrointestinal tract (GI), Liver, Respiratory system, Skin.  
**Aspiration hazard** No information available.

### Numerical measures of toxicity - Product Information

**Unknown Acute Toxicity** 0% of the mixture consists of ingredient(s) of unknown toxicity  
**The following values are calculated based on chapter 3.1 of the GHS document .**

## 12. ECOLOGICAL INFORMATION

### Ecotoxicity

Ecotoxicity Toxic to aquatic life with long lasting effects  
**1.5% of the mixture consists of component(s) of unknown hazards to the aquatic environment**

Chemical Name	Algae/aquatic plants	Fish	Crustacea
Iron trichloride 7705-08-0	-	20.95 - 22.56: 96 h Pimephales promelas mg/L LC50 semi-static 20.26: 96 h Lepomis macrochirus mg/L LC50 semi-static	27.9: 48 h Daphnia magna mg/L EC50 9.6: 48 h Daphnia magna mg/L EC50 Static

**Persistence and degradability** No information available.  
**Bioaccumulation** No information available

Chemical Name	Partition coefficient
Iron trichloride 7705-08-0	-4

Other adverse effects No information available

**13. DISPOSAL CONSIDERATIONS**

- Disposal of wastes** • This material, as supplied, is a hazardous waste according to federal regulations (40 CFR 261)
- Contaminated packaging** • Do not reuse container
- US EPA Waste Number** • D002

This product contains one or more substances that are listed with the State of California as a hazardous waste.

Chemical Name	California Hazardous Waste Status
Iron trichloride 7705-08-0	Toxic Corrosive

**14. TRANSPORT INFORMATION**

**DOT**

- Proper shipping name** FERRIC CHLORIDE, SOLUTION
- Hazard Class** 8
- UN/ID No.** UN2582
- Packing Group** III
- RQ as is (lbs)(wet)** 2439
- Description** UN2582, Ferric chloride, solution, 8, III
- Special Provisions** B15, IB3, T4, TP1
- Emergency Response Guide Number** 154

**IATA**

- UN/ID No.** UN2582
- Proper shipping name** FERRIC CHLORIDE SOLUTION
- Hazard Class** 8
- Packing Group** III
- ERG Code** 8L
- Special Provisions** A3

**IMDG**

- UN/ID No.** UN2582
- Proper shipping name** FERRIC CHLORIDE, SOLUTION
- Hazard Class** 8
- Packing Group** III
- EmS-No.** F-A, S-B
- Special Provisions** 223

**15. REGULATORY INFORMATION**

**US Federal Regulations**

**SARA 311/312 Hazard Categories**

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

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

Chemical Name	SARA 313 - Threshold Values %
Hydrogen chloride - 7647-01-0	1.0

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**CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Iron trichloride 7705-08-0	1000 lb	-	-	X
Hydrogen chloride 7647-01-0	5000 lb	-	-	X

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	RQ (lbs)(dry)
Iron trichloride 7705-08-0	1000 lb	-	RQ 1000 lb final RQ RQ 454 kg final RQ
Hydrogen chloride 7647-01-0	5000 lb	5000 lb	RQ 5000 lb final RQ RQ 2270 kg final RQ

**US State Regulations**

**California Proposition 65**

This product does not contain any Proposition 65 chemicals

**U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Iron trichloride 7705-08-0	X	X	X
Hydrogen chloride 7647-01-0	X	X	X

**DEA List I, List II**

Chemical Name	U.S. - DEA - List I or Precursor Chemicals	U.S.- DEA - List II or Essential Chemicals
Hydrogen chloride 7647-01-0	-	50 gallon, Export Volume 27 kg, Export Weight 0 kg, Domestic Sales Weight

**International Inventories**

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

**Legend:**

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

**16. OTHER INFORMATION**

<b><u>NFPA</u></b>	Health hazards 3	Flammability 0	Instability 0	Physical and Chemical Properties -
<b><u>HMIS</u></b>	Health hazards 3	Flammability 0	Physical hazards 0	Personal protection D

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Revision Note \*\*\* Updated value on SDS.

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**End of Safety Data Sheet**