SAFETY DATA SHEET

SECTION 1. IDENTIFICATION

Paul H. Gesswein & Co., Inc.
201 Hancock Ave., Bridgeport, CT 06605
Phone: 203-366-5400, FAX: 203-366-3953
email: info@gesswein.com, **www.gesswein.com**

Product Name: Umicore RUTHUNA® 475 Black Initial Concentrate - 2g

Product Number: 210-1036

Emergency phone number: CHEMTELL - 800-255-3924

Manufacturer or supplier's details

Company name of supplier	:	Uyemura International Corporation
Address	:	Uyemura International Corporation 240 Town Line Road 06489 Southington, CT USA
Telephone	:	860-793-4011
Telefax	:	+497171607316
E-mail address of person responsible for the SDS	:	info.ipds@umicore.com

Poison Center

Telephone	:	+1 800 222 1222
Hours of operation	:	24HRS

Supplier

Emergency telephone number	:	For transport in Europe, Central- and South America, Israel and Africa (Non-Arabic speaking countries):(+32) 3 213 15 70 For transport in the Middle East (Israel excluded) & Arabic speaking Africa:(+32) 3 213 33 79 For transport in the USA and Canada:(+1)-877 986 4267 For transport in Asian and the Pacific (China excluded):(+65) 62 64 78 36 For transport in China:(+86) 400 88 71 190
Hours of operation	:	This telephone number is available 24 hours per day, 7 days per week.

Recommended use of the chemical and restrictions on use

Recommended use	:	Electroplating

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Corrosive to metals	:	Category 1

Skin corrosion	:	Category 1
Serious eye damage	:	Category 1

GHS label elements

Hazard pictograms :

Signal word	:	Danger
Hazard statements	:	H290 May be corrosive to metals. H314 Causes severe skin burns and eye damage.

Precautionary statements :

Prevention:

P234 Keep only in original container.
P264 Wash skin thoroughly after handling.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310 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 CENTER/doctor.
P363 Wash contaminated clothing before reuse.
P390 Absorb spillage to prevent material damage.

Storage:

P405 Store locked up.
P406 Store in corrosive resistant container with a resistant inner liner.

Disposal:

P501 Dispose of contents/ container to an approved waste disposal plant.

Additional Labelling

The following percentage of the mixture consists of ingredient(s) with unknown acute toxicity: 3.6 %

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (% w/w)
Sulphuric acid	7664-93-9	<=20
ruthenium trichloride	10049-08-8	<=3.6

SECTION 4. FIRST AID MEASURES

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled : If unconscious, place in recovery position and get medical attention immediately.

In case of skin contact : If on skin, rinse well with water.
If on clothes, remove clothes.
Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
Wash contaminated clothing before reuse.

In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
Remove contact lenses.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Protect unharmed eye.
Keep eye wide open while rinsing.

If swallowed : Clean mouth with water and drink afterwards plenty of water.
Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

Most important symptoms and effects, both acute and delayed : Skin contact may provoke the following symptoms:
Burn
corrosive effects
Redness
In case of eye contact
Excessive lachrymation

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media : Use extinguishing measures that are appropriate to local cir-

cumstances and the surrounding environment.

Unsuitable extinguishing media	:	High volume water jet
Specific hazards during fire-fighting	:	Cool closed containers exposed to fire with water spray. In the presence of fire, note caustic and corrosive effect. Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Sulphur oxides Metal oxides Chlorine compounds
Further information	:	Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
Special protective equipment for firefighters	:	No special protective equipment required.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	:	Use personal protective equipment. Evacuate personnel to safe areas.
Environmental precautions	:	Prevent product from entering drains. Prevent further leakage or spillage if safe to do so. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	:	Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion	:	Normal measures for preventive fire protection.
Advice on safe handling	:	Do not breathe vapours/dust. Avoid contact with skin and eyes. For personal protection see section 8. Smoking, eating and drinking should be prohibited in the application area.
Conditions for safe storage	:	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Electrical installations / working materials must comply with

the technological safety standards.
To maintain product quality, do not store in heat or direct sunlight.

Materials to avoid : Keep away from strong bases.
Keep away from metals.

Further information on storage stability : Keep in a dry place.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Sulphuric acid	7664-93-9	TWA (Thoracic fraction)	0.2 mg/m3	ACGIH
		TWA	1 mg/m3	NIOSH REL
		TWA	1 mg/m3	OSHA Z-1
		TWA	1 mg/m3	OSHA P0
ruthenium trichloride	10049-08-8	TWA	10 mg/m3	ACGIH
		TWA	3 mg/m3	ACGIH
		TWA	3 mg/m3	ACGIH

Engineering measures : Handle only in a place equipped with local exhaust (or other appropriate exhaust).

Personal protective equipment

Hand protection
- Material : Nitrile rubber
- Break through time : > 30 min
- Glove thickness : 0.40 mm

Eye protection : Wear face-shield and protective suit for abnormal processing problems.
Wear safety glasses with side shields or goggles.

Skin and body protection : Impervious clothing
Footwear protecting against chemicals

Hygiene measures : Avoid contact with skin, eyes and clothing.
General industrial hygiene practice.
Wash hands before breaks and immediately after handling the product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid

Colour	:	brown
pH	:	< 1
Flash point	:	does not flash
Flammability (liquids)	:	Does not sustain combustion.
Relative density	:	1.14 - 1.18
Density	:	1.14 - 1.18 g/cm3
Metal corrosion rate	:	Corrosive to metals

SECTION 10. STABILITY AND REACTIVITY

Chemical stability	:	Decomposes on heating. pressure build-up No decomposition if stored and applied as directed.
Possibility of hazardous reactions	:	Stable under recommended storage conditions.
Conditions to avoid	:	Extremes of temperature and direct sunlight.
Incompatible materials	:	Strong bases

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method
Acute dermal toxicity	:	Remarks: No data available

Components:

Sulphuric acid:

Acute oral toxicity	:	LD50 (Rat): 2,140 mg/kg
Acute inhalation toxicity	:	Assessment: The substance or mixture has no acute inhalation toxicity
Acute dermal toxicity	:	Assessment: The substance or mixture has no acute dermal toxicity

ruthenium trichloride:

Acute oral toxicity	:	Assessment: The component/mixture is moderately toxic after

single ingestion.

Acute inhalation toxicity : Assessment: No data available

Acute dermal toxicity : Assessment: No data available

Skin corrosion/irritation

Product:

Remarks : Extremely corrosive and destructive to tissue.

Components:

Sulphuric acid:

Result : Corrosive after 3 minutes or less of exposure
Remarks : data waiving in REACH dossier

Serious eye damage/eye irritation

Product:

Remarks : May cause irreversible eye damage.

Components:

Sulphuric acid:

Species : Rabbit
Result : Irreversible effects on the eye

ruthenium trichloride:

Result : Irreversible effects on the eye

Respiratory or skin sensitisation

Product:

Remarks : No data available

Germ cell mutagenicity

Product:

Genotoxicity in vitro : Remarks: No data available

Components:

Sulphuric acid:

Genotoxicity in vitro : Test Type: Ames test
Test system: Salmonella typhimurium TA98, TA100, TA1535, TA1537
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

GLP: yes
Remarks: Based on read across from structural related substance

Test Type: Ames test
Test system: Salmonella typhimurium TA97, TA98, TA100, TA102, TA 1535
Metabolic activation: with and without metabolic activation
Method: No guideline followed
Result: negative
GLP: no

Carcinogenicity

Product:

Remarks : No data available

Components:

Sulphuric acid:

Species	:	Rat, male and female
Application Route	:	oral (gavage)
Method	:	No guideline followed
Symptoms	:	Some evidence of a weak local carcinogenic activity
GLP	:	no

Species	:	Mouse, male and female
Application Route	:	oral (gavage)
Method	:	No guideline followed
Symptoms	:	Some evidence of a weak local carcinogenic activity
GLP	:	no

IARC Group 1: Carcinogenic to humans
Sulphuric acid 7664-93-9
(Acid mists, strong inorganic)

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP Known to be human carcinogen
Sulphuric acid 7664-93-9
(Strong Inorganic Acid Mists Containing Sulfuric Acid)
Known to be human carcinogen
Sulphuric acid 7664-93-9

Reproductive toxicity

Product:

Effects on fertility : Remarks: No data available

Components:

Sulphuric acid:

Effects on foetal development	:	Test Type: Developmental toxicity study Species: Rabbit Strain: NZW Application Route: inhalation (aerosol) Dose: 0, 5, 20 mg/m³ Duration of Single Treatment: 12 d General Toxicity Maternal: NOAEC: 5.7 mg/m³ Developmental Toxicity: NOAEC: 19.3 mg/m³ Method: OECD Test Guideline 414 GLP: no Test Type: Developmental toxicity study Species: Mouse Strain: CF1 Application Route: inhalation (aerosol) Dose: 0, 5, 20 mg/m³ Duration of Single Treatment: 9 d General Toxicity Maternal: NOAEC: 5.7 mg/m³ Developmental Toxicity: NOAEC: 19.3 mg/m³ Method: OECD Test Guideline 414 GLP: no

STOT - single exposure

Product:

Remarks	:	No data available

STOT - repeated exposure

Product:

Remarks	:	No data available

Repeated dose toxicity

Components:

Sulphuric acid:

Species	:	Rat, female
	:	0.3 mg/m³
Application Route	:	inhalation (aerosol)
Exposure time	:	28 d
Number of exposures	:	5 d/w
Dose	:	0, 0.2, 1.0, 5.0 mg/m3
Method	:	OECD Test Guideline 412
GLP	:	yes

Further information

Product:

Remarks	:	No data available

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Sulphuric acid:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): > 16 mg/l Exposure time: 96 h Test Type: static test GLP: no Remarks: Fresh water
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 GLP: yes Remarks: Fresh water
Toxicity to fish (Chronic toxicity)	:	NOEC (Jordanella floridae (flagfish)): 0.025 mg/l Exposure time: 65 days GLP: no Remarks: Fresh water

ruthenium trichloride:

Ecotoxicology Assessment

Chronic aquatic toxicity	:	Harmful to aquatic life with long lasting effects.

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

Product:

Ozone-Depletion Potential	:	Regulation: 40 CFR Protection of Environment; Part 82 Protection of Stratospheric Ozone - CAA Section 602 Class I Substances Remarks: This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
Additional ecological information	:	No data available

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues	:	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company. Dispose of as hazardous waste in compliance with local and national regulations.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3264
Proper shipping name	:	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Sulphuric acid, Ruthenium chloride)
Class	:	8
Packing group	:	II
Labels	:	8

Marine pollutant	:	no

IATA-DGR

UN/ID No.	:	UN 3264
Proper shipping name	:	Corrosive liquid, acidic, inorganic, n.o.s. (Sulphuric acid, Ruthenium chloride)
Class	:	8
Packing group	:	II
Labels	:	Corrosive

Packing instruction (cargo aircraft)	:	855
Maximum quantity	:	30.00 L
Packing instruction (passenger aircraft)	:	851
Maximum quantity	:	1.00 L

IMDG-Code

UN number	:	UN 3264
Proper shipping name	:	CORROSIVE LIQUID, ACIDIC, INORGANIC, N.O.S. (Sulphuric acid, Ruthenium chloride)
Class	:	8
Packing group	:	II
Labels	:	8

EmS Code	:	F-A, S-B
Marine pollutant	:	no
IMDG segregationcode	:	Acids

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

National Regulations

49 CFR

UN/ID/NA number	:	UN 3264
Proper shipping name	:	Corrosive liquid, acidic, inorganic, n.o.s. (Sulphuric acid, Ruthenium chloride)
Class	:	8
Packing group	:	II
Labels	:	CORROSIVE

ERG Code	:	154
Marine pollutant	:	no

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sulphuric acid	7664-93-9	1000	5000

SARA 304 Extremely Hazardous Substances Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Sulphuric acid	7664-93-9	1000	5000

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

Components	CAS-No.	Component TPQ (lbs)
Sulphuric acid	7664-93-9	1000

SARA 311/312 Hazards : Corrosive to metals
Skin corrosion or irritation
Serious eye damage or eye irritation

SARA 313 : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).
This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).
This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCMI Intermediate or Final VOC's (40 CFR 60.489).

Clean Water Act

This product does not contain any toxic pollutants listed under the U.S. Clean Water Act Section 307
The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Sulphuric acid	7664-93-9	20 %

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Sulphuric acid	7664-93-9	20 %

US State Regulations

Massachusetts Right To Know

Sulphuric acid	7664-93-9

Pennsylvania Right To Know

water	7732-18-5
Sulphuric acid	7664-93-9
ruthenium trichloride	10049-08-8

Maine Chemicals of High Concern

Product does not contain any listed chemicals

Vermont Chemicals of High Concern

Product does not contain any listed chemicals

Washington Chemicals of High Concern

Product does not contain any listed chemicals

California Prop. 65

WARNING: This product can expose you to chemicals including Sulphuric acid, which is/are known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

Sulphuric acid	7664-93-9

California Permissible Exposure Limits for Chemical Contaminants

Sulphuric acid	7664-93-9

The components of this product are reported in the following inventories:

CH INV	:	On the inventory, or in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
AICS	:	On the inventory, or in compliance with the inventory
NZIoC	:	Not in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
ISHL	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TSCA	:	On TSCA Inventory

TSCA list

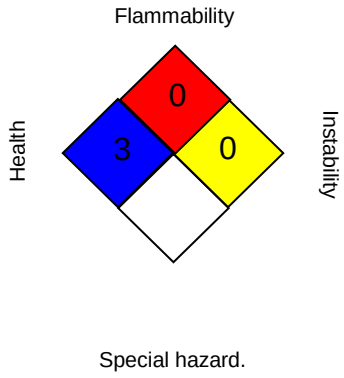
No substances are subject to a Significant New Use Rule.

No substances are subject to TSCA 12(b) export notification requirements.

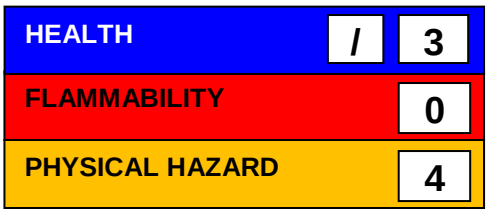
SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:



HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. The "*" represents a chronic hazard, while the "/" represents the absence of a chronic hazard.

Full text of other abbreviations

ACGIH	:	US. ACGIH Threshold Limit Values
ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
NIOSH REL	:	USA. NIOSH Recommended Exposure Limits
OSHA P0	:	USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000
OSHA Z-1	:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	:	Time weighted average
ACGIH / TWA	:	8-hour, time-weighted average
NIOSH REL / TWA	:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
OSHA P0 / TWA	:	8-hour time weighted average
OSHA Z-1 / TWA	:	8-hour time weighted average

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International

Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Revision Date : 06/29/2019

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

US / EN