1. Identification of the substance / Preparation and Company:

Identification of the substance or preparation:

Commercial product name: Zirkon BioStar Lava

Company / Manufacturer:

SILADENT Dr. Böhme & Schöps GmbH
Im Klei 26
D - 38644 Goslar
0 53 21 / 37 79 – 0
0 53 21 / 38 96 32
info@siladent.de / www.siladent.de

2. Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008): No classification.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

No labelling required

2.3 Other hazards

This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).

Zirconium dioxide: This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Hafnium dioxide: This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

Yttrium oxide: This substance is not considered to be persistent, bioaccumulating and toxic (PBT).

3. Composition/information on ingredients

3.1 Mixtures

Chemical nature: Mixture

Hazardous components

Chemical Name	CAS-No. EC-No. Registration number	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]
zirconium dioxide	1314-23-4 215-227-2 01-2119486976-14		88 - 96
hafnium dioxide	12055-23-1 235-013-2 /		1 - 5
yttrium oxide	1314-36-9 215-233-5 /		4 - 6

4. First aid measures

4.1 Description of first aid measures

If inhaled: Remove to fresh air.
If symptoms persist, call a physician.

In case of skin contact: Wash off with soap and water.

If swallowed: Obtain medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms: No information available.

Risks: No information available.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment: No information available.

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media: The product itself does not burn, Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting: None known.

Hazardous combustion products: None known.

5.3 Advice for firefighters

Special protective equipment for firefighters: In the event of fire, wear self-contained breathing apparatus.

Further information: Prevent fire extinguishing water from contaminating surface water or the ground water system.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions: Use personal protective equipment.
Avoid dust formation.
Avoid dust accumulation in enclosed space.

6.2 Environmental precautions: Do not flush into surface water or sanitary sewer system.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up: Use mechanical handling equipment.
Pick up and transfer to properly labelled containers.

6.4 Reference to other sections: For personal protection see section 8.

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling: Avoid dust formation. Provide sufficient air exchange and/or exhaust in work rooms. Avoid exceeding the given occupational exposure limits (see section 8).

Advice on protection against fire and explosion: No special precautions required.

Hygiene measures: Handle in accordance with good industrial hygiene and safety practice. Keep working clothes separately.

Dust explosion class: No data available.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers: Store in accordance with the particular national regulations.

Further information on storage conditions: Store in tightly closed containers in a dry place.

7.3 Specific end use(s)

Specific use(s): No data available.

8. Exposure controls/personal protection

8.1 Control parameters

Components	CAS-No.	Value type (Form of exposure	Control parameters	Update	Basis
zirconium dioxide	1314-23-4	TWA	5 mg/m3	2005-04-06	GB EH40
Further information	:	Zirconium			
		STEL	10 mg/m3	2005-04-06	GB EH40
Further information	:	Zirconium			

DNEL

Zirconium dioxide:	End Use: Workers Exposure routes: Skin contact Potential health effects: Long-term systemic effects Value: > 15.75 mg/kg No data available End Use: Workers Exposure routes: Inhalation Potential health effects: Long-term systemic effects Value: 5 mg/m3
Hafnium dioxide:	No data available.
Yttrium oxide:	No data available

PNEC

Zirconium dioxide:	No data available.
Hafnium dioxide:	No data available.
Yttrium oxide:	No data available.

8.2 Exposure controls

Engineering measures

Dust must be extracted directly at the point of origin.

Personal protective equipment

Eye protection	Safety glasses
Hand protection	
Material:	Chemical resistant gloves made of butyl rubber or nitrile rubber category III according to EN 374.
Remarks:	The data about break through time/strength of material is not valid for undissolved solids/dust.
Skin and body protection:	Protective suit
Respiratory protection:	Respiratory protective device with particle filter EN 143.
Environmental exposure controls	
General advice:	Do not flush into surface water or sanitary sewer system.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	disc, block, cylinder, customer-specific form
Colour:	white
Odour:	odourless
Odour Threshold:	No data available.
pH:	No data available.
Melting point/range:	No data available.
Flash point:	Not applicable.
Flammability:	Negative.
Lower explosion limit:	No data available.
Upper explosion limit:	No data available.
Vapour pressure:	No data available.
Relative vapour density:	Remarks: Not applicable.
Density:	2.9 - 3.5 g/cm3
Water solubility:	No data available
Partition coefficient: noctanol/water:	Not applicable.
Auto-ignition temperature:	Not auto-flammable.
Thermal decomposition:	Not applicable.
Viscosity, dynamic:	Not applicable.
Viscosity, kinematic:	Not applicable.
Explosive properties:	Not explosive.
Oxidizing properties:	Not oxidizing.

9.2 Other information

Burning number:	1
Flammability (contact with water):	Not highly flammable.

10. Stability and reactivity

10.1	Reactivity	No hazards to be specially mentioned.
10.2	Chemical stability	Stable under normal conditions.
10.3	Possibility of hazardous reactions	
	Hazardous reactions:	None known.
10.4	Conditions to avoid:	None known.
10.5	Incompatible materials	
	Materials to avoid:	None known.
10.6	Hazardous decomposition products:	
	Other information:	Not applicable.

11. Toxicological information

11.1 Information on toxicological effects

Product

Acute oral toxicity:	No data available.
Acute inhalation toxicity:	No data available.
Acute dermal toxicity:	No data available.
Skin corrosion/irritation:	No data available.
Serious eye damage/eye Irritation:	No data available.
Respiratory or skin sensitisation:	No data available.
Germ cell mutagenicity	
Genotoxicity in vitro:	No data available.
Genotoxicity in vivo:	No data available.
Carcinogenicity:	No data available.
Reproductive toxicity:	No data available.
Teratogenicity:	No data available.
STOT - single exposure:	Remarks: No data available.
Repeated dose toxicity:	Remarks: No data available.
STOT - repeated exposure:	Remarks: No data available.
Further information:	For risk assessment data of relevant ingredients: None known.
Components:	
Zirconium dioxide :	
Acute oral toxicity:	LD50 Rat, female: > 5,000 mg/kg Method: OECD Test Guideline 423 GLP: No data available
Acute inhalation toxicity:	LC50 Rat, male and female: 4.3 mg/l Exposure time: 4 h Aerosol Method: OECD Test Guideline 436 GLP: No data available Remarks: An LC50/inhalation/4h/rat could not be determined because no mortality of rats was observed at the maximum achievable concentration.
Acute dermal toxicity:	No data available.
Skin corrosion/irritation:	Species: Rabbit Exposure time: 4 h Result: No skin irritation Method: OECD Test Guideline 404
Serious eye damage/eye Irritation:	Species: Rabbit Exposure time: 1 h Result: No eye irritation Method: OECD Test Guideline 405

Respiratory or skin sensitisation:	Test Method: Maximisation Test (GPMT) Species: Guinea pig Result: Does not cause skin sensitisation. Method: OECD Test Guideline 406
Germ cell mutagenicity	
Genotoxicity in vitro:	Type: Ames test Test species: Salmonella typhimurium with and without metabolic activation Result: negative Method: OECD Test Guideline 471 GLP: No data available Type: Chromosome aberration test in vitro Test species: Human lymphocytes with and without metabolic activation Result: negative Method: OECD Test Guideline 473 GLP: No data available Type: In vitro gene mutation study in mammalian cells Test species: L5178Y cells (mouse lymphoma) with and without metabolic activation Result: negative Method: OECD Test Guideline 476 GLP: No data available
Genotoxicity in vivo:	No data available.
Carcinogenicity:	No data available.
Reproductive toxicity:	No data available.
Teratogenicity:	No data available.
STOT - single exposure:	Assessment: The substance or mixture is not classified as specific target organ toxicant, single exposure.
Repeated dose toxicity:	Rat, male and female: NOAEL: 3,150 - 7,080 mg/kg Application Route: Oral Exposure time: 90-day Method: OECD Test Guideline 408 Test substance: CH2O7Zr2 (CAS-No. 5219-64-4) Remarks: Read-across (Analogy)
STOT - repeated exposure:	Assessment: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Further information:	None known.
Hafnium(IV) oxide :	
Acute oral toxicity:	No data available.
Acute inhalation toxicity:	No data available.
Acute dermal toxicity:	No data available.
Skin corrosion/irritation:	No data available.
Serious eye damage/eye Irritation:	No data available.
Respiratory or skin sensitisation:	No data available.
Germ cell mutagenicity	
Genotoxicity in vitro:	No data available.
Genotoxicity in vivo:	No data available.
Carcinogenicity:	No data available.
Reproductive toxicity:	No data available.
Teratogenicity:	No data available.
STOT - single exposure:	Remarks: No data available.
Repeated dose toxicity:	Remarks: No data available.
STOT - repeated exposure:	Remarks: No data available.
Further information:	None known.

Yttrium oxide :	
Acute oral toxicity:	LD50 Rat: > 5,000 mg/kg Method: No information available. GLP: No information available.
Acute inhalation toxicity:	No data available.
Acute dermal toxicity:	No data available Species: Rabbit
Skin corrosion/irritation:	Exposure time: 24 h Result: No skin irritation Method: No information available.
Serious eye damage/eye Irritation:	Result: Mild eye irritation Method: No information available.
Respiratory or skin sensitisation:	No data available.
Germ cell mutagenicity	
Genotoxicity in vitro:	No data available.
Genotoxicity in vivo:	No data available.
Carcinogenicity:	No data available.
Reproductive toxicity:	No data available.
Teratogenicity:	No data available.
STOT - single exposure:	Remarks: No data available.
Repeated dose toxicity:	Remarks: No data available.
STOT - repeated exposure:	Remarks: No data available.
Further information:	None known.

12. Ecological information

Toxicity	
Product:	
Toxicity to fish:	No data available.
Toxicity to daphnia and other aquatic invertebrates:	No data available.
Toxicity to algae:	No data available.
Toxicity to bacteria:	No data available.
Toxicity to fish (Chronic toxicity):	No data available.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):	No data available.
Toxicity to soil dwelling organisms:	No data available.
Toxicity to terrestrial organisms:	No data available.
Components:	
Zirconium dioxide :	
Toxicity to fish:	LC50 (Danio rerio (zebra fish)): > 100 mg/l Exposure time: 96 h Test Method: static test Method: OECD Test Guideline 203 GLP: No data available Fresh water
Toxicity to daphnia and other aquatic invertebrates:	EC50 (Daphnia magna (Water flea)): > 100 mg/l Exposure time: 48 h Test Method: static test Method: Directive 67/548/EEC, Annex V, C.2. GLP: No data available Fresh water
Toxicity to algae:	NOEC (Desmodesmus subspicatus): 0.004 mg/l Exposure time: 72 h Test Method: static test Test substance: Reaction mass of cerium dioxide and zirconium dioxide (909-709-8)

	Method: OECD Test Guideline 201 GLP: yes Fresh water Weight of Evidence Read-across (Analogy)
Toxicity to fish (Chronic toxicity):	No data available.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):	No data available.
Toxicity to soil dwelling Organisms:	No data available.
Plant toxicity:	NOEC: >= 264 mg/kg Species: Lycopersicon esculentum Test substance: Cl2OZr (CAS-No. 7699-43-6) Method: EPA OPPTS 850.4230 GLP: No data available Read-across (Analogy)
Toxicity to terrestrial organisms:	No data available.
Hafnium(IV) oxide :	
Toxicity to fish:	No data available
Toxicity to daphnia and other aquatic invertebrates:	No data available.
Toxicity to algae:	No data available.
Toxicity to bacteria:	No data available.
Toxicity to fish (Chronic toxicity):	No data available.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):	No data available.
Toxicity to soil dwelling:	No data available.
Yttrium oxide :	
Toxicity to fish:	No data available.
Toxicity to daphnia and other aquatic invertebrates:	No data available.
Toxicity to algae:	No data available.
Toxicity to bacteria:	No data available.
Toxicity to fish (Chronic toxicity):	No data available.
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity):	No data available.
Toxicity to soil dwelling organisms:	No data available.
Plant toxicity:	No data available.
Toxicity to terrestrial organisms:	No data available.

12.1 Persistence and degradability

Product:	
Biodegradability:	The methods for determining biodegradability are not applicable to inorganic substances.
Stability in water:	No data available.
Components:	
Zirconium dioxide :	
Biodegradability:	The methods for determining biodegradability are not applicable to inorganic substances.
Stability in water:	No data available.
Hafnium(IV) oxide :	
Biodegradability:	The methods for determining biodegradability are not applicable to inorganic substances.
Stability in water:	No data available

	Yttrium oxide :	
	Biodegradability:	The methods for determining biodegradability are not applicable to inorganic substances.
	Stability in water:	No data available
12.3	Bioaccumulative potential	
	Product:	
	Bioaccumulation:	This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).
	Partition coefficient: noctanol/water:	Not applicable.
	Components:	
	Zirconium dioxide :	
	Bioaccumulation:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
	Partition coefficient: noctanol/water:	Not applicable.
	Hafnium(IV) oxide :	
	Bioaccumulation:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
	Partition coefficient: noctanol/water:	Not applicable.
	Yttrium oxide :	
	Bioaccumulation:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
	Partition coefficient: noctanol/water:	Not applicable
12.4	Mobility in soil	
	Product:	
	Mobility:	No data available.
	Components:	
	Zirconium dioxide :	
	Mobility	No data available.
	Hafnium(IV) oxide :	
	Mobility:	No data available.
	Yttrium oxide :	
	Mobility:	No data available.
12.5	Results of PBT and vPvB assessment:	
	Product:	
	Assessment:	This mixture contains no substance considered to be persistent, bioaccumulating and toxic (PBT).
	Components:	
	Zirconium dioxide :	
	Assessment	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
	Hafnium(IV) oxide:	
	Assessment:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
	Yttrium oxide :	
	Assessment:	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).
12.6	Other adverse effects	
	Product:	
	Ozone-Depletion Potential:	No data available.
	Additional ecological information:	No information on ecology is available. None known.
	Components:	
	Zirconium dioxide :	
	Ozone-Depletion Potential:	No data available.

Additional ecological information:	None known.
Hafnium(IV) oxide	
Ozone-Depletion Potential:	No data available.
Additional ecological information:	None known.
Yttrium oxide :	
Ozone-Depletion Potential:	No data available
Additional ecological information:	None known.

13. Disposal considerations

13.1 Waste treatment methods

Product:	In accordance with local and national regulations. This product cannot be classified with disposal identification key acc. to the EU disposal directives as a classification results from the intended utilisation purpose of the consumer.

14. Transport information

14.1	UN number	
	ADR:	Not dangerous goods.
	IMDG:	Not dangerous goods.
	IATA:	Not dangerous goods.
14.2	UN proper shipping name	
	ADR:	Not dangerous goods.
	IMDG:	Not dangerous goods.
	IATA:	Not dangerous goods.
14.3	Transport hazard class(es)	
	ADR:	Not dangerous goods.
	IMDG:	Not dangerous goods.
	IATA:	Not dangerous goods.
14.4	Packing group	
	ADR:	Not dangerous goods.
	IMDG:	Not dangerous goods.
	IATA:	Not dangerous goods.
14.5	Environmental hazards	
	ADR:	Not dangerous goods.
	IMDG:	Not dangerous goods.
	IATA:	Not dangerous goods.
14.6	Special precautions for user	
	Remarks:	For personal protection see section 8.
14.7	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	
	Remarks:	No data available.

15. Regulatory information

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

Major Accident Hazard Legislation Seveso II - Directive 2003/105/EC amending Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances	Update: Not applicable
15.2 Chemical Safety Assessment	no

16. Other information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.