

SECTION 1 - PRODUCT IDENTIFICATION

Product identifier/Trade name: FERRIC CHLORIDE
Product code/Internal Identification: AE120
Product use/Description: Cleaner used for etching copper boards and other metals in 1 L containers.
Product chemical name: N/Av
Chemical family: N/Av
MSDS preparation/review date: February 22, 2012
Supplier identifier: Asalco Inc.
44, ch. Des Ursulines, Stanstead, Québec (Canada), J0B 3E0
Telephone 819-876-2211 Fax 819-876-5373 Internet www.asalco.com
Emergency phone number: (613) 996-6666 (CANUTEC)
Manufacturer identifier: Same as supplier
Emergency phone number: Same as supplier
WHMIS Classification: E – Corrosive liquid
D1A – Toxic material with immediate and serious toxic effects

SECTION 2 - CHEMICAL COMPOSITION / HAZARDOUS INGREDIENTS

Hazardous Ingredients	CAS #	% (weight)	LD ₅₀ (route, specie)	LC ₅₀ (specie)
Ferric chloride	7705-08-0	30-60	316 mg/kg (oral, rat)	N/Av
Hydrochloric acid	7647-01-0	1-5	N/Av	1562 ppm 4 hours (rat)

SECTION 3 - HAZARDS IDENTIFICATION**Emergency Overview**

CORROSIVE LIQUID. Causes skin and eye irritations or burns. May cause respiratory or digestive tract irritations or burns. Prolonged or excessive inhalation and/or ingestion may cause permanent damage to respiratory and digestive tract.

POTENTIAL HEALTH EFFECTS (for more details, refer to Section 11)

Primary entry route(s): Skin, eye, ingestion and inhalation.

Effects of short-term (acute) and long-term (chronic) exposure:

Inhalation:

May cause respiratory tract irritations or burns. Prolonged or excessive inhalation may cause permanent damage to respiratory tract.

Skin:

Causes moderate skin irritations or burns. Repeated or prolonged contact may cause permanent damage.

Eye:

Causes moderate eye irritations or burns. Repeated or prolonged contact may cause permanent damage.

Ingestion:

May cause digestive tract irritations or burns. Prolonged or excessive ingestion may cause permanent damage to digestive tract.

SECTION 4 - FIRST AID MEASURES**Inhalation:**

Remove source of contamination or have victim move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Obtain medical attention immediately.

Skin contact:

Flush contaminated area with lukewarm, gently running water for at least 20 minutes or until the chemical is removed. Under running water, remove contaminated clothing. If irritation persists, obtain medical advice. Completely decontaminate clothing before reuse or discard.

Eye contact:

Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 20 minutes, or until the chemical is removed, while holding the eyelid(s) open. Obtain medical attention immediately.

Ingestion:

NEVER give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink two glasses of water. Obtain medical attention immediately.

SECTION 5 - FIRE FIGHTING MEASURES

Fire hazards/conditions of flammability: Does not burn under normal handling conditions.

Flash point (Method): N/Ap

Lower flammable limit (% by volume): N/Av

Upper flammable limit (% by volume): N/Av

Sensitivity to mechanical impact: N/Av

Sensitivity to static discharge: N/Av

Auto-ignition temperature: N/Av

Suitable extinguishing media:

Carbon dioxide, dry chemical powder and appropriate foam for surrounding products.

Special fire-fighting procedures/equipment:

During a fire, irritating/toxic smoke and fumes may be generated. Vapours can accumulate in confined spaces, resulting in a toxicity and flammability hazard. A self-contained breathing apparatus is required for fire-fighting personnel to protect themselves from toxic products produced during the combustion. Closed containers may explode with the pressure building from the heat. Use water to cool fire exposed containers and prevent this situation.

Hazardous combustion products:

Carbon monoxide, carbon dioxide and other irritant gases, which may include toxic constituents. Hydrogen chloride and Phosgene.

SECTION 6 - ACCIDENTAL RELEASE MEASURES**Personal precautions:**

Restrict access to area until completion of clean-up. Ensure clean-up is conducted by trained personnel only. Remove all ignition sources. Remove or isolate flammable and combustible materials. Wear adequate personal protective equipment (See Section 8). Ventilate area.

Spill response/Cleanup:

Stop the flow if it can be done safely. Keep materials which can burn away from spilled material. Prevent material from entering waterways, sewers or confined spaces. Put material in suitable, covered, labelled containers.

Environmental precautions:

Confine spill, preventing it from entering sewer lines or waterways. Dispose of as per local, state and federal regulations.

SECTION 7 - HANDLING AND STORAGE**Safe handling procedures:**

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. Do not use near welding operations, flames or hot surfaces. Ensure proper ventilation after sealed area has been treated. Inspect containers for leaks before handling. Label containers appropriately. Keep containers closed when not in use. Empty containers are always dangerous. Assume that empty containers contain residues which are hazardous. Do not use with incompatible materials.

Storage requirements:

Store in a cool, well-ventilated area, away from heat and ignition sources. Keep storage area clear of ignition sources. Store away from incompatible materials. Inspect all incoming containers to make sure they are properly labelled and not damaged. Store in suitable, labelled containers. Keep containers tightly closed. Empty containers are always dangerous. Storage area should be clearly identified, clear of obstruction and accessible only to trained personnel. Inspect periodically for damage or leaks.

SECTION 8 - EXPOSURE CONTROLS AND PERSONAL PROTECTION**Engineering controls:**

None required under normal handling conditions. Local exhaust ventilation system is recommended to maintain concentrations of contaminants below exposure limits.

Respiratory Protection:

None required under normal handling conditions. Respiratory protection is required if the concentrations are higher than the exposure limits. Use a NIOSH approved respirator if the exposure limits are unknown.

Protective Clothing/Equipment:

Wear chemically protective gloves (impervious), and if necessary boots, aprons, and gauntlets to prevent prolonged or repeated skin contact. Wear protective chemical safety goggles or in a splash environment in combination with a face shield. Make emergency eyewash stations, safety/quick-drench showers, and washing facilities available in work area. Separate contaminated work clothes from street clothes. Launder before reuse.

Comments:

Avoid contact with skin and eyes. Avoid breathing vapours/dusts. Never eat, drink, or smoke in work areas. Practice good personal hygiene after using this material.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Physical state, colour and odour: Reddish brown liquid with slight pungent odour.

Odour threshold: N/Av

pH: < 2

Boiling point: 105-110°C

Melting/freezing point: N/Av

Vapour pressure: Negligible

Solubility in water: Soluble

Coefficient of oil/water distribution: N/Av

Specific gravity or density (water = 1, at 4 °C): 1.26-1.48

Vapour density: N/Av

Evaporation rate: N/Av

% volatile by volume: N/Av

SECTION 10 - REACTIVITY AND STABILITY DATA

Stability and reactivity:

Stable at room temperature, in normal handling and storage conditions.

Polymerisation: Hazardous polymerisation will not occur.

Conditions to avoid:

Avoid STRONG OXIDIZING AGENTS AND BASES. Corrosive to most metals. Keep away from static discharge, sparks, open flames, heat and other ignition sources.

Materials to avoid:

Avoid STRONG OXIDIZING AGENTS AND BASES. Corrosive to most metals.

Hazardous decomposition products:

None.

SECTION 11 - TOXICOLOGICAL INFORMATION

Exposure limits: N/Av for the product.

Ingredient	OSHA PEL		ACGIH TLV		Other exposure limits
	TWA	Ceiling	TWA	Ceiling	
Ferric chloride	N/Av	N/Av	N/Av	N/Av	N/Av
Hydrochloric acid	N/Av	5 ppm	N/Av	2 ppm	N/Av

For more details, refer to Section 3.

Carcinogenicity:

No ingredient listed by IARC, ACGIH, NTP or OSHA as a carcinogen.

Teratogenicity, mutagenicity, other reproductive effects: N/Av

Skin sensitization: N/Av

Respiratory tract sensitization: N/Av

Synergistic materials: N/Av

SECTION 12 - ECOLOGICAL INFORMATION

Environmental effects: N/Av

Important environmental characteristics: N/Av

Aquatic toxicity: N/Av

SECTION 13 - WASTE DISPOSAL

Handling and storage conditions for disposal:

Store material for disposal as indicated in Handling and Storage (Section 7).

Methods of disposal:

Review federal, provincial and local government requirements prior to disposal. Disposal by controlled incineration or secure landfill may be acceptable.

SECTION 14 - TRANSPORTATION INFORMATION

Transportation of Dangerous Goods (TDG) :

TDG Classification: FERRIC CHLORIDE SOLUTION; Class 8; UN2582; III

Special case: Product can also be shipped as a LIMITED QUANTITY/CONSUMER COMMODITY according to TDG Section 1.17.

SECTION 15 - REGULATORY INFORMATION**In Canada****WHMIS information:**

Product is regulated according to the Controlled Product Regulations (CPR) in Canada.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and this MSDS contains all the information required by the CPR.

Hazardous Materials Identification System (HMIS):

HEALTH: 3 FLAMMABILITY: 0 REACTIVITY: 0 PERSONAL PROTECTION: Section 8.

HAZARD: 0 Minimal 1 Slight 2 Moderate 3 Serious 4 Severe

National Fire Protection Association (NFPA):

HEALTH: 3 FLAMMABILITY: 0 REACTIVITY: 0 PERSONAL PROTECTION: Section 8.

HAZARD: 0 Minimal 1 Slight 2 Moderate 3 Serious 4 Severe

SECTION 16 - OTHER INFORMATION

Prepared by: NSS ENTREPRISE INC. for Asalco Inc.

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References:

1. Material Safety Data Sheets from manufacturer/supplier.
2. CSST, Répertoire Toxicologique, Les produits, 2012.
3. Canadian Centre for Occupational Health and Safety, CCInfoWeb databases, 2012.

Abbreviations:

ACGIH	American Conference of Governmental Industrial Hygienists
CAS	Chemical Abstract Service
CFR	Code of Federal Regulations (Transportation in U.S.A.)
DOT	Department of Transport (U.S.A.)
DSL	Domestic Substance List
IARC	International Agency for Research on Cancer
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
TLV	Threshold Limit Value
TSCA	Toxic Substances Control Act
TWA	Time Weighted Average
USEPA	United States Environmental Protection Agency
WHMIS	Workplace Hazardous Materials Information System

End of the MSDS