SECTION 1: Identification

1.1 Product identifier

Trade name **TCFL 8.0**

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

Relevant identified uses: High performance thermally conductive gel, silicone based thermal interface material

1.3 Details of the supplier of the safety data sheet

TCLAD
1600 Orrin Road
Prescott Wisconsin 54021
United States

Telephone: 715 262 8206

1.4 Emergency telephone number

Emergency information service: CHEMTREC Tel: 1-800-424-9300
This number is only available during the following office hours: Mon-Fri 09:00 AM - 05:00 PM

SECTION 2: Hazard(s) identification

2.1 Classification of the substance or mixture

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

Section	Hazard class	Category	Hazard class and category	Hazard statement
A.9	specific target organ toxicity - repeated exposure	2	STOT RE 2	H373

For full text of abbreviations: see SECTION 16.

The most important adverse physicochemical, human health and environmental effects
Delayed or immediate effects can be expected after short or long-term exposure.

2.2 Label elements

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

- Signal word: warning
- Pictograms

GHS08

- Hazard statements

H373 May cause damage to organs through prolonged or repeated exposure.

- Precautionary statements

P260 Do not breathe dust/fume/gas/mist/vapors/spray.
P314 Get medical advice/attention if you feel unwell.

- Precautionary statements
P501 Dispose of contents/container to industrial combustion plant.

- Hazardous ingredients for labelling Aluminium nitride

2.3 Other hazards

Hazards not otherwise classified

May be harmful if swallowed (GHS category 5: acutely toxic - oral).
Very toxic to aquatic life with long lasting effects (GHS category 1: aquatic toxicity - acute and/or chronic).

Results of PBT and vPvB assessment

Does not contain a PBT-/vPvB-substance at a concentration of ≥ 0.1%.

Endocrine disrupting properties

Does not contain an endocrine disruptor (ED) in a concentration of ≥ 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
Aluminium nitride	CAS No 24304-00-5	50 – < 75	STOT RE 2 / H373 cD / OSHA003	
Aluminum oxide	CAS No 1344-28-1	50 – < 75	Acute Tox. 4 / H332 cD / OSHA003	

Remarks

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. Provide fresh air.

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, BC-powder, Carbon dioxide (CO2)

Unsuitable extinguishing media

Water jet

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products

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.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it. If substance has entered a water course or sewer, inform the responsible authority.

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

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

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

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

- Packaging compatibilities

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

7.3 Specific end use(s)

See section 16 for a general overview.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Ceiling-C [ppm]	Ceiling-C [mg/m³]	Notation	Source
US	alpha-alumina	1344-28-1	REL							appx-D	NIOSH REL
US	alpha-alumina	1344-28-1	PEL		15					dust	29 CFR 1910.1000
US	alpha-alumina	1344-28-1	PEL		5					r	29 CFR 1910.1000
US	aluminium, insoluble compounds	1344-28-1	TLV®		1					r	ACGIH® 2024
US	aluminium oxide	1344-28-1	PEL (CA)		10					dust	Cal/OSHA PEL
US	aluminium oxide	1344-28-1	PEL (CA)		5					r	Cal/OSHA PEL

Notation

appx-D	see Appendix D - Substances with No Established RELs
Ceiling-C	ceiling value is a limit value above which exposure should not occur
dust	as dust
r	respirable fraction
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**
Aluminium nitride	24304-00-5	DNEL	0.47 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Aluminium nitride	24304-00-5	DNEL	0.034 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
Aluminum oxide	1344-28-1	DNEL	3 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
Aluminum oxide	1344-28-1	DNEL	3 mg/m³	human, inhalatory	worker (industry)	chronic - local effects

Relevant PNECs of components						
Name of substance	**CAS No**	**Endpoint**	**Threshold level**	**Organism**	**Environmental compartment**	**Exposure time**
Aluminium nitride	24304-00-5	PNEC	1.98 µg/l	aquatic organisms	freshwater	short-term (single instance)
Aluminium nitride	24304-00-5	PNEC	0.2 µg/l	aquatic organisms	marine water	short-term (single instance)
Aluminium nitride	24304-00-5	PNEC	1 mg/l	aquatic organisms	sewage treatment plant (STP)	short-term (single instance)

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

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

Physical state	liquid
Color	white - yellow

Particle	not relevant (liquid)

Odor	odorless

Other safety parameters

pH (value)	not determined
Melting point/freezing point	not determined
Initial boiling point and boiling range	2,980 °C
Flash point	not determined
Evaporation rate	not determined
Flammability (solid, gas)	not relevant, (fluid)
Vapor pressure	0 hPa at 20 °C
Density	not determined
Vapor density	this information is not available
Relative density	3.3 (water = 1)
Solubility(ies)	not determined

Partition coefficient

- n-octanol/water (log KOW)	this information is not available
Auto-ignition temperature	
Viscosity	not determined
Explosive properties	none
Oxidizing properties	none
9.2 Other information	there is no additional information

SECTION 10: Stability and reactivity

10.1 Reactivity

Concerning incompatibility: see below "Conditions to avoid" and "Incompatible materials".

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).

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

Acute toxicity

Shall not be classified as acutely toxic.
GHS of the United Nations, annex 4: May be harmful if swallowed.

Acute toxicity estimate (ATE) of components

Name of substance	CAS No	Exposure route	ATE
Aluminium nitride	24304-00-5	oral	3,470 $^{mg}/_{kg}$
Aluminum oxide	1344-28-1	inhalation: dust/mist	>2.3 $^{mg}/_{l}$/4h

Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

Serious eye damage/eye irritation

Shall not be classified as seriously damaging to the eye or eye irritant.

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

May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

SECTION 12: Ecological information

12.1 Toxicity

Very toxic to aquatic life with long lasting effects.

Aquatic toxicity (acute) of components

Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Aluminium nitride	24304-00-5	LC50	0.57 $^{mg}/_{l}$	rainbow trout (Oncorhynchus mykiss)	96 h
Aluminium nitride	24304-00-5	EC50	≥10.02 $^{mg}/_{l}$	green algae (Desmodesmus subspicatus)	72 h
Aluminum oxide	1344-28-1	LC50	11.5 $^{mg}/_{l}$	rainbow trout (Oncorhynchus mykiss)	48 h
Aluminum oxide	1344-28-1	EC50	>50 $^{mg}/_{l}$	zebra fish (Danio rerio)	96 h

Aquatic toxicity (chronic) of components

Name of substance	CAS No	Endpoint	Value	Species	Exposure time
Aluminium nitride	24304-00-5	LC50	731.5 $^{mg}/_{l}$	zebra fish (Danio rerio)	120 h
Aluminum oxide	1344-28-1	LC50	22.4 $^{mg}/_{l}$	fathead minnow (Pimephales promelas)	192 h
Aluminum oxide	1344-28-1	EC50	1,453 $^{µg}/_{l}$	fathead minnow (Pimephales promelas)	7 d

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

Does not contain a PBT-/vPvB-substance at a concentration of ≥ 0.1%.

12.6 Endocrine disrupting properties

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

12.7 Other adverse effects

Data are not available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packages

Only packagings which are approved (e.g. acc. to DOT) may be used. Completely emptied packages can be recycled.

Handle contaminated packages in the same way as the substance itself.

Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

SECTION 14: Transport information

14.1 UN number

DOT	UN 3082
IMDG-Code	UN 3082
ICAO-TI	UN 3082

14.2 UN proper shipping name

DOT	Environmentally hazardous substance, liquid, n.o.s.
IMDG-Code	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
ICAO-TI	Environmentally hazardous substance, liquid, n.o.s.

14.3 Transport hazard class(es)

DOT	9
IMDG-Code	9
ICAO-TI	9

14.4 Packing group

DOT	III
IMDG-Code	III
ICAO-TI	III

14.5 Environmental hazards hazardous to the aquatic environment

14.6 Special precautions for user

There is no additional information.

14.7 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	UN3082, Environmentally hazardous substance, liquid, n.o.s., 9, III
Danger label(s)	9, fish and tree

Environmental hazards	yes (hazardous to the aquatic environment)
Special provisions (SP)	8, 146, 173, 335, 441, IB3, T4, TP1, TP29

ERG No	171

International Maritime Dangerous Goods Code (IMDG) - Additional information

Marine pollutant	yes (hazardous to the aquatic environment) (Aluminium nitride)
Danger label(s)	9, fish and tree

Special provisions (SP)	274, 335, 375, 969
Excepted quantities (EQ)	E1
Limited quantities (LQ)	5 L
EmS	F-A, S-F
Stowage category	A

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

Environmental hazards	yes (hazardous to the aquatic environment)
Danger label(s)	9, fish and tree

Special provisions (SP)	A97, A158, A197, A215
Excepted quantities (EQ)	E1
Limited quantities (LQ)	30 kg

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) — all ingredients are listed (ACTIVE) or exempt from listing

Superfund Amendment and Reauthorization Act (SARA TITLE III)

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

none of the ingredients are listed

- Specific Toxic Chemical Listings (EPCRA Section 313)

Toxics Release Inventory: Specific Toxic Chemical Listings			
Name of substance	**CAS No**	**Remarks**	**Effective date**
Aluminum oxide	1344-28-1	fibrous forms	1987-01-01

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

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

none of the ingredients are listed

Clean Air Act

none of the ingredients are listed

Right to Know Hazardous Substance List

- Cleaning Product Right to Know Act Substance List (CA-RTK)

none of the ingredients are listed

- Toxic or Hazardous Substance List (MA-TURA)

Name of substance	CAS No	DEP CODE	PBT / HHS / LHS	PBT / HHS Threshold	De Minimis Concentration Threshold
Aluminum oxide	1344-28-1				1.0 %

- Hazardous Substances List (MN-ERTK)

Name of substance	CAS No	References	Remarks
Aluminum oxide	1344-28-1	A	
Aluminum oxide	1344-28-1	A	

Legend

A American Conference of Governmental Industrial Hygienists (ACGIH), "Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices for 1992-93", available from ACGIH

- Hazardous Substance List (NJ-RTK)

Name of substance	CAS No	Remarks	Classifications
Aluminum oxide	1344-28-1		

- Hazardous Substance List (Chapter 323) (PA-RTK)

Name acc. to inventory	CAS No	Classification
ALUMINUM OXIDE (AL2O3)	1344-28-1	E

Legend

E Environmental hazard

- Hazardous Substance List (RI-RTK)

Name of substance	CAS No	References
Aluminum oxide	1344-28-1	T
Aluminum oxide	1344-28-1	T

Legend

T Toxicity (ACGIH®)

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

none of the ingredients are listed

Industry or sector specific available guidance(s)

NPCA-HMIS® III

Hazardous Materials Identification System. American Coatings Association.

Category	Rating	Description
Chronic	*	chronic (long-term) health effects may result from repeated overexposure
Health	0	no significant risk to health
Flammability	0	material that will not burn under typical fire conditions
Physical hazard	0	material that is normally stable, even under fire conditions, and will not react with water, polymerize, decompose, condense, or self-react. Non-explosive
Personal protection	-	

NFPA® 704

National Fire Protection Association: Standard System for the Identification of the Hazards of Materials for Emergency Response (United States).

Category	Degree of hazard	Description
Flammability	0	material that will not burn under typical fire conditions
Health	0	material that, under emergency conditions, would offer no hazard beyond that of ordinary combustible material
Instability	0	material that is normally stable, even under fire conditions
Special hazard		

National inventories

Country	Inventory	Status
US	TSCA	all ingredients are listed (ACTIVE)

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

Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
1.4	Emergency information service: This number is only available during the following office hours: Mon-Fri 09:00 AM - 05:00 PM	Emergency information service: CHEMTREC Tel: 1-800-424-9300 This number is only available during the following office hours: Mon-Fri 09:00 AM - 05:00 PM	yes
2.1		Classification acc. to OSHA "Hazard Communication Standard" (29 CFR 1910.1200): change in the listing (table)	yes
2.2		- Pictograms: change in the listing (table)	yes

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
2.2		- Hazard statements: change in the listing (table)	yes
2.2		- Precautionary statements: change in the listing (table)	yes
2.2	- Hazardous ingredients for labelling: Aluminium nitride, Aluminum oxide	- Hazardous ingredients for labelling: Aluminium nitride	yes
5.1	Suitable extinguishing media: Water, Foam, ABC-powder	Suitable extinguishing media: Water spray, BC-powder, Carbon dioxide (CO2)	yes
6.3	Advice on how to contain a spill: Covering of drains, Take up mechanically	Advice on how to contain a spill: Covering of drains	yes
6.3	Advice on how to clean up a spill: Take up mechanically.	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	yes
6.3		Appropriate containment techniques: Use of adsorbent materials.	yes
7.2	Managing of associated risks		yes
7.2	- Explosive atmospheres: Removal of dust deposits.		yes
7.2	- Ventilation requirements: Keep any substance that emits harmful vapors or gases in a place that allows these to be permanently extracted.		yes
8.2	Hand protection: Wear protective gloves.	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.	yes
9.1	Physical state: solid	Physical state: liquid	yes
9.1		Particle: not relevant (liquid)	yes
9.1	pH (value): not applicable	pH (value): not determined	yes
9.1	Flash point: not applicable	Flash point: not determined	yes
9.1	Flammability (solid, gas): non-combustible	Flammability (solid, gas): not relevant, (fluid)	yes
9.1	Explosion limits of dust clouds: not determined		yes
9.1	Auto-ignition temperature: ≥400 °C	Auto-ignition temperature	yes
9.1	Viscosity: not relevant (solid matter)	Viscosity: not determined	yes
9.2	Other information	other information:	yes

Section	Former entry (text/value)	Actual entry (text/value)	Safety-relevant
		there is no additional information	
9.2	Liquid content: 10 %		yes
9.2	Solid content: 100 %		yes
11.1	Acute toxicity: Harmful if inhaled.GHS of the United Nations, annex 4: May be harmful if swallowed.	Acute toxicity: Shall not be classified as acutely toxic.GHS of the United Nations, annex 4: May be harmful if swallowed.	yes
11.1		- Acute toxicity estimate (ATE): change in the listing (table)	yes
14.1	DOT: UN 3077	DOT: UN 3082	yes
14.1	IMDG-Code: UN 3077	IMDG-Code: UN 3082	yes
14.1	ICAO-TI: UN 3077	ICAO-TI: UN 3082	yes
14.2	DOT: Environmentally hazardous substance, solid, n.o.s.	DOT: Environmentally hazardous substance, liquid, n.o.s.	yes
14.2	IMDG-Code: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.	IMDG-Code: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.	yes
14.2	ICAO-TI: Environmentally hazardous substance, solid, n.o.s.	ICAO-TI: Environmentally hazardous substance, liquid, n.o.s.	yes
14.7	Particulars in the shipper's declaration: UN3077, Environmentally hazardous substance, solid, n.o.s., 9, III	Particulars in the shipper's declaration: UN3082, Environmentally hazardous substance, liquid, n.o.s., 9, III	yes
14.7	Special provisions (SP): 8, 146, 335, 384, 441, A112, B54, B120, IB8, IP3, N20, N91, T1, TP33	Special provisions (SP): 8, 146, 173, 335, 441, IB3, T4, TP1, TP29	yes
14.7	Special provisions (SP): 274, 335, 375, 966, 967, 969	Special provisions (SP): 274, 335, 375, 969	yes
14.7	Limited quantities (LQ): 5 kg	Limited quantities (LQ): 5 L	yes
14.7	Special provisions (SP): A97, A158, A179, A197, A215	Special provisions (SP): A97, A158, A197, A215	yes
15.1		NPCA-HMIS® III: change in the listing (table)	yes
15.1		NFPA® 704: change in the listing (table)	yes

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

Abbr.	Descriptions of used abbreviations
ACGIH®	American Conference of Governmental Industrial Hygienists
ACGIH® 2024	From ACGIH®, 2024 TLVs® and BEIs® Book. Copyright 2024. 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
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)
cD	Combustible dust
Ceiling-C	Ceiling value
DEP CODE	Department of Environmental Protection Code
DGR	Dangerous Goods Regulations (see IATA/DGR)
DNEL	Derived No-Effect Level
DOT	Department of Transportation (USA)
EC50	Effective Concentration 50 %. The EC50 corresponds to the concentration of a tested substance causing 50 % changes in response (e.g. on growth) during a specified time interval
ED	Endocrine disruptor
EmS	Emergency Schedule
ERG No	Emergency Response Guidebook - Number
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
HHS	Higher hazard substance
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
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
LC50	Lethal Concentration 50%: the LC50 corresponds to the concentration of a tested substance causing 50 % lethality during a specified time interval
LHS	Lower hazard substance
NIOSH REL	National Institute for Occupational Safety and Health (NIOSH): Recommended Exposure Limits (RELs)
NPCA-HMIS® III	National Paint and Coatings Association: Hazardous Materials Identification System - HMIS® III, Third Edition
OSHA	Occupational Safety and Health Administration (United States)
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)

Abbr.	Descriptions of used abbreviations
STEL	Short-term exposure limit
STOT RE	Specific target organ toxicity - repeated exposure
TLV®	Threshold Limit Values
TWA	Time-weighted average
vPvB	Very Persistent and very Bioaccumulative

Key literature references and sources for data

OSHA Hazard Communication Standard (HCS), 29 CFR 1910.1200.

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).

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

Code	Text
H332	Harmful if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure.
OSHA003	May form combustible dust concentrations in air.

Disclaimer

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