

OKS 2581

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4.1	01.03.2024	Date of first issue: 15.09.2023	04.03.2024

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product name : OKS 2581

Manufacturer or supplier's details

Company name of supplier : OKS Spezialschmierstoffe GmbH
Ganghoferstr. 47
D-82216 Maisach-Gernlinden
Tel.: +49 8142 3051 500
Fax.: +49 8142 3051 599
info@oks-germany.com

E-mail address of person responsible for the SDS : mcm@oks-germany.com
Emergency telephone number : +7 495 628 1687
+49 8142 3051 517

Recommended use of the chemical and restrictions on use

Recommended use : Corrosion inhibitor

Restrictions on use : Restricted to professional users.

2. HAZARDS IDENTIFICATION

GHS Classification (According to GOST 32423, GOST 32424 and GOST 32425)

Aerosols : Category 1
Skin irritation : Category 2
Eye irritation : Category 2A
Specific target organ toxicity - single exposure : Category 3 (Central nervous system)
Short-term (acute) aquatic hazard : Category 2
Long-term (chronic) aquatic hazard : Category 2

GHS-Labeling (According to GOST 31340)

Hazard pictograms :



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Signal word : Danger

Hazard statements : H222 Extremely flammable aerosol.
H229 Pressurised container: May burst if heated.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H336 May cause drowsiness or dizziness.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P211 Do not spray on an open flame or other ignition source.
P251 Do not pierce or burn, even after use.
P261 Avoid breathing mist.
P273 Avoid release to the environment.

Storage:
P410 + P412 Protect from sunlight. Do not expose to temperatures exceeding 50 °C/ 122 °F.

Other hazards which do not result in classification

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Pure substance/mixture : Mixture

Chemical nature : Contains solvents, lacquer base, metal and metal oxide powder.
Corrosion inhibitor

Components

Chemical name	Concentration (% w/w)	Occupational Exposure Limits		CAS-No.	EC-No.
		MAC value mg/m3 / TSEL value	Hazard Class		
butanone	>= 30 - < 50	MPC-TWA: 200 mg/m3 Data Source: RU OEL	4	78-93-3	201-159-0
		MPC-STEL: 400 mg/m3 Data Source: RU OEL	4		

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dimethyl ether	$\geq 30 - < 50$	MPC-TWA: 200 mg/m ³ Data Source: RU OEL MPC-STEL: 600 mg/m ³ Data Source: RU OEL	4 4	115-10-6	204-065-8
acetone	$\geq 10 - < 20$	MPC-TWA: 200 mg/m ³ Data Source: RU OEL MPC-STEL: 800 mg/m ³ Data Source: RU OEL	4 4	67-64-1	200-662-2
cyclopentanone	$\geq 1 - < 10$	No data available		120-92-3	204-435-9
zinc powder — zinc dust (stabilised)	$\geq 2,5 - < 10$	No data available		7440-66-6	231-175-3
iron	$\geq 1 - < 10$	MPC-TWA: 10 mg/m ³ Data Source: RU OEL	f, 4	7439-89-6	231-096-4
n-butyl acetate	$\geq 1 - < 2,5$	MPC-TWA: 50 mg/m ³ Data Source: RU OEL MPC-STEL: 200 mg/m ³ Data Source: RU OEL	4 4	123-86-4	204-658-1

4. FIRST AID MEASURES

If inhaled : Call a physician or poison control centre immediately.
Remove person to fresh air. If signs/symptoms continue, get

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- medical attention.
Keep patient warm and at rest.
If unconscious, place in recovery position and seek medical advice.
Keep respiratory tract clear.
If breathing is irregular or stopped, administer artificial respiration.
- In case of skin contact : Take off all contaminated clothing immediately.
Wash off immediately with soap and plenty of water.
Get medical attention immediately if irritation develops and persists.
Wash clothing before reuse.
Thoroughly clean shoes before reuse.
- In case of eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 10 minutes.
Seek medical advice.
- If swallowed : Move the victim to fresh air.
If accidentally swallowed obtain immediate medical attention.
Keep respiratory tract clear.
Do NOT induce vomiting.
Rinse mouth with water.
- Most important symptoms and effects, both acute and delayed : Inhalation may provoke the following symptoms:
Unconsciousness
Dizziness
Drowsiness
Headache
Nausea
Tiredness
Skin contact may provoke the following symptoms:
Erythema
Allergic appearance
Central nervous system depression
Causes skin irritation.
- Notes to physician : Treat symptomatically.

5. FIREFIGHTING MEASURES

Flammable properties

- Flash point : -42 °C
Method: Abel-Pensky
- Ignition temperature : 350 °C (1.013 hPa)

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Upper explosion limit / Upper flammability limit : 26,2 %(V)

Lower explosion limit / Lower flammability limit : 1 %(V)

Flammability (solid, gas) : Extremely flammable aerosol.

Suitable extinguishing media : ABC powder

Unsuitable extinguishing media : High volume water jet

Specific hazards during firefighting : Fire Hazard
Do not let product enter drains.
Contains gas under pressure; may explode if heated.
Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

Hazardous combustion products : Carbon oxides
Halogenated compounds
Metal oxides

Further information : Standard procedure for chemical fires.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Cool containers/tanks with water spray.

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
Use personal protective equipment.
Exposure to decomposition products may be a hazard to health.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Evacuate personnel to safe areas.
Ensure adequate ventilation.
Remove all sources of ignition.
Do not breathe vapours or spray mist.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Refer to protective measures listed in sections 7 and 8.
Only qualified personnel equipped with suitable protective equipment may intervene.

Environmental precautions : Do not allow contact with soil, surface or ground water.
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 : Contain spillage, and then collect with non-combustible

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containment and cleaning up absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
Keep in suitable, closed containers for disposal.
Non-sparking tools should be used.

7. HANDLING AND STORAGE

Advice on safe handling : Do not use in areas without adequate ventilation.
Do not breathe vapours or spray mist.
In case of insufficient ventilation, wear suitable respiratory equipment.
Avoid contact with skin and eyes.
For personal protection see section 8.
Keep away from fire, sparks and heated surfaces.
Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Smoking, eating and drinking should be prohibited in the application area.
Wash hands and face before breaks and immediately after handling the product.
Do not get in eyes or mouth or on skin.
Do not get on skin or clothing.
Do not ingest.
Do not use sparking tools.
These safety instructions also apply to empty packaging which may still contain product residues.
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use.

Conditions for safe storage : BEWARE: Aerosol is pressurized. Keep away from direct sun exposure and temperatures over 50 °C. Do not open by force or throw into fire even after use. Do not spray on flames or red-hot objects.
Store in accordance with the particular national regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Data Source
butanone	78-93-3	TWA	200 ppm	2000/39/EC

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			600 mg/m3	(2000-06-16)
		STEL	300 ppm 900 mg/m3	2000/39/EC (2000-06-16)
		MPC-TWA (vapour and/or gas)	200 mg/m3	RU OEL (2021-02-03)
Further information: Class 4 - Low hazard				
		MPC-STEL (vapour and/or gas)	400 mg/m3	RU OEL (2021-02-03)
Further information: Class 4 - Low hazard				
dimethyl ether	115-10-6	TWA	1.000 ppm 1.920 mg/m3	2000/39/EC (2000-06-16)
		MPC-TWA (vapour and/or gas)	200 mg/m3	RU OEL (2021-02-03)
Further information: Class 4 - Low hazard				
		MPC-STEL (vapour and/or gas)	600 mg/m3	RU OEL (2021-02-03)
Further information: Class 4 - Low hazard				
acetone	67-64-1	TWA	500 ppm 1.210 mg/m3	2000/39/EC (2000-06-16)
		MPC-TWA (vapour and/or gas)	200 mg/m3	RU OEL (2021-02-03)
Further information: Class 4 - Low hazard				
		MPC-STEL (vapour and/or gas)	800 mg/m3	RU OEL (2021-02-03)
Further information: Class 4 - Low hazard				
iron	7439-89-6	MPC-TWA (aerosol)	10 mg/m3	RU OEL (2021-02-03)
Further information: aerosols of predominantly fibrogenic action, Class 4 - Low hazard				
n-butyl acetate	123-86-4	STEL	150 ppm 723 mg/m3	2019/1831/E U (2019-10-31)
		TWA	50 ppm 241 mg/m3	2019/1831/E U (2019-10-31)
		MPC-TWA (vapour and/or gas)	50 mg/m3	RU OEL (2021-02-03)
Further information: Class 4 - Low hazard				
		MPC-STEL (vapour and/or gas)	200 mg/m3	RU OEL (2021-02-03)
Further information: Class 4 - Low hazard				

Engineering measures : Use only in an area equipped with explosion proof exhaust

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ventilation.
Handle only in a place equipped with local exhaust (or other appropriate exhaust).

Personal protective equipment

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines.

Filter type : Recommended Filter type:
Organic gas and low boiling vapour type

Hand protection
Material : butyl-rubber
Break through time : > 10 min
Protective index : Class 1

Remarks : Wear protective gloves. The break through time depends amongst other things on the material, the thickness and the type of glove and therefore has to be measured for each case.

Eye protection : Safety glasses with side-shields

Skin and body protection : Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

Protective measures : The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Hygiene measures : Wash face, hands and any exposed skin thoroughly after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : aerosol

Colour : silver

Odour : characteristic

Odour Threshold : No data available

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pH : Not applicable
substance/mixture is non-soluble (in water)

Melting point/range : No data available

Boiling point/boiling range : No data available

Flash point : -42 °C
Method: Abel-Pensky

Evaporation rate : No data available

Flammability (solid, gas) : Extremely flammable aerosol.

Self-ignition : No data available

Upper explosion limit / Upper
flammability limit : 26,2 %(V)

Lower explosion limit / Lower
flammability limit : 1 %(V)

Vapour pressure : 3.200 hPa (20 °C)

Relative vapour density : No data available

Relative density : 0,86 (20 °C)
Reference substance: Water
The value is calculated

Density : 0,86 g/cm³ (20 °C)

Bulk density : No data available

Solubility(ies)
Water solubility : insoluble

Solubility in other solvents : No data available

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

Auto-ignition temperature : 350 °C (1.013 hPa)

Decomposition temperature : No data available

Viscosity

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Viscosity, dynamic	:	No data available
Viscosity, kinematic	:	< 20,5 mm ² /s (40 °C)
Explosive properties	:	Not explosive
Oxidizing properties	:	No data available
Sublimation point	:	No data available

10. STABILITY AND REACTIVITY

Reactivity	:	No hazards to be specially mentioned.
Chemical stability	:	Stable under normal conditions.
Possibility of hazardous reactions	:	No dangerous reaction known under conditions of normal use.
Conditions to avoid	:	Heat, flames and sparks. Strong sunlight for prolonged periods. Risk of receptacle bursting.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	No decomposition if stored and applied as directed.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Product:

Acute oral toxicity	:	Acute toxicity estimate: > 5.000 mg/kg Method: Calculation method
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Remarks: Effects due to ingestion may include:

Symptoms: Central nervous system depression

Acute inhalation toxicity	:	Remarks: Respiration of solvent vapour may cause dizziness. Harmful by inhalation.
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Symptoms: Inhalation may provoke the following symptoms:,

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Respiratory disorder, Respiratory disorders, Dizziness, Drowsiness, Asthma, Shortness of breath, Vomiting, Fatigue, Vertigo, Central nervous system depression

Acute toxicity estimate: > 40 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: Calculation method

Acute dermal toxicity : Symptoms: Redness, Local irritation

Components:

butanone:

Acute oral toxicity : LD50 (Rat): 2.193 mg/kg
Method: OECD Test Guideline 423
GLP: yes

Acute inhalation toxicity : LC50 (Rat): 34 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity : LD50 (Rabbit): > 5.000 mg/kg
Method: OECD Test Guideline 402

dimethyl ether:

Acute inhalation toxicity : LC50 (Rat): 309 mg/l
Exposure time: 4 h
Test atmosphere: gas

acetone:

Acute oral toxicity : LD50 Oral (Rat): 5.800 mg/kg

cyclopentanone:

Acute oral toxicity : LD50 Oral (Rat): > 2.000 mg/kg

zinc powder — zinc dust (stabilised):

Acute oral toxicity : LD50 (Rat): > 2.000 mg/kg
Method: OECD Test Guideline 401

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GLP: yes
Assessment: The substance or mixture has no acute oral toxicity

Acute inhalation toxicity : LC50 (Rat): > 5,41 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
GLP: yes
Assessment: The substance or mixture has no acute inhalation toxicity

n-butyl acetate:

Acute oral toxicity : LD50 (Rat): 10.768 mg/kg

Acute inhalation toxicity : LC50 (Rat): > 21 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403
GLP: yes
Assessment: The substance or mixture has no acute inhalation toxicity

Acute dermal toxicity : LD50 (Rabbit): > 17.600 mg/kg

Skin corrosion/irritation

Product:

Result : Skin irritation

Remarks : Irritating to skin.

Components:

butanone:

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

Result : Repeated exposure may cause skin dryness or cracking.

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dimethyl ether:

Assessment	:	No skin irritation
Result	:	No skin irritation

cyclopentanone:

Species	:	Rabbit
Result	:	Skin irritation

zinc powder — zinc dust (stabilised):

Species	:	Rabbit
Assessment	:	No skin irritation
Result	:	No skin irritation

n-butyl acetate:

Species	:	Rabbit
Assessment	:	No skin irritation
Method	:	OECD Test Guideline 404
Result	:	Repeated exposure may cause skin dryness or cracking.

Serious eye damage/eye irritation

Product:

Remarks	:	Irritating to eyes.
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Components:

butanone:

Species	:	Rabbit
Result	:	Irritating to eyes.
Assessment	:	Irritating to eyes.
Method	:	OECD Test Guideline 405

dimethyl ether:

Result	:	No eye irritation
Assessment	:	No eye irritation

acetone:

Species	:	Rabbit
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Result : Eye irritation

cyclopentanone:

Species : Rabbit
Result : Eye irritation

zinc powder — zinc dust (stabilised):

Species : Rabbit
Result : No eye irritation
Exposure time : 24 h
Assessment : No eye irritation
Method : OECD Test Guideline 405
GLP : yes

n-butyl acetate:

Species : Rabbit
Result : No eye irritation
Assessment : No eye irritation
Method : OECD Test Guideline 405
GLP : yes

Respiratory or skin sensitisation

Product:

Remarks : May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Components:

butanone:

Test Type : Buehler Test
Species : Guinea pig
Assessment : Does not cause skin sensitisation.
Method : OECD Test Guideline 406
Result : Does not cause skin sensitisation.
GLP : yes

dimethyl ether:

Assessment : Does not cause skin sensitisation.
Result : Does not cause skin sensitisation.

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zinc powder — zinc dust (stabilised):

Species	:	Guinea pig
Assessment	:	Did not cause sensitisation on laboratory animals.
Method	:	OECD Test Guideline 406
Result	:	Did not cause sensitisation on laboratory animals.
GLP	:	yes

n-butyl acetate:

Test Type	:	Maximisation Test
Exposure routes	:	Dermal
Species	:	Guinea pig
Assessment	:	Does not cause skin sensitisation.
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.

Germ cell mutagenicity

Product:

Genotoxicity in vitro	:	Remarks: No data available
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Genotoxicity in vivo	:	Remarks: No data available
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Components:

butanone:

Germ cell mutagenicity - Assessment	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
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dimethyl ether:

Genotoxicity in vitro	:	Test Type: Ames test Method: OECD Test Guideline 471 Result: negative
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Genotoxicity in vivo	:	Species: Drosophila melanogaster (vinegar fly) Application Route: inhalation (gas) Method: OECD Test Guideline 477 Result: negative
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zinc powder — zinc dust (stabilised):

Germ cell mutagenicity - Assessment	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
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n-butyl acetate:

Genotoxicity in vitro	:	Test Type: Ames test Test system: Salmonella typhimurium Method: OECD Test Guideline 471 Result: negative
		Test Type: Chromosome aberration test in vitro Test system: Chinese hamster cells Method: OECD Test Guideline 473 Result: negative
Genotoxicity in vivo	:	Species: Mouse Application Route: Oral Method: OECD Test Guideline 474 Result: negative
Germ cell mutagenicity - Assessment	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects., Animal testing did not show any mutagenic effects.

Carcinogenicity

Product:

Remarks : No data available

Components:

butanone:

Carcinogenicity - Assessment : Not classifiable as a human carcinogen.

dimethyl ether:

Species	:	Rat
Application Route	:	inhalation (gas)
Exposure time	:	2 Years
	:	47 mg/l
Method	:	OECD Test Guideline 453
Result	:	negative

zinc powder — zinc dust (stabilised):

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Carcinogenicity - Assessment : No evidence of carcinogenicity in animal studies.

n-butyl acetate:

Carcinogenicity - Assessment : Not classifiable as a human carcinogen.

Reproductive toxicity

Product:

Effects on fertility : Remarks: No data available

Effects on foetal development : Remarks: No data available

Components:

butanone:

Reproductive toxicity - Assessment : - Fertility -
No toxicity to reproduction
- Teratogenicity -
No effects on or via lactation

dimethyl ether:

Reproductive toxicity - Assessment : - Fertility -
Animal testing did not show any effects on fertility.

zinc powder — zinc dust (stabilised):

Reproductive toxicity - Assessment : - Fertility -
No toxicity to reproduction
- Teratogenicity -
No effects on or via lactation

n-butyl acetate:

Effects on fertility : Test Type: Two-generation study
Species: Rat
Application Route: inhalation (vapour)
General Toxicity - Parent: NOAEC: 750 mg/l
General Toxicity F1: NOAEC: 750 mg/l
General Toxicity F2: NOAEC: 750 mg/l
Method: OECD Test Guideline 416

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Result: Embryotoxic effects and adverse effects on the offspring were detected.

Reproductive toxicity -
Assessment

: - Fertility -

No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

- Teratogenicity -

No toxicity to reproduction

STOT - single exposure

Product:

Remarks : No data available

Components:

butanone:

Exposure routes

: Inhalation

Target Organs

: Respiratory system

Assessment

: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects. May cause drowsiness or dizziness.

acetone:

Exposure routes

: Inhalation

Assessment

: May cause drowsiness or dizziness.

n-butyl acetate:

Exposure routes

: Inhalation

Target Organs

: Central nervous system

Assessment

: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with narcotic effects.

STOT - repeated exposure

Product:

Remarks : No data available

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Components:

butanone:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

n-butyl acetate:

Assessment : The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Repeated dose toxicity

Product:

Remarks : This information is not available.

Components:

n-butyl acetate:

Species	: Rat
NOAEL	: 125 mg/kg
Application Route	: Oral

Aspiration toxicity

Product:

This information is not available.

Components:

butanone:

No aspiration toxicity classification

dimethyl ether:

No aspiration toxicity classification

zinc powder — zinc dust (stabilised):

No aspiration toxicity classification



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n-butyl acetate:

No aspiration toxicity classification

Further information

Product:

Remarks : Risks of irreversible effects after a single exposure.
Ingestion causes irritation of upper respiratory system and gastrointestinal disturbance.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Product:

Toxicity to fish : Remarks: Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Toxicity to daphnia and other aquatic invertebrates : Remarks: No data available

Toxicity to algae/aquatic plants : Remarks: No data available

Toxicity to microorganisms : Remarks: No data available

Components:

butanone:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 2.993 mg/l
Exposure time: 96 h
Test Type: static test

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 308 mg/l
Exposure time: 48 h
Test Type: static test

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (green algae)): 1.972 mg/l

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Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201
GLP: yes

Toxicity to microorganisms : EC50 (*Pseudomonas putida*): 1.150 mg/l
Exposure time: 16 h
Test Type: static test
Method: DIN 38 412 Part 8

dimethyl ether:

Toxicity to fish : LC50 (*Poecilia reticulata* (guppy)): > 4.100 mg/l
Exposure time: 96 h
Test Type: semi-static test

Toxicity to daphnia and other : EC50 (*Daphnia magna* (Water flea)): > 4.400 mg/l
aquatic invertebrates Exposure time: 48 h
Test Type: static test

Toxicity to algae/aquatic : EC50 (green algae): 154,9 mg/l
plants Exposure time: 96 h

zinc powder — zinc dust (stabilised):

Toxicity to fish : LC50 (*Oncorhynchus kisutch* (coho salmon)): 0,727 mg/l
Exposure time: 96 h
Test Type: static test

Toxicity to daphnia and other : EC50 (*Daphnia magna* (Water flea)): 0,937 mg/l
aquatic invertebrates Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202

M-Factor (Acute aquatic : 1
toxicity)

M-Factor (Chronic aquatic : 1
toxicity)

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

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n-butyl acetate:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 18 mg/l
Exposure time: 96 h
Test Type: flow-through test
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia (water flea)): 44 mg/l
Exposure time: 48 h
Test Type: static test

Toxicity to algae/aquatic plants : EC50 (Desmodesmus subspicatus (green algae)): 397 mg/l
Exposure time: 72 h
Test Type: static test

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC (Daphnia magna (Water flea)): 23 mg/l
Exposure time: 21 d
Test Type: Reproduction Test
GLP: yes

Toxicity to microorganisms : EC50 (Tetrahymena pyriformis): 356 mg/l
Exposure time: 40 h
Test Type: Growth inhibition

Persistence and degradability

Product:

Biodegradability : Remarks: No data available

Physico-chemical removability : Remarks: No data available

Components:

butanone:

Biodegradability : aerobic
Inoculum: activated sludge
Result: rapidly biodegradable
Biodegradation: 98 %
Exposure time: 28 d
Method: OECD Test Guideline 301D
GLP: yes

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dimethyl ether:

Biodegradability : aerobic
Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 5 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

acetone:

Biodegradability : Result: rapidly biodegradable

cyclopentanone:

Biodegradability : Result: rapidly biodegradable

n-butyl acetate:

Biodegradability : Primary biodegradation
Result: rapidly biodegradable
Biodegradation: 83 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).
This mixture contains no substance considered to be very persistent and very bioaccumulating (vPvB).

Components:

butanone:

Bioaccumulation : Remarks: Due to the distribution coefficient n-octanol/water, accumulation in organisms is not expected.

Partition coefficient: n-octanol/water

: log Pow: 0,3 (40 °C)
Method: OECD Test Guideline 117
GLP: yes

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dimethyl ether:

Partition coefficient: n-octanol/water : log Pow: 0,07 (25 °C)

acetone:

Bioaccumulation : Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 0,2

cyclopentanone:

Bioaccumulation : Remarks: No data available

n-butyl acetate:

Partition coefficient: n-octanol/water : log Pow: 2,3 (25 °C)
pH: 7
Method: OECD Test Guideline 117
GLP: yes

Mobility in soil

Product:

Mobility : Remarks: No data available

Distribution among environmental compartments : Remarks: No data available

Other adverse effects

Product:

Additional ecological information : Toxic to aquatic life with long lasting effects.

Components:

butanone:

Results of PBT and vPvB assessment : Non-classified PBT substance Non-classified vPvB substance

dimethyl ether:

Results of PBT and vPvB assessment : Non-classified vPvB substance Non-classified PBT substance

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n-butyl acetate:

Results of PBT and vPvB assessment : Non-classified PBT substance Non-classified vPvB substance

Hygienic standards:

(Allowable concentration in air, water, including fishery waters, soil)

Components	Air	Water	Soil	Data Source
butanone	TSEL value: 0,1 mg/m ³	Maximum Allowable Concentration: 1 mg/l Limiting health hazard indicator: organoleptic; changes the smell of water Hazard class: Class 3 - moderately dangerous	No data available	List 2 List 4
dimethyl ether	TSEL value: 0,2 mg/m ³	Maximum Permissible Concentration: 1 Milligrams per cubed decimeter Limiting health hazard indicator: toxic Hazard class: 4 Maximum Allowable Concentration: 5 mg/l Limiting health hazard indicator: sanitary-toxicological Hazard class: Class 4 - low hazard	No data available	List 2 List 4 List 5
acetone	Concentration that prevents irritation, reflex reactions, odors when exposed to 20-30 minutes - maximum one-time: 0,35 mg/m ³ Limiting health hazard indicator:	Maximum Permissible Concentration: 0,05 Milligrams per cubed decimeter Limiting health hazard indicator: toxic Hazard class: 3	No data available	List 1 List 4 List 5

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	reflectory Hazard class: Class 4 - low hazard	Maximum Allowable Concentration: 2,2 mg/l Limiting health hazard indicator: general sanitary Hazard class: Class 3 - moderately dangerous		
zinc powder — zinc dust (stabilised)	No data available	Maximum Permissible Concentration: 0,01 Milligrams per cubed decimeter Limiting health hazard indicator: toxic Hazard class: 3 Maximum Permissible Concentration: 0,05 Milligrams per cubed decimeter Limiting health hazard indicator: toxic Hazard class: 3 Maximum Allowable Concentration: 5 mg/l Limiting health hazard indicator: sanitary- toxicological Hazard class: Class 3 - moderately dangerous	ODC value: 55 mg/kg ODC value: 110 mg/kg ODC value: 220 mg/kg Approximately permissible concentration considering the background: 55 mg/kg Hazard class: Class 1 - extremely dangerous Approximately permissible concentration considering the background: 110 mg/kg Hazard class: Class 1 - extremely dangerous Approximately permissible concentration considering the background: 220 mg/kg Hazard class: Class 1 - extremely dangerous Maximum allowable	List 4 List 5 List 6 List 7

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			concentration considering the background: 23 mg/kg Limiting health hazard indicator: Translocation Hazard class: Class 1 - extremely dangerous	
iron	No data available	Maximum Permissible Concentration: 0,1 Milligrams per cubed decimeter Limiting health hazard indicator: toxic Hazard class: 4 Maximum Permissible Concentration: 0,05 Milligrams per cubed decimeter Limiting health hazard indicator: toxic Hazard class: 2	No data available	List 5
n-butyl acetate	Concentration that prevents irritation, reflex reactions, odors when exposed to 20-30 minutes - maximum one-time: 0,1 mg/m ³ Limiting health hazard indicator: reflectory Hazard class: Class 4 - low hazard	Maximum Permissible Concentration: 0,3 Milligrams per cubed decimeter Limiting health hazard indicator: sanitary and toxicological effects Hazard class: 4 Maximum Allowable Concentration: 0,1 mg/l Limiting health hazard indicator: general sanitary Hazard class: Class 4 - low hazard	No data available	List 1 List 4 List 5



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For explanation of abbreviations see section 16.

13. DISPOSAL CONSIDERATIONS

Disposal methods

- Waste from residues : Do not dispose of with domestic refuse.
Dispose of as hazardous waste in compliance with local and national regulations.
- Contaminated packaging : Packaging that is not properly emptied must be disposed of as the unused product.
Offer empty spray cans to an established disposal company.
Pressurized container: Do not pierce or burn, even after use.
- The following Waste Codes are only suggestions:
- Waste Code : unused product, packagings not completely emptied
16 05 04**, gases in pressure containers (including halons)
containing hazardous substances

14. TRANSPORT INFORMATION

ADR

- UN number : UN 1950
Proper shipping name : AEROSOLS
Class : 2
Packing group : Not assigned by regulation
Labels : 2.1
Tunnel restriction code : (D)
Environmentally hazardous : yes

IATA-DGR

- UN/ID No. : UN 1950
Proper shipping name : Aerosols, flammable
Class : 2.1
Packing group : Not assigned by regulation
Labels : Flammable Gas
Packing instruction (cargo aircraft) : 203
Packing instruction (passenger aircraft) : 203

IMDG-Code

- UN number : UN 1950
Proper shipping name : AEROSOLS
(zinc powder - zinc dust (stabilized))



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Class	:	2.1
Packing group	:	Not assigned by regulation
Labels	:	2.1
EmS Code	:	F-D, S-U
Marine pollutant	:	yes

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

Not applicable for product as supplied.

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.

15. REGULATORY INFORMATION

National regulatory information

Federal Law of 21.07.1997 No. 116-FZ (amended on 11.06.2021) "On industrial safety of hazardous production facilities".

Federal Law of 24.06.1998 No. 89-FZ (amended on 02.07.2021) "On production and consumption waste".

Federal Law of 30.03.1999 No. 52-FZ (amended on 02.07.2021) "On the Sanitary and Epidemiological Well-Being of the Population" (amended and supplemented, entered into force on 31.10.2021).

Federal Law of 04.05.1999 No. 96-FZ "On the protection of atmospheric air" (as amended on December 8, 2020).

Federal Law of 27.12.2002 No. 184-FZ (amended on 02.07.2021) "On Technical Regulation" (amended and supplemented, entered into force on 01.09.2021).

Federal Law of 10.01.2002 No. 7-FZ (amended on 02.07.2021) "On environmental protection".

Federal Law of 22.07.2008 No. 123-FZ "Technical Regulations on Fire Safety Requirements"
TECHNICAL REGULATIONS OF THE CUSTOMS UNION TR CU 030/2012 On requirements for lubricants, oils and special fluids (amended on 03.03.2017).

International Regulations

Montreal Protocol : Not applicable

Rotterdam Convention (Prior Informed Consent) : Not applicable

Stockholm Convention (Persistent Organic Pollutants) : Not applicable

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16. OTHER INFORMATION

List of data sources used in the preparation of the Safety Data Sheet

GOST 30333-2007. Interstate standard. Safety data sheet for chemical products. Primary requirements.

GOST 12.1.004-91 System of labor safety standards (SSBT). Fire safety. General requirements.

GOST 12.1.007-76 Occupational safety standards system. Noxious substances. Classification and general safety requirements

GOST 12.1.044-89 SSBT. Fire and explosion hazard of substances and materials. Nomenclature of indicators and methods for their determination.

GOST 12.4.021 System of labor safety standards (SSBT). Ventilation systems. General requirements.

GOST 12.4.137-2001 Special footwear with leather uppers for protection against oil, oil products, acids, alkalis, non-toxic and explosive dust. Technical conditions.

GOST 12.4.252-2013 System of labor safety standards (SSBT). Means of individual protection of hands. Gloves. General technical requirements. Test methods.

GOST 14192-96. Interstate standard. Cargo marking. Minsk, 1998.

GOST 19433-88 Dangerous goods. Classification and labeling.

GOST 31340-2013. Interstate standard. Precautionary labeling of chemical products. General requirements.

GOST 32419-2013 Classification of the hazard of chemical products. General requirements.

GOST 32421-2013 Classification of chemical products, the hazard of which is due to physical and chemical properties. Test methods for explosive chemical products.

GOST 32423-2013 Hazard classification of mixed chemical products by their effects on the body.

GOST 32424-2013 Classification of the hazard of chemical products by their impact on the environment. Basic provisions.

GOST 32425-2013 Hazard classification of mixed chemical products in terms of environmental impact.

GOST R 53264-2019 Fire fighting equipment. Special protective clothing for firefighters. General technical requirements. Test methods.

GOST R 53265-2019 Fire fighting equipment. Personal protective equipment for the feet of the firefighter. General technical requirements. Test methods.

GOST R 53268-2009 Fire fighting equipment. Fire rescue belts. General technical requirements. Test methods.

GOST R 53269-2019 Fire fighting equipment. Firefighters helmets. General technical requirements. Test methods.

SanPiN 1.2.2353-08 "Carcinogenic factors and basic requirements for the prevention of carcinogenic hazard".

SanPiN 1.2.3685-21 "Hygienic standards and requirements for ensuring the safety and (or) harmlessness to humans of environmental factors" dated 28.01.2021.

SanPiN 2.1.3684-21 "Sanitary and epidemiological requirements for the maintenance of the territories of urban and rural settlements, for water bodies, drinking water and drinking water supply, atmospheric air, soils, living quarters, the operation of industrial, public premises, the organization and implementation of sanitary and anti-epidemic (preventive) measures".

SanPiN 2.2.0.555-96. 2.2. Labor hygiene. Hygienic requirements for working conditions for women. Sanitary rules and regulations.

Carriage of dangerous goods, International maritime dangerous goods (IMDG) code.

Water quality standards for fishery water bodies, including standards for maximum permissible concentrations of harmful substances in the waters of fishery water bodies (approved by order of the Ministry of Agriculture of Russia dated December 13, 2016 No. 552).

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Regulations for the carriage of dangerous goods (Appendix 1 and 2) to the Agreement on International Goods Transport by Rail (SMGS), 2009.
Agreement on International Goods Transport by Rail (SMGS).
UN Recommendations on the Transport of Dangerous Goods. Typical rules. Twenty-second revised edition. United Nations, New York and Geneva, 2021.
Montreal Protocol (Ozone Depleting Substances)
Stockholm Convention (Persistent Organic Pollutants)

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Acute	: Short-term (acute) aquatic hazard
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Eye Irrit.	: Eye irritation
Flam. Gas	: Flammable gases
Flam. Liq.	: Flammable liquids
Press. Gas	: Gases under pressure
Skin Irrit.	: Skin irritation
STOT SE	: Specific target organ toxicity - single exposure
2000/39/EC	: Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
2019/1831/EU	: Europe. Commission Directive 2019/1831/EU establishing a fifth list of indicative occupational exposure limit values
RU OEL	: SanPiN 1.2.3685-21 Table 2.1, Table 2.8, Table 2.16 & Table 2.17 Maximum permissible concentrations (MPC) in the air of the working area
2000/39/EC / TWA	: Limit Value - eight hours
2000/39/EC / STEL	: Short term exposure limit
2019/1831/EU / TWA	: Limit Value - eight hours
2019/1831/EU / STEL	: Short term exposure limit
RU OEL / MPC-STEL	: Maximum Permissible Concentration - Short Term Exposure
RU OEL / MPC-TWA	: Maximum Permissible Concentration - Time Weighted Average
List 1	: SanPiN 1.2.3685-21 Table 1.1, Table 1.10, & Table 1.11 Maximum permissible concentration (MPC) in the air of urban and rural settlements
List 2	: SanPiN 1.2.3685-21 Table 1.2, Table 1.12 & Table 1.13 Tentative Safe Exposure Levels (TSEL) in the air of urban and rural settlements
List 4	: SanPiN 1.2.3685-21 Table 3.13, Table 3.15, Table 3.16 & Table 3.17 Maximum permissible concentrations (MPC) of chemicals in the water of drinking systems of centralized, including hot, and non-centralized water supply, water of underground and surface water bodies of domestic drinking and cultural and domestic water use, water of swimming pools, water parks
List 5	: Order of the Russian Federal Fisheries Agency "Standards of maximum permissible concentrations of harmful substances in fishery water bodies"
List 6	: GN 2.1.7.2511-09 Guiding permissible concentration (GPC) of chemical substances in soil
List 7	: SanPiN 1.2.3685-21 Table 4.1, Table 4.2, Table 4.7, Table



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4.8, Table 4.9 & Table 4.10 Maximum allowable concentration (MPC) and approximate allowable concentration (APC) of chemicals in the soil

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; 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; 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; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; 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; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECL - 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

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