LIQUID TIN **421-LIQUID**

Safety Data Sheet

Section 1: Product and Company Identification

Product Identifier and Other Means of Identification

Product Name: Liquid Tin **SDS Code:** 421

Related Part #: 421-125ML, 421-500ML

Recommended Use and Restriction on Use

Use: Electroless tin plating solution

Uses Advised Against: Not available

Details of Manufacturer or Importer

Manufacturer

MG Chemicals
1210 Corporate Drive
Burlington, Ontario L7L 5R6
CANADA

☎ +1-800-340-0772
FAX +1-800-340-0773
E-MAIL: support@mgchemicals.com
WEB www.mgchemicals.com

MG Chemicals (Head Office)
9347-193 Street
Surrey, British Columbia V4N 4E7
CANADA

☎ +1-905-331-1396
FAX +1-905-331-2682
E-MAIL: info@mgchemicals.com

E-MAIL (Competent Person): sds@mgchemicals.com

Emergency Phone Number

For hazardous material incidents ONLY—leaks, spills, fires, exposures or accidents
USA or CANADA: Call CHEMTREC ☎: ***+1-800-424-9300***

For emergencies involving dangerous goods; Collect 24/7
CANADA: Call CANUTEC ☎: ***+1-613-996-6666*** or ****666*** on cellular phones

Section 2: Hazards Identification

Classification of Hazardous Chemical

GHS Categories

Criteria		Category	Signal Word	Pictograms
Serious Eye Damage		1	Danger	Corrosion
Skin Corrosion		1	Danger	Corrosion
Metal Corrosion		1	Warning	Corrosion
Reproductive Toxicity		2	Warning	Health
Carcinogenicity		2	Warning	Health
Sensitization	Skin sensitizer	1	Warning	Exclamation
Acute Toxicity	Oral	4	Warning	Exclamation

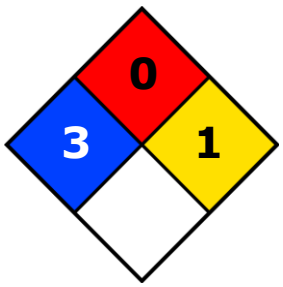
Note: The degree of severity is ranked within each hazard class from 1 (Highest Severity) to up to 5 (Lowest Severity), which is opposite to HMIS and NFPA conventions. Severity category rankings do not allow comparisons between classes.

Other Classifications

HMIS® RATING

HEALTH:	* 3
FLAMMABILITY:	0
PHYSICAL HAZARD:	1
PERSONAL PROTECTION:	

NFPA® 704 CODES



Approximate HMIS and NFPA Risk Ratings Legend:
0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

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Label Elements

Signal Word	**DANGER**
Pictograms	**Hazard Statements**
	H314: Causes severe skin burns and eye damage H290: May be corrosive to metals
	H360: May damage fertility or the unborn child H351: Suspected of causing cancer
	H317: May cause an allergic skin reaction H302: Harmful if swallowed

Prevention	**Precautionary Statements**
P102	Keep out of reach of children.
P201 + P202	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.
P260	Do not breathe dust or mists.
P264	Wash hands thoroughly after handling.
P280	Wear protective gloves/eye protection/face protection. Keep only in original packaging.
P270	Do not eat, drink or smoke when using this product.
P272	Contaminated work clothing should not be allowed out of the workplace.
P273	Avoid release to the environment.

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Response	Precautionary Statements
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTRE/doctor.
P303 + P361 + 353, P310	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
P363	Wash contaminated cloathing before reuse.
P362 + P364	If skin irritation or rash occurs: Get medical attention.
P301 + P330 + P353, P310	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTRE/doctor.
P304 + P340, P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTRE/doctor.
P308 + P313	IF exposed or concerned: Get medical advice/attention.
P390	Absorb spillage to prevent material damage
Storage	**Precautionary Statements**
P405	Store locked up.
P406	Store in corrosion resistant container with a resistant inner liner.
Disposal	**Precautionary Statements**
P501	Dispose of contents/container in accordance to local/regional/international regulations.

Other Hazards

Not applicable.

Section 3: Hazardous Ingredients

CAS #	Chemical Name	Wt%
7732-18-5	water	60–85%
16872-11-0	fluoroboric acid	9–11%
13814-97-6	tin fluoroborate	9–11%
62-56-6	thiourea	4–6%

Section 4: First Aid Measures

Exposure Condition	*GHS Code/Symptoms/Precautionary Statements*
IF IN EYES	P305 + P351 + P338, P310
Immediate Symptoms	*redness, pain, blurred vision, and severe irritations/burns*
Response	Rinse cautiously with water for at least 60 minutes. Remove contact lenses, if present and easy to do. Continue rinsing (also rinse during transport to hospital). Immediately call a POISON CENTRE/doctor.
IF ON SKIN (or hair)	P303 + P361 + P363 + P353, P333 + P313
Immediate Symptoms	*redness, severed irritation, pain, and possible burns, blisters*
Response	Take off immediately contaminated clothing and wash it before reuse. Wash with plenty of water. Immediately call a POISON CENTRE/doctor. If you feel unwell or skin irritation occurs: Get medical advice/attention.
IF INHALED	P304 + P340, P310 (Unlikely route unless processing creates mist or dust form)
Immediate Symptoms	*cough, irritation of the respiratory track*
Delayed Symptoms	*difficulty breathing due to excess fluid in the lungs (pulmonary edema)*
Response	Remove person to fresh air (out of the contaminated zone) and keep comfortable for breathing Immediately call a POISON CENTRE/doctor. If exposed or concerned: Get medical advice/attention.
IF SWALLOWED	P301 + P330 + P331, P310
Immediate Symptoms	*mouth burns, burning sensation in throat and chest, abdominal pain, nausea, vomiting, shock or collapse*
Response	Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTRE/doctor If feeling unwell or concerned: Get medical attention.

Section 5: Fire Fighting Measures

Auto-ignition Temperature	Not available	**Flash Point**	Not availalbe	**LFL [LEL]** a) **UFL [UEL]**	Not applicable

In case of fire	P370 + P378
Extinguishing Media	Will not burn. Use extinguish media suitable for surrounding. You may use carbon dioxide, dry chemical, water spray, or foam media.
Specific Hazards	In a fire, this product can release toxic fumes and gases.
Combustion Products	Produces CO and CO_2, boron oxides, boron trifluorides, sulfur oxides (SO_x), hydrogen fluoride (HF), stannous fluoroborate
Fire-Fighter	Wear self-contained breathing apparatus for fire fighting

a) LFL = Lower Flammability [or Explosion] Limit (in volume %);
UFL = Upper Flammability [or Explosion] Limit (in volume %)

Section 6: Accidental Release Measures

Personal Protection	See Section 8. Wear appropriate personal protection. Ensure adequate ventilation.
Containment	Avoid release to the environment. Prevent spill from entering drains and waterways.
Cleaning	Sprinkle inert absorbent compound (sand, diatomite, acid binders, universal binders) onto spill, then sweep into a corrosion resistant (plastic) waste container. Wash spill area with soap and water to remove the last traces of residue.
Disposal	Dispose of spill waste according to Section 13.

Section 7: Handling and Storage

Prevention

Keep out of reach of children.

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood.

Do not get in eye, on skin, or on clothing.

Do not breathe mist/spray.

Do not eat, drink, or smoke when using this product.

Handling

Wear protective gloves/clothing/eye protection.

Wash hands thoroughly after handling.

Avoid release to the environment.

Storage

Do not store together with acids.

Keep tightly closed.

Store locked up.

Section 8: Exposure Controls/Personal Protection

Routes of Entry

Eyes, ingestion, inhalation

Substances with Occupational Exposure Limit Values

Chemical Name	Country	Long Term Exposure Limits (PEL)	Short Term Exposure Limits (STEL)
Tin and its inorganic compounds: *Tin fluoroborate*	ACGIH U.S.A. OSHA PEL Canada AB Canada BC Canada ON Canada QC	2 mg/m^3 2 mg/m^3 2 mg/m^3 2 mg/m^3 2 mg/m^3 2 mg/m^3	Not established Not established Not established Not established Not established Not established

Note: The ACGIH[1], OSHA (Table Z-1), and Canadian provinces exposure limits were consulted. Limits from by RTECS database[2] of the Canadian Centre for Occupational Health and Safety (CCOHS) a data from suppliers' SDS were also consulted. Short term exposure limits (STEL) are for 15 min and long term permissible exposure limits (PEL) for 8 h.

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Engineering Controls

Ventilation	Keep airborne concentrations below exposure limits.

Personal Protective Equipment

Eye protection	Wear appropriate protective eyeglasses or chemical safety goggles.
Skin Protection	Use of protective gloves chemically resistant gloves.
	Recommendation: For prolonged contact, use of protective gloves in butyl rubber, chloroprene, latex, or other chemically resistant gloves with a minimum thickness of 0.6 mm.
	For incidental exposure, you may use nitrile gloves with minimum thickness ≥ 0.1 mm.
Respiratory Protection	If exposed to mist or fumes above the exposure limit, a suitable wear respirator meeting local/regional/national guidelines.
	RECOMMENDATION: Consult your local safety supply store to ensure your respirator has filter cartridges appropriate for the ingredients listed in section 3. Ensure that the respirator is fitted to the employee by a professional.

General Hygiene Considerations

Wash hands thoroughly with water and soap after handling.

Section 9: Physical and Chemical Properties

Physical State	Liquid	**Lower Flammability Limit**	Not available
Appearance	Clear	**Upper Flammability Limit**	Not available
Odor	Pungent	**Vapor Pressure @20 °C**	Not available
Odor Threshold	Not available	**Vapor Density** [a)]	17 mmHg [23 hPa]
pH	<1	**Specific Gravity @25 °C**	1.12
Freezing/Melting Point	Not available	**Solubility in Water**	Soluble
Boiling Point [a)]	>100 °C [>212 °F]	**Partition Coefficient**	Not available
Flash Point	Not applicable	**Auto-ignition Temperature**	Not available
Evaporation Rate	Not available	**Decomposition Temperature**	Not available
Flammability (solid, gas)	Not available	**Viscosity @40 °C**	Not availalable

a) Based on water component

Section 10: Stability and Reactivity

Reactivity	Not available.
Chemical Stability	Chemically stable at normal temperatures and pressures
Conditions to Avoid	Formation of mist or dust, and temperatures above 140 °C.
Incompatibilities	strong bases, strong oxidizing agents, and water incompatible substances like alkali or alkali earth metals.
Polymerization	Will not occur
Decomposition	Will not decompose under normal conditions. For thermal decomposition, see combustion products in Section 5

Section 11: Toxicological Information

Routes of Exposure

Eye, ingestion, inhalation

Symptoms Summary

Eyes	May cause redness, pain, blurred vision, and severe irritations/burns
Skin	May causes severe skin irritation, allergic skin reaction, pain, burns, and blisters
Inhalation	May cause nose, throat and lung irritation and possible burns. May cause delayed difficulty breathing due to pulmonary adema (excess fluid in lungs). Overexposure to dust or metal fumes may lead to pneumoconiosis (or Stannosis)
Ingestion	mouth burns, burning sensation in throat and chest, abdominal pain, nausea, vomiting. Harmful if swallowed.
Chronic	Ingestion or inhalation may have developmental or carcinogenic effects.

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Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD50 oral	LD50 dermal	LC50 inhalation	TCLo inhalation
fluoroboric acid	100 mg/kg Rat	Not available	Not available	Not available
tin fluoroborate	130 mg/kg Rat [a)]	>2000 mg/kg Rabbit [a)]	Not available	Not available
thiourea	>2000 mg/kg Rat [a)]	>2000 mg/kg Rabbit [a)]	Not available	Not available

Note: Representative toxicity from RTECS database of the Canadian Centre for Occupational Health and Safety (CCOHS)[1] data from supplier MSDS were consulted.
a)Because data from the main sources were inconclusive, the toxicity data from the ECHA database was used instead.

Other Toxicological Effects

Skin corrosion/irritation — Causes severe skin burns or irritation.

Serious eye damage/irritation — Causes serious eye damage or irritation.

Sensitization (allergic reactions) — Tin fluoroborate [CAS# 13814-97-6] is a known skin sensitizer.

Carcinogenicity (risk of cancer) — Carcinogen based on animal studies and North American guidelines and regulation.

Thiourea[CAS# 62-56-6]

IARC Group 2B: Possibly carcinogenic to humans

ACGIH A3: Not classifiable as to its carcinogenicity to humans

CA Prop 65: Listed as Carninogen

NTP: Reasonably anticipated to be a human carcinogen

Mutagenicity (risk of heritable genetic effects) — No effects known

Reproductive Toxicity (risk to sex functions) — Thiourea is believed to decrease fertility in males and females based on animal studies.

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Teratogenicity (risk of fetus malformation)	Thiourea may presents a developmental hazard based on animal studies.
STOT-single exposure	No effects known
STOT-repeated exposure	No effects known
Aspiration hazard	Not applicable. This product doesn't contain any Cat 1 ingredients.

Section 12: Ecological Information

Thiourea is an acute category 2 environmental toxicant (rapidly biodegradable, with minimal LC50 of 10 mg/L 96 h for Danio rerio (zebra fish); EC50 of ≥5.6 mg/L 48 h Daphnia magna (water flea); EC50 of 6.8 mg/L 96 h Desmodesmus subspicatus (green algae)).

Water, fluoroboric acid, and tin fluoroborate have no know ecotoxicty effect or data is not available.

Acute Ecotoxicity

Not classifiable as an acute toxicant under GHS

Chronic Ecotoxicity

Not classifiable as a chronic toxicant under GHS

Biodegradability

Non biodegrable.

Other Effects

Not available

Section 13: Disposal Information

Dispose of contents in accordance with all local, regional, national, and international regulations. Contaminated absorbent material and other contaminated materis must be disposed in an approved waste disposal facility. If possible, recover and reuse is recommended.

Section 14: Transport Information

Ground

Refer to TDG regulations (Canadian Transportation of Dangerous Goods regulations); **USA 49CFR Regulations** (Parts 100 to 185).

Sizes 1 liter and under

Limited Quantity

Sizes greater than 1 liter

UN number: UN1775
Shipping Name:
FLUOROBORIC ACID
Class: 8
Packing Group: II
Marine Pollutant: No

Air

Refer to ICAO-IATA Dangerous Goods Regulations.

Sizes 0.5 liter and under

Limited Quantity
Max. Net Qty/Pkg
0.5 L

Packing Instr. Y840

Sizes greater than 0.5 to 1 liter

UN number: UN1775
Shipping Name:
FLUOROBORIC ACID
Class: 8
Packing Group: II
Marine Pollutant: No
Packing Instr. 851 (Max Net Qty: 1 L).

NOTE: Avoid shipping by air if possible.

Sea

Refer to IMDG regulations.

Sizes 1 liter and under

Limited Quantity

Sizes greater than 1 liter

UN number: UN1775
Shipping Name:
FLUOROBORIC ACID
Class: 8
Packing Group: II
Marine Pollutant: No

Note: **Shipper must be appropriately <u>trained and certified</u> before involvement with the transport of dangerous goods.**

Section 15: Regulatory Information

Canada

WHMIS Classification

E – Corrosive; D1B Immediately Toxic (Skin Absorption); D2B – Toxic Material (Skin Sensitization in Humans)

Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL)

All hazardous ingredients are listed on the DSL/NDSL.

Industry and Science Canada

MG Labels products intended for the workplace to conform to WHMIS labeling regulations. Product identification, net quantity declaration, minimum printing type size heights, and packaging of this product are in compliance.

Health Canada

Products produced by MG Chemicals intended for retail display conform to the Canadian Consumer Labeling Regulations.

USA

CAA (Clean Air Act, USA)

This product does not contain any class 1 ozone depleting substances.

This product does not contain any class 2 ozone depleting substances.

This product does not contain substances that are listed as hazardous air pollutants.

EPCRA (Emergency Planning and Right to Know Act, USA, 40 CFR 372.45

This product contains thiourea (CAS# 7439-92-1; reportable quantity = 10 lb), which is subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

TSCA (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity, Sept 2, 2011 revision, USA).

This product contain thiourea, which is listed as a carcinogen.

Europe

RoHS

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

WEEE

This product is subject to the WEEE regulation.

Section 16: Other Information

MSDS Prepared by Michel Hachey

Date of Issue 06 June 2014

Supersedes 16 October 2013

Reason for Changes: Change to OSHA GHS format.

Continued on the next page

Reference

1) ACGIH *2013 TLVs and BEIs: Based on the documentation of the threshold limit values for chemical substances and physical agents & biological exposure indices*, American Conference of Governmental of Industrial Hygienist Cincinnati, OH (2013).

2) All toxicological data were checked against the RTECS (Registry of Toxic Effects of Chemical Substances®)

Abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists (USA)
EC50	Half maximal effective concentration
EL50	Half maximal effective loading
NOELR	No observable effect loading ratio
GHS	Globally Harmonized System of Classification of Labeling of Chemicals
LC50	Lethal Concentration 50%
LCLo	Lowest published lethal concentration
LD50	Lethal Dose 50%
PEL	Permissible Exposure Limit
STEL	Short-Term Exposure Limit
TCLo	Lowest published toxic concentration
TWA	Time Weighted Average
VOC	Volatile Organic Content

Technical Queries Contact us regarding any questions, improvement suggestions, or problems with this product. Application notes, instructions, and FAQs are located at www.mgchemicals.com.

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