

Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

SECTION 1: Identification

1.1 Product identifier

SDS Identifier V3905SS

Catalog numbers A-3905, S-3905, S-3905R

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses Components of water analysis test kits

1.3 Details of the supplier of the safety data sheet

AquaPhoenix Scientific, Inc. 860 Gitts Run Road Hanover PA 17331 United States

Telephone: (717) 632-1291

e-mail: info@aquaphoenixsci.com

Website: https://www.aquaphoenixsci.com/

e-mail (competent person) scraig@aquaphoenixsci.com (Stephen Craig)

1.4 Emergency telephone number

Emergency information service ChemTel Inc.: 1-800-255-3924, +01-813-248-0585

SECTION 2: Hazard(s) identification

2.1 Classification of the substance or mixture

Classification acc. to GHS

Hazard class	Category	Hazard class and cat- egory	Hazard state- ment
substance or mixture corrosive to metals	1	Met. Corr. 1	H290
acute toxicity (oral)	5	Acute Tox. 5	H303
acute toxicity (inhal.)	4	Acute Tox. 4	H332
skin corrosion/irritation	1	Skin Corr. 1	H314
serious eye damage/eye irritation	1	Eye Dam. 1	H318

For full text of abbreviations: see SECTION 16.

The most important adverse physicochemical, human health and environmental effects

Skin corrosion produces an irreversible damage to the skin; namely, visible necrosis through the epidermis and into the dermis.

United States: en Page: 1 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

2.2 Label elements

Labeling

- Signal word danger

- Pictograms

GHS05, GHS07



- Hazard statements

H290 May be corrosive to metals.H303 May be harmful if swallowed.

H314 Causes severe skin burns and eye damage.

H332 Harmful if inhaled.

- Precautionary statements

P234 Keep only in original packaging.
P260 Do not breathe dusts or mists.

P264+P265 Wash hands thoroughly after handling. Do not touch eyes.

P271 Use only outdoors or in a well-ventilated area.

P280 Wear eye protection/face protection.
P301+P317 IF SWALLOWED: Get medical help.

P301+P330+P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302+P361+P354 IF ON SKIN: Take off immediately all contaminated clothing. Immediately rinse with water for

several minutes.

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305+P354+P338 IF IN EYES: Immediately rinse with water for several minutes. Remove contact lenses, if present

and easy to do. Continue rinsing.

P316 Get emergency medical help immediately.
P321 Specific treatment (see on this label).
P363 Wash contaminated clothing before reuse.
P390 Absorb spillage to prevent material damage.

P405 Store locked up.

P406 Store in a corrosion resistant container with a resistant inner liner.
P501 Dispose of contents/container to industrial combustion plant.

- Hazardous ingredients for labelling nitric acid, ferric nitrate, 1,10-phenanthroline

monohydrate

United States: en Page: 2 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

2.3 Other hazards

Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance in a concentration of \geq 0.1%.

Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) in a concentration of \geq 0.1%.

SECTION 3: Composition/information on ingredients

3.1 Substances

Not relevant (mixture)

3.2 Mixtures

Description of the mixture

Name of substance	Identifier	Wt%	Classification acc. to GHS	Pictograms
deionized water	CAS No 7732-18-5	76		
nitric acid	CAS No 7697-37-2	16	Ox. Liq. 3 / H272 Met. Corr. 1 / H290 Acute Tox. 3 / H331 Skin Corr. 1A / H314 Eye Dam. 1 / H318	
1,10-phenanthroline mono- hydrate	CAS No 5144-89-8	5	Acute Tox. 3 / H301	
ferric nitrate	CAS No 7782-61-8 10421-48-4	3	Acute Tox. 5 / H303 Acute Tox. 5 / H313 Skin Corr. 1B / H314 Eye Dam. 1 / H318 Aquatic Acute 3 / H402	

For full text of abbreviations: see SECTION 16.

SECTION 4: First-aid measures

4.1 Description of first-aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation

If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician. Provide fresh air.

United States: en Page: 3 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

Following skin contact

Wash with plenty of soap and water.

Following eye contact

Remove contact lenses, if present and easy to do. Continue rinsing. Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart.

Following ingestion

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms and effects are not known to date.

4.3 Indication of any immediate medical attention and special treatment needed

none

SECTION 5: Fire-fighting measures

5.1 Extinguishing media

Suitable extinguishing media

Water spray, Alcohol resistant foam, BC-powder, Carbon dioxide (CO2)

Unsuitable extinguishing media

Water jet

5.2 Special hazards arising from the substance or mixture

Substance or mixture corrosive to metals.

Hazardous combustion products

Nitrogen oxides (NOx), Carbon monoxide (CO), Carbon dioxide (CO2)

5.3 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Coordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately. Fight fire with normal precautions from a reasonable distance.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety.

For emergency responders

Wear breathing apparatus if exposed to vapors/dust/aerosols/gases.

United States: en Page: 4 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advice on how to contain a spill

Covering of drains

Advice on how to clean up a spill

Wipe up with absorbent material (e.g. cloth, fleece). Collect spillage: sawdust, kieselgur (diatomite), sand, universal binder

Appropriate containment techniques

Use of adsorbent materials.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations

Wear impact- and splash-resistant eyewear.

- Measures to prevent fire as well as aerosol and dust generation

Use local and general ventilation. Use only in well-ventilated areas.

- Handling of incompatible substances or mixtures
- Keep away from

Caustic solutions

Advice on general occupational hygiene

Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs.

7.2 Conditions for safe storage, including any incompatibilities

Managing of associated risks

- Corrosive conditions

Store in corrosive resistant container with a resistant inner liner.

United States: en Page: 5 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

Control of the effects

Protect against external exposure, such as

heat, high temperatures, light, UV-radiation/sunlight

- Ventilation requirements

Keep any substance that emits harmful vapors or gases in a place that allows these to be permanently extracted.

- Packaging compatibilities

Only packagings which are approved (e.g. acc. to the Dangerous Goods Regulations) may be used.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)

Coun- try	Name of agent	CAS No	Identi- fier		TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Ceiling-C [mg/m³]	Source
US	nitric acid	7697-37-2	PEL (CA)	2	5	4	10		Cal/ OSHA PEL
US	nitric acid	7697-37-2	REL	2 (10 h)	5 (10 h)	4	10		NIOSH REL
US	nitric acid	7697-37-2	TLV®	2		4			ACGIH® 2023
US	nitric acid	7697-37-2	PEL	2	5				29 CFR 1910.100 0

Notation

Ceiling-C ceiling value is a limit value above which exposure should not occur

STEL short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period

(unless otherwise specified)

TWA time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-

weighted average (unless otherwise specified

Relevant DNELs of components

Name of substance	CAS No	Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
ferric nitrate	7782-61-8 10421-48-4	DNEL	12 mg/m³	human, inhalatory	worker (industry)	chronic - systemic ef- fects
ferric nitrate	7782-61-8 10421-48-4	DNEL	17 mg/kg bw/ day	human, dermal	worker (industry)	chronic - systemic ef- fects

United States: en Page: 6 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

Relevant PNECs of components

Name of substance	CAS No	Endpoint	Threshold level	Organism	Environmental compartment	Exposure time
ferric nitrate	7782-61-8 10421-48-4	PNEC	0.024 ^{mg} / _l	aquatic organisms	freshwater	short-term (single in- stance)
ferric nitrate	7782-61-8 10421-48-4	PNEC	0.002 ^{mg} / _l	aquatic organisms	marine water	short-term (single in- stance)
ferric nitrate	7782-61-8 10421-48-4	PNEC	500 ^{mg} / _l	aquatic organisms	sewage treatment plant (STP)	short-term (single in- stance)
ferric nitrate	7782-61-8 10421-48-4	PNEC	0.2 ^{mg} / _{kg}	aquatic organisms	freshwater sediment	short-term (single in- stance)
ferric nitrate	7782-61-8 10421-48-4	PNEC	0.02 ^{mg} / _{kg}	aquatic organisms	marine sediment	short-term (single in- stance)
ferric nitrate	7782-61-8 10421-48-4	PNEC	0.026 ^{mg} / _{kg}	terrestrial organ- isms	soil	short-term (single in- stance)

8.2 Exposure controls

Appropriate engineering controls

General ventilation.

Individual protection measures (personal protective equipment)

Eye/face protection

Wear eye/face protection.

Skin protection

- Hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. In the case of wanting to use the gloves again, clean them before taking off and air them well. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- Other protection measures

Wash hands thoroughly after handling.

Respiratory protection

In case of inadequate ventilation wear respiratory protection.

Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

United States: en Page: 7 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Product description: Activator Solution: Plastic bottle, contains approximately 9 mL of liquid reagent. Test kits contain one (1) bottle of solution

Physical state	liquid
Color	Gold to orange
Odor	odorless
Melting point/freezing point	-12 °C
Boiling point or initial boiling point and boiling range	>100 °C
Evaporation rate	not determined
Flammability	non-combustible
Lower and upper explosion limit	not determined
Flash point	not determined
Auto-ignition temperature	not determined
Decomposition temperature	not relevant
pH (value)	<2 (acid)
Kinematic viscosity	not determined

Solubility(ies)

Water solubility	miscible in any proportion
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Partition coefficient

Partition coefficient n-octanol/water (log value)	this information is not available
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Vapor pressure	23.7 mmHg at 25 °C

United States: en Page: 8 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

Density and/or relative density

Density	not determined
Relative vapour density	information on this property is not available
Relative density	1.08 (water = 1)

Particle characteristics	not relevant (liquid)
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SECTION 10: Stability and reactivity

10.1 Reactivity

Concerning incompatibility: see below "Conditions to avoid" and "Incompatible materials". Substance or mixture corrosive to metals.

10.2 Chemical stability

See below "Conditions to avoid".

10.3 Possibility of hazardous reactions

No known hazardous reactions.

10.4 Conditions to avoid

There are no specific conditions known which have to be avoided.

10.5 Incompatible materials

Oxidizers

10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Test data are not available for the complete mixture.

Classification procedure

The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

United States: en Page: 9 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200)

Acute toxicity

May be harmful if swallowed. Harmful if inhaled.

- Acute toxicity estimate (ATE)

Oral $2,539 \frac{\text{mg}}{\text{kg}}$ Inhalation: vapor $16.56 \frac{\text{mg}}{\text{l}}/\text{l}/4\text{h}$

Acute toxicity estimate (ATE) of components

Name of substance	CAS No	Exposure route	ATE
nitric acid	7697-37-2	inhalation: vapor	>2.65 ^{mg} / _l /4h
1,10-phenanthroline monohydrate	5144-89-8	oral	132 ^{mg} / _{kg}
ferric nitrate	7782-61-8 10421-48-4	oral	>2,000 ^{mg} / _{kg}
ferric nitrate	7782-61-8 10421-48-4	dermal	>2,000 ^{mg} / _{kg}

Skin corrosion/irritation

Causes severe skin burns and eye damage.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitization

Shall not be classified as a respiratory or skin sensitizer.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

Shall not be classified as a specific target organ toxicant (single exposure).

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

United States: en Page: 10 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

11.2 Information on other hazards

There is no additional information.

SECTION 12: Ecological information

12.1 Toxicity

Shall not be classified as hazardous to the aquatic environment.

12.2 Persistence and degradability

Data are not available.

12.3 Bioaccumulative potential

Data are not available.

12.4 Mobility in soil

Data are not available.

12.5 Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB. Does not contain a PBT-/vPvB-substance in a concentration of $\geq 0.1\%$.

12.6 Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) in a concentration of \geq 0.1%.

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Please consider the relevant national or regional provisions.

SECTION 14: Transport information

14.1 UN number

DOT UN 1760 IMDG-Code UN 1760 ICAO-TI UN 1760

14.2 UN proper shipping name

DOT Corrosive liquid, n.o.s.

United States: en Page: 11 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

IMDG-Code CORROSIVE LIQUID, N.O.S. ICAO-TI Corrosive liquid, n.o.s. nitric acid, 1,10-phenanthroline monohydrate Technical name (hazardous ingredients) 14.3 Transport hazard class(es) DOT 8 IMDG-Code 8 ICAO-TI 8 Packing group 14.4 DOT II IMDG-Code II ICAO-TI ΙΙ 14.5 **Environmental hazards** non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Other relevant information

Shipping container markings and labels, received from CHEMetrics, may vary from the above information. Products that are regulated for transport will be packaged by CHEMetrics as Dangerous Goods in Excepted Quantities according to IATA, US DOT, and IMDG regulations. CHEMetrics may also elect to ship certain products as UN 3316 Chemical Kit, Hazard Class 9, Packing Group II or III. In case of reshipment, it is the responsibility of the shipper to determine appropriate labels and markings in accordance with applicable transportation regulations.

14.7 Maritime transport in bulk according to IMO instruments

The cargo is not intended to be carried in bulk.

Information for each of the UN Model Regulations

Transport of dangerous goods by road or rail (49 CFR US DOT) - Additional information

Particulars in the shipper's declaration UN1760, Corrosive liquid, n.o.s., (contains: nitric

acid, 1,10-phenanthroline monohydrate), 8, II

Reportable quantity (RQ) 6,250 lbs (2,838 kg) (nitric acid) (ferric nitrate)

Danger label(s) 8



Special provisions (SP) B2, IB2, T11, TP2, TP27

United States: en Page: 12 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

ERG No 154

International Maritime Dangerous Goods Code (IMDG) - Additional information

Marine pollutant -

Danger label(s) 8



Special provisions (SP) 274

Excepted quantities (EQ) E2

Limited quantities (LQ) 1 L

EmS F-A, S-B

Stowage category B

International Civil Aviation Organization (ICAO-IATA/DGR) - Additional information

Danger label(s) 8



Special provisions (SP) A3

Excepted quantities (EQ) E2

Limited quantities (LQ) 0,5 L

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

National regulations (United States)

Toxic Substance Control Act (TSCA) not all ingredients are listed (ACTIVE)

Superfund Amendment and Reauthorization Act (SARA TITLE III)

- The List of Extremely Hazardous Substances and Their Threshold Planning Quantities (EPCRA Section 302, 304)

United States: en Page: 13 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

The List of Extremely Hazardous Substances and Their Threshold Planning Quantities

Name of substance	Notes	Reportable quantity (pounds)	Threshold planning quantity (pounds)
nitric acid		1,000	1000

- Specific Toxic Chemical Listings (EPCRA Section 313)

Toxics Release Inventory: Specific Toxic Chemical Listings

Name of substance	Remarks	Effective date
nitric acid		1986-12-31
ferric nitrate	water dissociable; reportable only when in aqueous solution	1994-12-31

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

- List of Hazardous Substances and Reportable Quantities (CERCLA section 102a) (40 CFR 302.4)

Name of substance	Remarks	Statutory code	Final RQ pounds (Kg)
nitric acid		1	1000 (454)
ferric nitrate		1	1000 (454)

Legend

Clean Air Act

Name of substance	Type of registration	Basis for listing	Threshold quantity (lbs)
nitric acid	Toxic substance	b	15000

Legend

Right to Know Hazardous Substance List

- Hazardous Substance List (NJ-RTK)

Name of substance	Remarks	Classifications
nitric acid		CO R2
ferric nitrate		

United States: en Page: 14 / 18

[&]quot;1" indicates that the statutory source is section 311(b)(2) of the Clean Water Act

b On EHS list, vapor pressure 10 mmHg or greater.



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

Legend

CO Corrosive

R2 Reactive - Second Degree

California Environmental Protection Agency (Cal/EPA): Proposition 65 - Safe Drinking Water and Toxic Enforcement Act of 1987

none of the ingredients are listed

National inventories

Country	Inventory	Status
AU	AIIC	all ingredients are listed
CA	DSL	not all ingredients are listed
CN	IECSC	all ingredients are listed
EU	ECSI	not all ingredients are listed
EU	REACH Reg.	not all ingredients are listed
JP	CSCL-ENCS	all ingredients are listed
JP	ISHA-ENCS	not all ingredients are listed
KR	KECI	not all ingredients are listed
MX	INSQ	all ingredients are listed
NZ	NZIoC	all ingredients are listed
PH	PICCS	all ingredients are listed
TR	CICR	not all ingredients are listed
TW	TCSI	all ingredients are listed
VN	NCI	all ingredients are listed
US	TSCA	not all ingredients are listed

Legend

AIIC Australian Inventory of Industrial Chemicals
CICR Chemical Inventory and Control Regulation

CSCL-ENCS List of Existing and New Chemical Substances (CSCL-ENCS)

DSL Domestic Substances List (DSL)

ECSI EC Substance Inventory (EINECS, ELINCS, NLP)

IECSC Inventory of Existing Chemical Substances Produced or Imported in China

INSQ National Inventory of Chemical Substances

ISHA-ENCS Inventory of Existing and New Chemical Substances (ISHA-ENCS)

KECI Korea Existing Chemicals Inventory
NCI National Chemical Inventory
NZIOC New Zealand Inventory of Chemicals

PICCS Philippine Inventory of Chemicals and Chemical Substances (PICCS)

REACH Reg. REACH registered substances

TCSI Taiwan Chemical Substance Inventory

United States: en Page: 15 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

Legend

TSCA Toxic Substance Control Act

15.2 Chemical Safety Assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information, including date of preparation or last revision

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
29 CFR 1910.1000	29 CFR 1910.1000, Tables Z-1, Z-2, Z-3 - Occupational Safety and Health Standards: Toxic and Hazardous Substances (permissible exposure limits)
49 CFR US DOT	49 CFR U.S. Department of Transportation
ACGIH® 2023	From ACGIH®, 2023 TLVs® and BEIs® Book. Copyright 2023. Reprinted with permission. Information on the proper use of the TLVs® and BEIs®: http://www.acgih.org/tlv-bei-guidelines/policies-procedures-presentations/tlv-bei-position-statement
Acute Tox.	Acute toxicity
Aquatic Acute	Hazardous to the aquatic environment - acute hazard
ATE	Acute Toxicity Estimate
Cal/OSHA PEL	California Division of Occupational Safety and Health (Cal/OSHA): Permissible Exposure Limits (PELs)
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
Ceiling-C	Ceiling value
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
DOT	Department of Transportation (USA)
ED	Endocrine disruptor
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
ERG No	Emergency Response Guidebook - Number
Eye Dam.	Seriously damaging to the eye
Eye Irrit.	Irritant to the eye
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)

United States: en Page: 16 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

Abbr.	Descriptions of used abbreviations
ICAO	International Civil Aviation Organization
ICAO-TI	Technical instructions for the safe transport of dangerous goods by air
IMDG	International Maritime Dangerous Goods Code
IMDG-Code	International Maritime Dangerous Goods Code
Met. Corr.	Substance or mixture corrosive to metals
NIOSH REL	National Institute for Occupational Safety and Health (NIOSH): Recommended Exposure Limits (RELs)
NLP	No-Longer Polymer
OSHA	Occupational Safety and Health Administration (United States)
Ox. Liq.	Oxidizing liquid
PBT	Persistent, Bioaccumulative and Toxic
PEL	Permissible exposure limit
PNEC	Predicted No-Effect Concentration
ppm	Parts per million
RTECS	Registry of Toxic Effects of Chemical Substances (database of NIOSH with toxicological information)
Skin Corr.	Corrosive to skin
Skin Irrit.	Irritant to skin
STEL	Short-term exposure limit
TLV®	Threshold Limit Values
TWA	Time-weighted average
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

Globally Harmonized System of Classification and Labelling of Chemicals ("Purple book").

Transport of dangerous goods by road or rail (49 CFR US DOT). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

Classification procedure

Physical and chemical properties: The classification is based on tested mixture. Health hazards, Environmental hazards: The method for classification of the mixture is based on ingredients of the mixture (additivity formula).

United States: en Page: 17 / 18



Version number: 12.0 Revision: 2023-11-08 SDS Identifier: V3905SS

List of relevant phrases (code and full text as stated in section 2 and 3)

Code	Text
H272	May intensify fire; oxidizer.
H290	May be corrosive to metals.
H301	Toxic if swallowed.
H303	May be harmful if swallowed.
H313	May be harmful in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H402	Harmful to aquatic life.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

United States: en Page: 18 / 18