SAFETY DATA SHEET

RUGBY® 200 CS

Version	Revision Date:	SDS Number:	Date of last issue: -
3.0	15.05.2025	50000162	Date of first issue: 14.12.2017

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : RUGBY® 200 CS

Manufacturer or supplier's details

Company : FMC QUÍMICA DO BRASIL LTDA.

Address : AVENIDA DR. JOSÉ BONIFÁCIO COUTINHO NOGUEIRA 150 - 1º ANDAR - JARDIM MADALENA, CAMPINAS SP BRASIL
TELEFONE: (19) 2042.4500

Emergency telephone : Brazil: 0800 34 35 450 (24 hours)
+55-2139581449 (CHEMTREC)

Medical Emergency Number : 0800 7010 450

Recommended use of the chemical and restrictions on use

Recommended use : Insecticide

Restrictions on use : Use as recommended by the label.

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification in accordance with ABNT NBR 14725 Standard

Acute toxicity (Oral) : Category 4

Acute toxicity (Inhalation) : Category 4

Acute toxicity (Dermal) : Category 5

Specific target organ toxicity - single exposure : Category 1 (Nervous system)

Specific target organ toxicity - repeated exposure : Category 1 (Nervous system)

Specific target organ toxicity - repeated exposure : Category 2 (Skin)

Short-term (acute) aquatic hazard : Category 1

Long-term (chronic) aquatic hazard : Category 1

GHS label elements in accordance with ABNT NBR 14725 Standard

Hazard pictograms :

Signal Word : DANGER

Hazard Statements : H302 + H332 Harmful if swallowed or if inhaled.
H313 May be harmful in contact with skin.
H370 Causes damage to organs (Nervous system).
H372 Causes damage to organs (Nervous system) through prolonged or repeated exposure.
H373 May cause damage to organs (Skin) through prolonged or repeated exposure.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary Statements :

Prevention:

P260 Do not breathe mist or vapors.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P273 Avoid release to the environment.

Response:

P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell. Rinse mouth.
P302 + P312 IF ON SKIN: Call a POISON CENTER/ doctor if you feel unwell.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P308 + P311 IF exposed or concerned: Call a POISON CENTER/ doctor.
P391 Collect spillage.

Storage:

P405 Store locked up.

Disposal:

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

Other hazards which do not result in classification

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	CAS-No.	Classification	Concentration (% w/w)
Cadusafos	95465-99-9	Acute Tox. (Oral), 2	>= 10 -< 20

		Acute Tox. (Inhalation), 1 Acute Tox. (Dermal), 1 STOT SE, (Nervous system) , 1 STOT RE, (Nervous system) , 1 Aquatic Acute, 1 Aquatic Chronic, 1	
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5	STOT RE, (Skin) , 1 Asp. Tox., 1 Aquatic Acute, 2	>= 5 -< 10
hexamethylenediamine	124-09-4	Acute Tox. (Oral), 4 Acute Tox. (Dermal), 4 Skin corrosion/irritation, 1B Serious eye damage/eye irritation, 1 STOT SE, (Respiratory system) , 3 Aquatic Acute, 3	>= 2,5 -< 3
phosphoric acid	7664-38-2	Met. Corr., 1 Acute Tox. (Oral), 5 Skin corrosion/irritation, 1A Serious eye damage/eye irritation, 1 Aquatic Acute, 2 Aquatic Chronic, 2	>= 1 -< 2,5
2-ethylhexanoic acid, copper salt	22221-10-9	Acute Tox. (Oral), 5 Acute Tox. (Dermal), 4 Serious eye damage/eye irritation, 1 Repr., 2 Aquatic Acute, 3 Aquatic Chronic, 1	>= 0,1 -< 0,25
Naphthenic acids, copper salts	1338-02-9	Acute Tox. (Oral), 3 Acute Tox. (Dermal), 5 Aquatic Acute, 1 Aquatic Chronic, 1	>= 0,1 -< 0,25

SECTION 4. FIRST AID MEASURES

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

If inhaled	:	If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
In case of skin contact	:	Wash off with soap and water. If symptoms persist, call a physician. Wash contaminated clothing before re-use.
In case of eye contact	:	Flush eyes with water as a precaution. Remove contact lenses. Protect unharmed eye. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	:	Do not induce vomiting without medical advice. Keep respiratory tract clear. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician. Take victim immediately to hospital.
Most important symptoms and effects, both acute and delayed	:	Harmful if swallowed or if inhaled. May be harmful in contact with skin. Causes damage to organs. Causes damage to organs through prolonged or repeated exposure. Contains a cholinesterase inhibitor. Symptoms may include nausea, diarrhea, vomiting, decreased appetite, indigestion, muscle cramps, fatigue, insomnia, dizziness, headache, and lack of energy.
Protection of first-aiders	:	Avoid inhalation, ingestion and contact with skin and eyes.
Notes to physician	:	Treat symptomatically.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Dry chemical, CO2, water spray or regular foam.
Unsuitable extinguishing media	:	Do not spread spilled material with high-pressure water streams.
Specific hazards during fire fighting	:	Do not allow run-off from fire fighting to enter drains or water courses.
Hazardous combustion products	:	Fire may produce irritating, corrosive and/or toxic gases. phosphorus oxides Carbon oxides Sulfur oxides Ammonia
Specific extinguishing methods	:	Remove undamaged containers from fire area if it is safe to do so. Use a water spray to cool fully closed containers.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
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 fire-fighters : Firefighters should wear protective clothing and self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Evacuate personnel to safe areas.
Do not touch or walk through the spilled material.
If it can be safely done, stop the leak.
Use personal protective equipment.

Environmental precautions : Prevent further leakage or spillage if safe to do so.
Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Never return spills in original containers for re-use.
Collect as much of the spill as possible with a suitable absorbent material.
Pick up and transfer to properly labeled containers.
Keep in suitable, closed containers for disposal.

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 vapors/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
Dispose of rinse water in accordance with local and national regulations.

Hygiene measures : Avoid contact with skin, eyes and clothing.
Do not inhale aerosol.
Provide adequate ventilation.
When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

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.
Observe label precautions.
Electrical installations / working materials must comply with the technological safety standards.

Further information on storage stability : No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Cadusafos	95465-99-9	TWA (Inhalable fraction and vapor)	0,001 mg/m3	ACGIH
Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified	64742-94-5	TWA	200 mg/m3 (total hydrocarbon vapor)	ACGIH
hexamethylenediamine	124-09-4	TWA	0,5 ppm	ACGIH
phosphoric acid	7664-38-2	TWA STEL	1 mg/m3 3 mg/m3	ACGIH ACGIH

Personal protective equipment

Respiratory protection : In the case of dust or aerosol formation use respirator with an approved filter.

Hand protection
Material : Wear chemical resistant gloves, such as barrier laminate, butyl rubber or nitrile rubber.

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection : Eye wash bottle with pure water
Tightly fitting safety goggles

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Protective measures : Plan first aid action before beginning work with this product.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state : liquid

Form : viscous liquid

Color	:	light green
Odor	:	characteristic
Odor Threshold	:	No data available
pH	:	8,4 Concentration: 10 g/l
Melting point/ range	:	No data available
Boiling point/boiling range	:	72 °C
Flash point	:	No flash up to boiling point.
Evaporation rate	:	No data available
Flammability (solid, gas)	:	Not applicable
Self-ignition	:	No data available
Upper explosion limit / Upper flammability limit	:	No data available
Lower explosion limit / Lower flammability limit	:	No data available
Vapor pressure	:	No data available
Relative vapor density	:	No data available
Relative density	:	1,05 - 1,07 (20 °C)
Density	:	1,0633 g/cm3 (20 °C) Method: OECD Test Guideline 109
Solubility(ies)		
Water solubility	:	Miscible
Solubility in other solvents	:	Solvent: Toluene
		Solvent: Methanol
Partition coefficient: n-octanol/water	:	Not applicable
Autoignition temperature	:	No data available
Decomposition temperature	:	No data available
Viscosity		

Viscosity, dynamic	:	239,34 mPa.s (20 °C) Method: OECD Test Guideline 114
Viscosity, kinematic	:	No data available
Explosive properties	:	Not explosive
Oxidizing properties	:	Non-oxidizing
Surface tension	:	71,97 mN/m, 25 °C, OECD Test Guideline 115
Molecular weight	:	Not applicable
Metal corrosion rate	:	Not corrosive to metals.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No decomposition if stored and applied as directed.
Chemical stability	:	No decomposition if stored and applied as directed.
Possibility of hazardous reactions	:	No decomposition if stored and applied as directed.
Conditions to avoid	:	Avoid extreme temperatures. Avoid formation of aerosol.
Incompatible materials	:	Avoid strong acids, bases, and oxidizers.
Hazardous decomposition products	:	No hazardous decomposition products are known.

SECTION 11. TOXICOLOGICAL INFORMATION

Acute toxicity

Harmful if swallowed or if inhaled.
May be harmful in contact with skin.

Product:

Acute oral toxicity	:	LD50 (Rat, female): 300 - 2.000 mg/kg Method: OECD Test Guideline 423 Symptoms: Fatality, Tremors, prostration Assessment: The component/mixture is moderately toxic after single ingestion.
Acute inhalation toxicity	:	LC50 (Rat, male and female): > 1,746 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 Symptoms: kyphosis, Breathing difficulties

Remarks: Highest attainable concentration.

Acute dermal toxicity : LD50 (Rat, male and female): > 4.000 mg/kg
Method: OECD Test Guideline 402
Symptoms: Tremors
Remarks: no mortality

Components:

Cadusafos:

Acute oral toxicity : LD50 (Rat, female): 34 - 51 mg/kg
Method: US EPA Test Guideline OPP 81-1
Symptoms: Diarrhea, hemorrhage

LD50 (Mouse): 71,4 mg/kg

Acute inhalation toxicity : LC50 (Rat, male and female): 0,026 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: US EPA Test Guideline OPP 81-3
Symptoms: Breathing difficulties, Tremors

Acute dermal toxicity : LD50 (Rabbit, male): 7 - 17 mg/kg
Method: US EPA Test Guideline OPP 81-2

LD50 (Rabbit, female): 5 - 16 mg/kg
Method: US EPA Test Guideline OPP 81-2

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Acute oral toxicity : LD50 (Rat, male and female): > 5.000 mg/kg
Method: OECD Test Guideline 401
Remarks: Based on data from similar materials

Acute inhalation toxicity : LC50 (Rat): > 4,688 mg/l
Exposure time: 4 h
Test atmosphere: vapor
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): > 2.000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

hexamethylenediamine:

Acute oral toxicity : LD50 (Rat): 1.160 mg/kg

Acute dermal toxicity : LD50 (Rat): 1.900 mg/kg
Method: Regulation (EC) No. 440/2008, Annex, B.3

phosphoric acid:

Acute oral toxicity : LD50 (Rat, female): 2.600 mg/kg

Method: OECD Test Guideline 423

2-ethylhexanoic acid, copper salt:

Acute oral toxicity : LD50 Oral (Rat, female): 2.043 mg/kg
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat, male and female): 2.000 mg/kg
Method: OECD Test Guideline 402

Naphthenic acids, copper salts:

Acute oral toxicity : LD50 (Rat, male and female): 300 - 500 mg/kg
Method: OECD Test Guideline 423
Remarks: Based on data from similar materials

Acute dermal toxicity : LD50 (Rabbit, male and female): 3.160 mg/kg
Method: OECD Test Guideline 402
Symptoms: Lethargy, Diarrhea, anorexia
Remarks: Based on data from similar materials

Skin corrosion/irritation

Based on available data, the classification criteria are not met.

Product:

Species : Rabbit
Assessment : Not classified as irritant
Method : OECD Test Guideline 404
Result : slight irritation

Components:

Cadusafos:

Species : Rabbit
Result : No skin irritation

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Species : Rabbit
Assessment : Repeated exposure may cause skin dryness or cracking.
Result : No skin irritation
Remarks : Minimal effects that do not meet the threshold for classification.
Based on data from similar materials

hexamethylenediamine:

Species : Rabbit
Result : Corrosive after 3 minutes to 1 hour of exposure

Species : in vitro membrane barrier
Result : Corrosive after 3 minutes to 1 hour of exposure

phosphoric acid:

Species : Rabbit
Assessment : Corrosive
Result : Corrosive after 3 minutes to 1 hour of exposure

2-ethylhexanoic acid, copper salt:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Naphthenic acids, copper salts:

Species : Rabbit
Method : OECD Test Guideline 404
Result : No skin irritation

Serious eye damage/eye irritation

Based on available data, the classification criteria are not met.

Product:

Species : Rabbit
Result : slight irritation
Assessment : Not classified as irritant
Method : OECD Test Guideline 405

Components:

Cadusafos:

Species : Rabbit
Result : No eye irritation
Method : Draize Test

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Species : Rabbit
Assessment : No eye irritation
Remarks : Minimal effects that do not meet the threshold for classification.
Based on data from similar materials

hexamethylenediamine:

Species : Rabbit
Result : Irreversible effects on the eye

phosphoric acid:

Result : Irreversible effects on the eye
Remarks : Based on skin corrosivity

2-ethylhexanoic acid, copper salt:

Species : Bovine cornea
Result : Irreversible effects on the eye
Method : OECD Test Guideline 437

Naphthenic acids, copper salts:

Result	:	No eye irritation
Method	:	in vitro eye irritation test

Respiratory or skin sensitization

Skin sensitization

Based on available data, the classification criteria are not met.

Respiratory sensitization

Based on available data, the classification criteria are not met.

Product:

Test Type	:	Buehler Test
Routes of exposure	:	Dermal
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Not a skin sensitizer.

Components:

Cadusafos:

Routes of exposure	:	Skin contact
Species	:	Guinea pig
Result	:	Not a skin sensitizer.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Test Type	:	Maximization Test
Species	:	Guinea pig
Result	:	Not a skin sensitizer.
Remarks	:	Based on data from similar materials

2-ethylhexanoic acid, copper salt:

Test Type	:	Open epicutaneous test
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitization.

Naphthenic acids, copper salts:

Test Type	:	Maximization Test
Species	:	Guinea pig
Result	:	Causes sensitization.
Remarks	:	Based on data from similar materials

Germ cell mutagenicity

Based on available data, the classification criteria are not met.

Product:

Genotoxicity in vitro	:	Test Type: Ames test Method: OECD Test Guideline 471

Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test
Species: Mouse
Method: OECD Test Guideline 474
Result: negative

Components:

Cadusafos:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Result: negative

Test Type: Ames test
Metabolic activation: with and without metabolic activation
Result: negative

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Genotoxicity in vitro : Test Type: reverse mutation assay
Method: OECD Test Guideline 471
Result: negative
Remarks: Based on data from similar materials

Genotoxicity in vivo : Test Type: Bone marrow chromosome aberration.
Species: Rat
Application Route: inhalation (vapor)
Result: negative

hexamethylenediamine:

Genotoxicity in vitro : Test Type: Ames test
Result: negative

Test Type: unscheduled DNA synthesis assay
Result: negative

Test Type: Chromosome aberration test in vitro
Result: negative

Genotoxicity in vivo : Test Type: Micronucleus test
Application Route: inhalation (dust/mist/fume)
Result: negative
Remarks: Based on data from similar materials

phosphoric acid:

Genotoxicity in vitro : Test Type: reverse mutation assay
Method: OECD Test Guideline 471
Result: negative

Test Type: Chromosome aberration test in vitro
Method: OECD Test Guideline 473

Result: negative

2-ethylhexanoic acid, copper salt:

Genotoxicity in vitro	:	Test Type: reverse mutation assay Method: Mutagenicity (Escherichia coli - reverse mutation assay) Result: negative GLP: yes
Genotoxicity in vivo	:	Test Type: Micronucleus test Species: Mouse Application Route: Oral Method: Mutagenicity (micronucleus test) Result: negative

Naphthenic acids, copper salts:

Genotoxicity in vitro	:	Test Type: reverse mutation assay Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
Genotoxicity in vivo	:	Test Type: Micronucleus test Species: Mouse (male and female) Application Route: Ingestion Exposure time: 48 h Method: Mutagenicity (micronucleus test) Result: negative Remarks: Based on data from similar materials

Carcinogenicity

Based on available data, the classification criteria are not met.

Components:

Cadusafos:

Carcinogenicity - Assessment	:	Animal testing did not show any carcinogenic effects.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Species	:	Rat, male and female
Application Route	:	inhalation (vapor)
Exposure time	:	12 month(s)
NOAEC	:	1,8 mg/l
Result	:	negative
Remarks	:	Based on data from similar materials
Carcinogenicity - Assessment	:	Not classifiable as a human carcinogen.

Reproductive toxicity

Based on available data, the classification criteria are not met.

Components:

Cadusafos:

Reproductive toxicity - Assessment	:	Animal testing showed no reproductive toxicity. Animal testing showed no developmental toxicity.

hexamethylenediamine:

Effects on fertility	:	Test Type: Two-generation study Species: Rat Application Route: Oral General Toxicity Parent: NOAEL: 500 mg/kg body weight Fertility: NOAEL: 500 mg/kg body weight Early Embryonic Development: NOAEL: 500 mg/kg body weight Symptoms: Reduced body weight
Effects on fetal development	:	Species: Rat Developmental Toxicity: NOAEL: 300 mg/kg body weight Method: OECD Test Guideline 414 Result: Embryotoxic effects and adverse effects on the offspring were detected only at high maternally toxic doses

phosphoric acid:

Effects on fertility	:	Test Type: reproductive and developmental toxicity study Species: Rat, male and female Application Route: Ingestion General Toxicity Parent: NOAEL: 500 mg/kg body weight General Toxicity F1: NOAEL: 500 mg/kg body weight Method: OECD Test Guideline 422 Result: negative
Effects on fetal development	:	Test Type: Embryo-fetal development Species: Mouse Application Route: Ingestion General Toxicity Maternal: NOAEL: 370 mg/kg body weight Developmental Toxicity: NOAEL: 370 mg/kg body weight Result: negative Remarks: Based on data from similar materials

2-ethylhexanoic acid, copper salt:

Effects on fertility	:	Test Type: reproductive and developmental toxicity study Species: Rat Application Route: Oral
Effects on fetal development	:	Test Type: reproductive and developmental toxicity study Species: Rabbit Application Route: Oral
Reproductive toxicity - Assessment	:	Some evidence of adverse effects on sexual function and fertility, and/or on development, based on animal experiments.

Naphthenic acids, copper salts:

Effects on fertility	:	Species: Rat, male and female Application Route: Ingestion Method: OECD Test Guideline 416 Result: negative Remarks: Based on data from similar materials Species: Rat, male and female Application Route: Ingestion General Toxicity F1: NOAEL: 100 mg/kg body weight Remarks: Based on data from similar materials
Effects on fetal development	:	Species: Rabbit Application Route: Ingestion General Toxicity Maternal: NOAEL: 7,5 mg/kg body weight Developmental Toxicity: NOAEL: 15 mg/kg body weight Target Organs: Stomach, Kidney Method: OECD Test Guideline 414 Result: positive Remarks: Based on data from similar materials

STOT-single exposure

Causes damage to organs (Nervous system).

Components:

Cadusafos:

Target Organs	:	Nervous system
Assessment	:	The substance or mixture is classified as specific target organ toxicant, single exposure, category 1.

hexamethylenediamine:

Assessment	:	May cause respiratory irritation.

STOT-repeated exposure

Causes damage to organs (Nervous system) through prolonged or repeated exposure.
May cause damage to organs (Skin) through prolonged or repeated exposure.

Components:

Cadusafos:

Target Organs	:	Nervous system
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Target Organs	:	Skin
Assessment	:	The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Repeated dose toxicity

Components:

Cadusafos:

Species	:	Mouse, male
NOAEL	:	2,45 mg/kg
LOAEL	:	8 mg/kg
Application Route	:	Oral - feed
Exposure time	:	28 d
Dose	:	0.83, 2.45, 8.0
GLP	:	yes
Symptoms	:	Red blood cell acetylcholinesterase inhibition

Species	:	Rat, male
LOAEL	:	4,7 mg/kg
Application Route	:	Oral - feed
Exposure time	:	28 d
Dose	:	0, 4.7, 9.3, 19.6, 39.9, 56.2
GLP	:	yes
Symptoms	:	Red blood cell acetylcholinesterase inhibition

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Species	:	Rat, male and female
NOAEC	:	0,9 - 1,8 mg/l
Application Route	:	inhalation (vapor)
Exposure time	:	12 Months

hexamethylenediamine:

Species	:	Rat
NOEL	:	335 mg/kg
Application Route	:	Oral

Species	:	Rat
NOAEL	:	0,01 mg/kg
Application Route	:	inhalation (dust/mist/fume)
Target Organs	:	Nose, larynx
Symptoms	:	respiratory tract irritation

phosphoric acid:

Species	:	Rat, male and female
NOAEL	:	250 mg/kg
Application Route	:	Oral - gavage
Exposure time	:	42 - 54 d
Method	:	OECD Test Guideline 422

2-ethylhexanoic acid, copper salt:

Species	:	Mouse
NOAEL	:	180 - 205 mg/kg
Application Route	:	Oral
Exposure time	:	13 weeks

Species	:	Rat
NOAEL	:	2 mg/l
Application Route	:	Inhalation
Exposure time	:	28 d
Method	:	OECD Test Guideline 412

Naphthenic acids, copper salts:

Species	:	Mouse, male and female
NOAEL	:	1.000 mg/l
LOAEL	:	2.000 mg/l
Application Route	:	Ingestion
Method	:	Regulation (EC) No. 440/2008, Annex, B.26
Remarks	:	Based on data from similar materials

Aspiration toxicity

Based on available data, the classification criteria are not met.

Components:

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

May be fatal if swallowed and enters airways.

Experience with human exposure

Components:

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Skin contact	:	Symptoms: Repeated exposure may cause skin dryness or cracking.

Further information

Product:

Remarks	:	No data available

Components:

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Remarks	:	Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Prolonged and/or repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish	:	LC50 (Danio rerio (zebra fish)): 59,58 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0,00052 mg/l Exposure time: 48 h Method: OECD Test Guideline 202 EC50 (Daphnia similis (Water flea)): 0,00918 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	EC50 (Selenastrum capricornutum (green algae)): 53,60 mg/l End point: Growth inhibition Exposure time: 96 h
Toxicity to soil dwelling organisms	:	LC50 (Eisenia fetida (earthworms)): 328,91 mg/kg Exposure time: 14 d Method: OECD Test Guideline 216 Remarks: No significant adverse effect on Nitrogen mineralization. Method: OECD Test Guideline 217 Remarks: No significant adverse effect on Carbon mineralization.
Toxicity to terrestrial organisms	:	LD50 (Coturnix japonica (Japanese quail)): 650 mg/kg LD50 (Apis mellifera (bees)): 15.35 Exposure time: 48 h End point: Acute contact toxicity Method: OECD Test Guideline 214

Components:

Cadusafos:

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 0,13 mg/l Exposure time: 96 h LC50 (Lepomis macrochirus (Bluegill sunfish)): 0,14 - 0,21 mg/l Exposure time: 96 h LC50 (Salmo gairdneri): 0,11 - 0,15 mg/l Exposure time: 96 h Test Type: flow-through test
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 0,0004 - 0,0013 mg/l Exposure time: 48 h

Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants	:	EbC50 (Scenedesmus subspicatus): 4,3 mg/l Exposure time: 72 h GLP: yes
M-Factor (Acute aquatic toxicity)	:	1.000
Toxicity to fish (Chronic toxicity)	:	NOEC (Fish): 0,0052 mg/l Exposure time: 21 d
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Crustaceans): 0,00023 mg/l Exposure time: 21 d
M-Factor (Chronic aquatic toxicity)	:	100
Toxicity to soil dwelling organisms	:	NOEC (Eisenia fetida (earthworms)): 3,2 mg/kg Exposure time: 28 d GLP: yes
Toxicity to terrestrial organisms	:	LD50 (Apis mellifera (bees)): 1,86 µg/bee Exposure time: 48 h Remarks: Contact LD50 (Apis mellifera (bees)): 2,07 µg/bee Exposure time: 48 h Remarks: Oral LD50 (Colinus virginianus (Bobwhite quail)): 7,1 - 36,1 mg/kg GLP: yes LD50 (Anas platyrhynchos (Mallard duck)): 183 - 288 mg/kg GLP: yes

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Toxicity to fish	:	LL50 (Oncorhynchus mykiss (rainbow trout)): 2 - 5 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EL50 (Daphnia magna (Water flea)): 1,4 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EL50 (Pseudokirchneriella subcapitata (green algae)): 1 - 3 mg/l Exposure time: 24 h Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	EL50 (Daphnia magna (Water flea)): 0,89 mg/l Exposure time: 21 d Method: OECD Test Guideline 211

Toxicity to microorganisms	:	LL50 (Tetrahymena pyriformis): 677,9 mg/l Exposure time: 72 h Test Type: Growth inhibition

hexamethylenediamine:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 1.825 mg/l Exposure time: 4 d
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 19,8 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	EC50 (Pseudokirchneriella subcapitata (green algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 EC10 (Pseudokirchneriella subcapitata (green algae)): 118 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to microorganisms	:	EC10 (Anabaena flos-aquae (cyanobacterium)): 10 mg/l Exposure time: 72 h EC50 (Natural microorganism): 291 mg/l Exposure time: 3 h

phosphoric acid:

Toxicity to fish	:	LC50 (Lepomis macrochirus (Bluegill sunfish)): 3 - 3,25 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	:	EC50 (Desmodesmus subspicatus (green algae)): > 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201 NOEC (Desmodesmus subspicatus (green algae)): 100 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Toxicity to microorganisms	:	EC50 (activated sludge): > 1.000 mg/l Exposure time: 3 h Method: OECD Test Guideline 209

2-ethylhexanoic acid, copper salt:

Toxicity to fish	:	LC50 (Oryzias latipes (Orange-red killifish)): 180 mg/l Exposure time: 96 h Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 85,4 mg/l Exposure time: 48 h
Toxicity to algae/aquatic plants	:	NOEC (Lemna minor (duckweed)): 0,030 mg/l Exposure time: 7 d Remarks: Based on data from similar materials NOEC (Desmodesmus subspicatus (green algae)): 49,3 mg/l Exposure time: 96 h
Toxicity to fish (Chronic toxicity)	:	NOEC (Oncorhynchus mykiss (rainbow trout)): 0,0022 mg/l Exposure time: 21 d Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC (Daphnia magna (Water flea)): 25 mg/l Exposure time: 21 d Method: OECD Test Guideline 211 Chronic Toxicity Value (Daphnia magna (Water flea)): 75 mg/l Exposure time: 21 d Method: OECD Test Guideline 211 Chronic Toxicity Value (Daphnia magna (Water flea)): 63 mg/l Exposure time: 21 d Method: OECD Test Guideline 211
M-Factor (Chronic aquatic toxicity)	:	1
Toxicity to microorganisms	:	EC50 (Pseudomonas putida): 112,1 mg/l Exposure time: 17 h Method: DIN 38 412 Part 8

Naphthenic acids, copper salts:

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 38,4 µg/l Exposure time: 96 h Test Type: flow-through test Remarks: Based on data from similar materials LC50 (Pimephales promelas (fathead minnow)): 5,62 mg/l Exposure time: 96 h Method: OECD Test Guideline 203 Remarks: Based on data from similar materials
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 20 mg/l Exposure time: 48 h Test Type: semi-static test Method: OECD Test Guideline 202 Remarks: Based on data from similar materials
Toxicity to algae/aquatic plants	:	ErC50 (Pseudokirchneriella subcapitata (green algae)): 29,6 mg/l Exposure time: 72 h Test Type: Growth inhibition

Method: OECD Test Guideline 201
Remarks: Based on data from similar materials

M-Factor (Acute aquatic toxicity) : 10

Toxicity to fish (Chronic toxicity) : NOEC (Pimephales promelas (fathead minnow)): 18,9 µg/l
Exposure time: 7 d

NOEC (Fish): 120 µg/l
End point: mortality
Exposure time: 64 d
Method: OECD Test Guideline 204

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Ceriodaphnia dubia (water flea)): 6,3 µg/l
Exposure time: 7 d
Remarks: Based on data from similar materials

NOEC (Ceriodaphnia dubia (water flea)): 4 µg/l
Exposure time: 7 d
Remarks: Based on data from similar materials

M-Factor (Chronic aquatic toxicity) : 10

Toxicity to microorganisms : EC50 (Vibrio fischerii (Bacteria)): 13 mg/l
Exposure time: 48 h
Remarks: Based on data from similar materials

Persistence and degradability

Product:

Biodegradability : Result: Not readily biodegradable.

Components:

Cadusafos:

Biodegradability : Remarks: Not readily biodegradable.

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 58,6 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
Remarks: Based on data from similar materials

hexamethylenediamine:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 82 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

phosphoric acid:

Biodegradability : Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

2-ethylhexanoic acid, copper salt:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 99 %
Exposure time: 28 d
Method: OECD Test Guideline 301E

Naphthenic acids, copper salts:

Biodegradability : Result: Inherently biodegradable.
Remarks: Based on data from similar materials

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Bioaccumulation is unlikely.

Remarks: No data available

Components:

Cadusafos:

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 220

Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: 3,9

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Bioaccumulation : Remarks: The product/substance has a potential to bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3,72
Method: QSAR

hexamethylenediamine:

Partition coefficient: n-octanol/water : log Pow: 0,35

2-ethylhexanoic acid, copper salt:

Partition coefficient: n-octanol/water : log Pow: 2,96

Naphthenic acids, copper salts:

Bioaccumulation : Species: Oncorhynchus mykiss (rainbow trout)

Bioconcentration factor (BCF): 2
Exposure time: 4 d

Partition coefficient: n-octanol/water : log Pow: 7,65

Mobility in soil

Components:

Cadusafos:

Distribution among environmental compartments : Remarks: Moderately mobile in soils

Solvent naphtha (petroleum), heavy arom.; Kerosine — unspecified:

Distribution among environmental compartments : Remarks: Expected to partition to sediment and wastewater solids. Moderately volatile.

Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life with long lasting effects.

Components:

phosphoric acid:

Additional ecological information : Harmful effects on aquatic organisms also due to pH shift.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging : It is prohibited to reuse, bury, burn or sell packaging.

Washable packaging: Triple wash packs of less than 20 liters and pressure wash packs of 20 liters or more. Triple Wash (Manual Wash): Completely empty the contents of the package into the sprayer tank, keeping it in an upright position for 30 seconds; Add clean water to the package up to ¼ of its volume; Cover the package well and shake it for 30 seconds; Pour the wash water into the spray tank; Do this operation three times; Make the plastic or metal packaging unusable by perforating the bottom.

Pressure wash: Fit the empty package in the appropriate place of the funnel installed on the sprayer; Activate the mechanism to release the water jet; Direct the water jet to all the inside walls of the package, for 30 seconds; Wash water must be transferred to the sprayer tank; Make the plastic or metal packaging unusable by perforating the bottom. In both procedures, puncture the container at its base without damaging the label. Within a period of up to one year from the date of purchase, the user must return the empty packaging, with lid, to the establishment where the product was purchased or to the place indicated on the invoice, issued at the time of purchase.Activate the mechanism to release the water jet. Direct the water jet to all the inside walls of the package, for 30 seconds. Wash water must be transferred to the sprayer tank. Make the plastic or metal packaging unusable by perforating the bottom.

SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Cadusafos)
Class	:	9
Packing group	:	III
Labels	:	9
Environmentally hazardous	:	yes

IATA-DGR

UN/ID No.	:	UN 3082
Proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (Cadusafos)
Class	:	9
Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964

IMDG-Code

UN number	:	UN 3082
Proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Cadusafos)
Class	:	9
Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F

Marine pollutant : yes

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

Not applicable for product as supplied.

Domestic regulation

ANTT

UN number : UN 3082
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Cadusafos)

Class : 9
Packing group : III
Labels : 9
Hazard Identification Number : 90

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

Safety, health and environmental regulations/legislation specific for the substance or mixture

Law No. 14,785 of December 27, 2023. Decree 4,074 of January 4, 2002 and its regulatory standards. ANTT Resolution No. 5,998/22 of November 3, 2022. This MSDS was prepared in accordance with the criteria of ABNT NBR 14725. The user is recommended to pay attention to local regulations.

National List of Carcinogenic Agents for Humans - (LINACH) : Not applicable

Brazil. List of chemicals controlled by the Federal Police : urea
phosphoric acid

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

TCSI : On the inventory, or in compliance with the inventory

TSCA : Product contains substance(s) not listed on TSCA inventory.

AIIC : Not in compliance with the inventory

DSL : This product contains the following components that are not on the Canadian DSL nor NDSL.

Cadusafos

ENCS : Not in compliance with the inventory

ISHL : Not in compliance with the inventory

KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	Not in compliance with the inventory
NZIoC	:	Not in compliance with the inventory
TECI	:	Not in compliance with the inventory

SECTION 16. OTHER INFORMATION

Revision Date	:	15.05.2025
Date format	:	dd.mm.yyyy

Full text of other abbreviations

ACGIH	:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH / TWA	:	8-hour, time-weighted average
ACGIH / STEL	:	Short-term exposure limit

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; 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; 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; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; 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; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; 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; WHMIS - Workplace Hazardous Materials Information System

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