

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

SECTION 1. IDENTIFICATION

Product name : RUTHUNA® 279 Black ready for use
Material number : 000000574397279911

Product code : 300000002622

Manufacturer or supplier's details

Company name of supplier : Uyemura International Corporation
Address : 240 Town Line Road
06489 Southington, CT
USA

Telephone : 860-793-4011
Telefax : +497171607316
E-mail address of person responsible for the SDS : galvano@eu.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) 0532 8388 9090

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 the OSHA Hazard Communication Standard (29 CFR 1910.1200)

Corrosive to metals : Category 1


Skin corrosion : Category 1B

Serious eye damage : Category 1

GHS label elements

RUTHUNA® 279 Black ready for use

Version 8.0 US SDS Number: 300000002622 Revision Date: 03/26/2023

- 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:
14.8 %

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Concentration (% w/w)
sulphuric acid	7664-93-9	<= 11
ruthenium trichloride	10049-08-8	<= 3.8

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

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 circumstances 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.

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

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 : Neutralize with chalk, alkali solution or ammonia.
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.
No decomposition if stored and applied as directed.

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 particulate matter)	0.2 mg/m ³	ACGIH
		TWA	1 mg/m ³	NIOSH REL

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

		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

Odour : No data available

pH : ca. 0.5
Concentration: 100 %

Melting point/freezing point : not determined

Boiling point/boiling range : not determined

Flash point : does not flash

Flammability (liquids) : Does not sustain combustion.

Vapour pressure : not determined

Density : ca. 1.09 g/cm3

Solubility(ies)
Water solubility : completely miscible

Partition coefficient: n-octanol/water : No data available

Auto-ignition temperature : not determined

Viscosity

RUTHUNA® 279 Black ready for use

Version 8.0 US SDS Number: 300000002622 Revision Date: 03/26/2023

Viscosity, kinematic : not determined
Metal corrosion rate : Corrosive to metals

SECTION 10. STABILITY AND REACTIVITY

Reactivity : Stable at normal ambient temperature and pressure.
Chemical stability : 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
 Alkali metals
 Alkaline earth metals
 Metals
Hazardous decomposition products : No decomposition if stored and applied as directed.

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, male and female): > 5,000 mg/kg
 GLP: no

Acute inhalation toxicity : LC50 (Rat, male and female): 0.375 mg/l
 Test atmosphere: dust/mist
 Method: OECD Test Guideline 403
 GLP: no

Acute dermal toxicity : Assessment: No data available
 Remarks: data waiving in REACH dossier

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

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

Skin corrosion/irritation

Product:

Result : Corrosive after 3 minutes to 1 hour of exposure

Components:

sulphuric acid:

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

ruthenium trichloride:

Result : Corrosive after 3 minutes to 1 hour of exposure

Serious eye damage/eye irritation

Components:

sulphuric acid:

Remarks : data waiving in REACH dossier
Not classified due to data which are conclusive although insufficient for classification.

ruthenium trichloride:

Result : Irreversible effects on the eye

Respiratory or skin sensitisation

Product:

Remarks : No data available

Components:

sulphuric acid:

Exposure routes : Skin contact
Remarks : data waiving in REACH dossier

Exposure routes : Inhalation
Remarks : data waiving in REACH dossier

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

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

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

Genotoxicity in vivo : Remarks: data waiving in REACH dossier

Carcinogenicity
Product:

Remarks : No data available

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 fertility : Remarks: data waiving in REACH dossier

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

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

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

Components:

sulphuric acid:

Exposure routes : Inhalation, Ingestion, Skin contact

STOT - repeated exposure

Product:

Remarks : No data available

Components:

sulphuric acid:

Exposure routes : Inhalation

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

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

Aspiration toxicity

Components:

sulphuric acid:

Not classified due to data which are conclusive although insufficient for classification.

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 algae/aquatic plants : EC50 (*Desmodesmus subspicatus* (green algae)): > 100 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
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
- Toxicity to microorganisms : NOEC (activated sludge): 26,000 mg/l
Exposure time: 37 d
Method: No data available
GLP: no
Remarks: Based on data from similar materials

ruthenium trichloride:

Ecotoxicology Assessment

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

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

Persistence and degradability

Components:

sulphuric acid:

Biodegradability : Remarks: data waiving in REACH dossier

Bioaccumulative potential

Components:

sulphuric acid:

Bioaccumulation : Remarks: Not applicable

Partition coefficient: n-octanol/water : Remarks: data waiving in REACH dossier

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 contaminated packaging as if 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.

RUTHUNA® 279 Black ready for use

Version 8.0 US SDS Number: 300000002622 Revision Date: 03/26/2023

(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 segregation code : 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

RUTHUNA® 279 Black ready for use

Version 8.0 US SDS Number: 300000002622 Revision Date: 03/26/2023



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

CERCLA Reportable Quantity

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

SARA 304 Extremely Hazardous Substances Reportable Quantity

Listed substances in the product are at low enough levels to not be expected to exceed the RQ

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 : The following components are subject to reporting levels established by SARA Title III, Section 313:

sulphuric acid 7664-93-9 11 %

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 SOCM I 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 11 %

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

sulphuric acid 7664-93-9 11 %

This product does not contain any priority pollutants related to the U.S. Clean Water Act

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

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:

TSCA	:	All substances listed as active on the TSCA inventory
AIIC	:	On the inventory, or in compliance with the inventory
DSL	:	All components of this product are on the Canadian DSL
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
NZIoC	:	Not in compliance with the inventory
CH INV	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory
TECI	:	On the inventory, or in compliance with the inventory

RUTHUNA® 279 Black ready for use

Version 8.0 US SDS Number: 300000002622 Revision Date: 03/26/2023

TSCA list

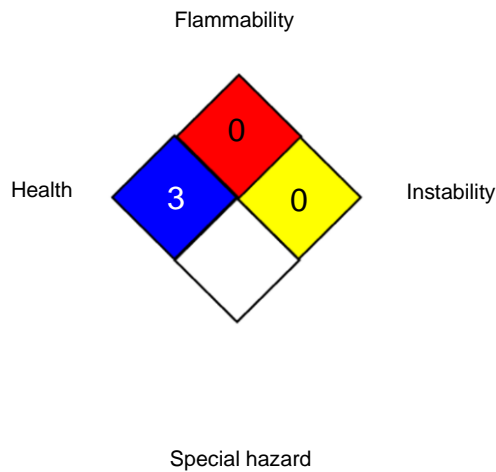
No substances are subject to a Significant New Use Rule.

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

SECTION 16. OTHER INFORMATION

Further information

NFPA 704:



HMIS® IV:

HEALTH	/	3
FLAMMABILITY		0
PHYSICAL HAZARD		4

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. Table Z-1-A Limits for Air Contaminants (1989 vacated values)
- 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

AIIC - Australian Inventory of Industrial Chemicals; 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

RUTHUNA® 279 Black ready for use

Version 8.0

US

SDS Number: 300000002622

Revision Date: 03/26/2023

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; TECI - Thailand Existing Chemicals 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 : 03/26/2023

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