

**SAFETY DATA SHEET (SDS)**

**Section 1. Identification**

<b>Product identifier</b>	FERRIC CHLORIDE
<b>Other means of identification</b>	AE120
<b>Recommended use and restrictions on use</b>	Cleaner used for etching copper boards and other metals in 1 L containers.
<b>Initial supplier identifier</b>	Asalco Inc. 44, ch. Des Ursulines, Stanstead, Québec (Canada), J0B 3E0 Telephone 819-876-2211; Fax 819-876-5373; Internet <a href="http://www.asalco.com">www.asalco.com</a>
<b>Emergency telephone number/restriction on use</b>	Canada – CANUTEC 24 hour number 613-996-6666

**Section 2. Hazard identification**

<b>Classification of hazardous product (name of the category or subcategory of the hazard class)</b>
Corrosive to metals (Category 1) Acute toxicity oral (Category 4) Acute toxicity inhalation (Category 4) Skin corrosion (Category 1B) Serious eye damage (Category 1) Specific target organ toxicity – Single exposure (Category 3)
<b>Information elements (symbols, signal words, hazard statements and precautionary statements of the category/subcategory)</b>



Danger

H290 May be corrosive to metals.

H302 Harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H332 Harmful if inhaled.

H335 May cause respiratory irritation.

P234 Keep only in original packaging. P260 Do not breathe dusts or mists. P261 Avoid breathing dust/fume/gas/mist/vapours/spray. P264 Wash hands/nails/face thoroughly after handling. P270 Do not eat, drink or smoke when using this product. P271 Use only outdoors or in a well-ventilated area. P280 Wear protective gloves/ protective clothing/ eye protection/ face protection. P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. P312 Call a doctor if you feel unwell. P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. P363 Wash contaminated clothing before reuse. P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P310 Immediately call a doctor. P390 Absorb spillage to prevent material-damage. P403 + P233 Store in a well-ventilated place. Keep container tightly closed. P405 Store locked up. P501 Dispose of contents/container into safe container in accordance with local, regional or national regulations.

<b>Other hazards known</b>	None
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**Section 3. Composition/information on ingredients**

Chemical name (common name/synonyms)	CAS number or other	Concentration (%)
Ferric chloride	7705-08-0	30-60
Hydrochloric acid	7647-01-0	1-5

**Section 4. First-aid measures**

<b>Inhalation</b>	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a doctor.
<b>Ingestion</b>	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Rinse mouth thoroughly with water. Have victim drink two glasses of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Call a doctor if you feel unwell.
<b>Skin contact</b>	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water (15-20 minutes). Wash contaminated clothing before reuse.
<b>Eye contact</b>	IF IN EYES, Rinse cautiously with water for several minutes (15-20). Remove contact lenses, if present and easy to do. Continue rinsing.
<b>Most important symptoms and effects (acute or delayed)</b>	Causes severe skin, respiratory or digestive tract burns and eye damage.
<b>Indication of immediate medical attention/special treatment</b>	In all cases, call a doctor. Do not forget this document.

<b>Section 5. Fire-fighting measures</b>			
<b>Specific hazards of the hazardous product (hazardous combustion products)</b>			
Carbon oxides and other irritant/toxic gases and fumes.			
<b>Suitable and unsuitable extinguishing media</b>			
In case of fire: Use carbon dioxide, chemical powder agent and appropriate foam to extinguish surrounding products.			
<b>Special protective equipment and precautions for fire-fighters</b>			
During a fire, irritating/toxic smoke and fumes may be generated. Do not enter fire area without proper protection. Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece. Shield personnel to protect from venting, rupturing or bursting cans. Move containers from fire area if it can be done without risk. Water spray may be useful in cooling equipment and cans exposed to heat and flame.			
<b>Section 6. Accidental release measures</b>			
<b>Personal precautions, protective equipment and emergency procedures</b>			
Absorb spillage to prevent material-damage. Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. All persons dealing with clean-up should wear the appropriate protective equipment (See Section 8).			
<b>Methods and materials for containment and cleaning up</b>			
Ventilate area of release. Stop the leak if it can be done safely. Contain and absorb any spilled liquid concentrate with inert absorbent material, then place material into a container for later disposal (see Section 13). Contaminated absorbent material may pose the same hazards as the spilled product. Notify the appropriate authorities as required.			
<b>Section 7. Handling and storage</b>			
<b>Precautions for safe handling</b>			
May be corrosive to metals. Keep only in original packaging. Use only outdoors or in a well-ventilated area. Wear protective gloves/ protective clothing/ eye protection/ face protection. Before handling, it is very important that engineering controls are operating, and that protective equipment requirements and personal hygiene measures are being followed. People working with this chemical should be properly trained regarding its hazards and its safe use. Inspect containers for leaks before handling. Label containers appropriately. Ensure proper ventilation. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid contact with eyes, skin and clothing. Keep away from heat, sparks and flame. Avoid generating high concentrations of dusts, vapours or mists. Keep away from incompatible materials (Section 10). Keep containers closed when not in use. Empty containers are always dangerous. Refer also to Section 8.			
<b>Conditions for safe storage, including any incompatibilities</b>			
Store in a well-ventilated place. Keep container tightly closed. Keep cool. Store locked up. Store away from incompatible materials (Section 10). Inspect all incoming containers to make sure they are properly labelled and not damaged. Storage area should be clearly identified, clear of obstruction and accessible only to trained personnel. Inspect periodically for damage or leaks.			
<b>Section 8. Exposure controls/Personal protection</b>			
<b>Control parameters (biological limit values or exposure limit values and source of those values)</b>			
Exposure limits: CAS 7647-01-0 – ACGIH – TLV-TWA 2 ppm (ceiling) & PEL-TWA 5 ppm (ceiling);			
<b>Appropriate engineering controls</b>			
Use under well-ventilated conditions. Local exhaust ventilation system is recommended to maintain concentrations of contaminants below exposure limits. Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area.			
<b>Individual protection measures/personal protective equipment</b>			
Respiratory protection is required if the concentrations are higher than the exposure limits. Use a NIOSH approved respirators if the exposure limits are unknown. Chemically protective gloves (impervious), and other protective clothing to prevent prolonged or repeated skin contact, must be worn during all handling operations. Wear protective chemical splash goggles to prevent mists from entering the eyes. Wash hands/nails/face thoroughly after handling. Do not eat, drink or smoke when using this product. Practice good personal hygiene after using this material. Remove and wash contaminated work clothing before re-use.			
<b>Section 9. Physical and chemical properties</b>			
<b>Appearance, physical state/colour</b>	Reddish brown liquid	<b>Vapour pressure</b>	Not available
<b>Odour</b>	Acid	<b>Vapour density</b>	Not available
<b>Odour threshold</b>	Not available	<b>Relative density</b>	1.26-1.48
<b>pH</b>	< 2	<b>Solubility</b>	Negligible
<b>Melting/freezing point</b>	105-110°C	<b>Partition coefficient - n-octanol/water</b>	Not available
<b>Initial boiling point/range</b>	Not available	<b>Auto-ignition temperature</b>	Not available
<b>Flash point</b>	Not available	<b>Decomposition temperature</b>	Not available
<b>Evaporation rate</b>	Not available	<b>Viscosity</b>	Not available
<b>Flammability (solids and gases)</b>	Not available	<b>VOC</b>	Not available
<b>Upper and lower flammability/explosive limits</b>	Not available	<b>Other</b>	None known

<b>Section 10. Stability and reactivity</b>	
<b>Reactivity</b>	
Does not react under the recommended storage and handling conditions prescribed.	
<b>Chemical stability</b>	
Stable under the recommended storage and handling conditions prescribed.	
<b>Possibility of hazardous reactions</b>	
When mixed with incompatible materials.	
<b>Conditions to avoid (static discharge, shock or vibration)</b>	
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.	
<b>Incompatible materials</b>	
Oxidizing materials; bases; etc.	
<b>Hazardous decomposition products</b>	
Hydrochloric acid (gas).	
<b>Section 11. Toxicological information</b>	
<b>Information on the likely routes of exposure (inhalation, ingestion, skin and eye contact)</b>	
Harmful if swallowed. Causes severe skin burns and eye damage. Harmful if inhaled. May cause respiratory irritation.	
<b>Symptoms related to the physical, chemical and toxicological characteristics</b>	
Skin burn, redness, stinging, pain; Eye burn, redness, tearing; Digestive tract burn; Respiratory tract burn, coughing, shortness of breath, dizziness, drowsiness, nausea and headaches.	
<b>Delayed and immediate effects (chronic effects from short-term and long-term exposure)</b>	
Skin Sensitization – No data available; Respiratory Sensitization – No data available; Germ Cell Mutagenicity – No data available; Carcinogenicity – No ingredient listed by IARC, ACGIH, NTP or OSHA Reproductive Toxicity – No data available; Specific Target Organ Toxicity — Single Exposure – Possible; Specific Target Organ Toxicity — Repeated Exposure – No data available; Aspiration Hazard – No data available; Health Hazards Not Otherwise Classified – No data available.	
<b>Numerical measures of toxicity (ATE; LD<sub>50</sub> &amp; LC<sub>50</sub>)</b>	
CAS 7647-01-0 LD <sub>50</sub> Oral - Rat – 238 mg/kg; LC <sub>50</sub> Inhalation - Rat - 4 h – 1562 ppm; LD <sub>50</sub> Dermal - Rabbit – no data; CAS 7705-08-0 LD <sub>50</sub> (oral, rat) 316 mg/kg; ATE not available in this document.	
<b>Section 12. Ecological information</b>	
<b>Ecotoxicity (aquatic and terrestrial information)</b>	No data available
<b>Persistence and degradability</b>	No data available
<b>Bioaccumulative potential</b>	No bioaccumulation is to be expected.
<b>Mobility in soil</b>	No data available
<b>Other adverse effects</b>	No data available
<b>Section 13. Disposal considerations</b>	
<b>Information on safe handling for disposal/methods of disposal/contaminated packaging</b>	
Dispose of contents/container into safe container in accordance with local, regional or national regulations.	
<b>Section 14. Transport information</b>	
<b>UN number; Proper shipping name; Class(es); Packing group (PG) of the TDG Regulations</b>	
UN2582; FERRIC CHLORIDE SOLUTION; CLASS 8; PG III	
<b>UN number; Proper shipping name; Class(es); Packing group (PG) of the IMDG (maritime)</b>	
UN2582; FERRIC CHLORIDE SOLUTION; CLASS 8; PG III	
<b>UN number; Proper shipping name; Class(es); Packing group (PG) of the IATA (air)</b>	
UN2582; FERRIC CHLORIDE SOLUTION; CLASS 8; PG III	
<b>Special precautions (transport/conveyance)</b>	May also be shipped as a LIMITED QUANTITY in accordance with TDG.
<b>Environmental hazards (IMDG or other)</b>	None
<b>Bulk transport (usually more than 450 L in capacity)</b>	Possible
<b>Section 15. Regulatory information</b>	
<b>Safety/health Canadian regulations specifics</b>	Refer to Section 2 for the appropriate classification. This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR).
<b>Environmental Canadian regulations specifics</b>	Refer to Section 3 for ingredient(s) of the DSL
<b>Safety/health/environmental outside regulations specifics</b>	
United States OSHA information: This product is regulated according to OSHA (29 CFR).	
United States EPA (Environmental Protection Agency) information: 40 CFR Refer to the ingredients listed in Section 3 & Sections 12; 13 & 14.	
United States TCSA information: Refer to the ingredients listed in Section 3.	
National Fire Protection Association (NFPA):	
HEALTH: 3    FLAMMABILITY: 0    INSTABILITY: 0    SPECIAL HAZARDS: Refer to Section 2 & 3.	
HAZARD SCALE: 0 = Minimal    1 = Slight    2 = Moderate    3 = Serious    4 = Severe	

**Section 16. Other information**

**Date of the latest revision of the safety data sheet** | November 25, 2016 version 1 (NSS ENTREPRISE INC.)

**References** | Safety Data Sheets from manufacturer/supplier & from Canadian Centre for Occupational Health and Safety, CCOHS.

**Abbreviations**

ACGIH	American Conference of Governmental Industrial Hygienists
ATE	Acute toxicity estimate
CAS	Chemical Abstract Service
DSL	Domestic Substance List
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods Code
LC	Lethal concentration
LD	Lethal Dosage
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program (U.S.A.)
OSHA	Occupational Safety and Health Administration (U.S.A.)
PEL	Permissible Exposure Limit
STEL	Short-term Exposure Limit
TDG	Transport of dangerous goods in Canada
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
WHMIS	Workplace Hazardous Materials Information System

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.