Revision n. 28, 06 February 2023 (First emission: January 1994). This revision replaces revision n. 27.

1. IDENTIFICATION OF THE MIXTURE AND OF THE COMPANY

1.1 Product identifier

- Commercial name: **ZBA, Zinc Borate Anhydrous**
- Chemical formula: $Zn_4B_{12}O_{22}$
- Chemical name/synonyms: Hexaboron Dizinc Undecaoxide, Zinc Borate Anhydrous
- Chemical family: Inorganic Borates
- REACH registration number: 01-2119691658-19-0001
- CAS number: 12767-90-7
- EINECS number: 235-804-2
- INDEX number: N.A.
- UFI number: N.A.

1.2 Relevant identified uses of the mixture and uses advised against

Binding agent, chemical production, complexing agent, corrosion inhibitors and anti-scaling agents, flame retardants, flux agents for casting, intermediate, laboratory chemicals, lubricants and lubricant additives, oxidising agents, photosensitive agents and other photo-chemicals, pH-regulating agents, plating agents and metal surface treating agents, process regulator (other than polymerisation or vulcanization processes), process regulator (used in polymerisation or vulcanization processes), processing aid not otherwise listed, stabilisers surface active agents, viscosity modifiers.

A complete list of uses is provided into the exposure scenarios.

Uses advised against: Consumer uses are included with a concentration limit of ≤ 0.29 %. Consumer uses with higher concentrations are advised against.

1.3 Details of the supplier of the safety data sheet

SCL Italia SpA
Headquarter: Via F. Filzi 25/A, 20124 Milano, ITALY
Tel. +39-02-677168.1
Fax +39-02-677168.20
http://www.larderellogroup.com
e-mail: scarpelli@larderellogroup.com

1.4 Emergency number

- For advice on chemical emergencies, spillages, fires, or First Aid:
  - *Primary phone number: **1-800-424-9300** (24hrs toll-free number)*
  - *for Central America: **+52 55 8526 4930** (24hrs not-toll-free number)*
  - *for South America: +55 11 4349 1359 (24hrs not-toll-free number)*
- SCL Italia spa: **+39-0588-68803** (8:00 – 17:00, Mon – Fri, CET, GMT +1 Nov/Mar, GMT +2 Apr/Oct).

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

The product is classified as dangerous according to OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200). The product, therefore, requires a safety data sheet. Any additional information regarding risks to health and/or the environment are reported in sections 11 and 12 of this sheet.

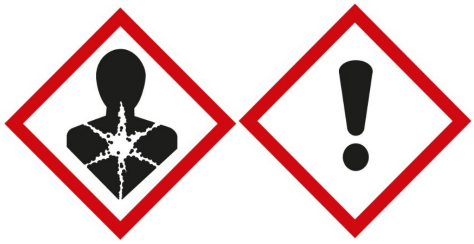
Hazard classification and indication:

Germ cell mutagenicity, category 2. H341: Suspected of causing genetic defects.

Toxic to Reproduction, category 2, H361. May damage fertility or the unborn child.

Eye irritation, category 2, H319. Causes serious eye irritation.

Hazard pictograms:



Signal word: warning

Hazard statements

- H341: Suspected of causing genetic defects.
- H361: May damage fertility or the unborn child.
- H319: Causes serious eye irritation.

Precautionary statements

Prevention

- P202: Do not handle until all safety precautions have been read and understood.
- P201: Obtain special instructions before use.
- P280: wear protective gloves/protective clothing/eye protection/face protection.
- P264: Wash hands thoroughly after handling.

Reaction

- P305 + P313 + P338: IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing.
- P308 + P313: IF exposed or concerned get medical advice/attention
- P337 + 313: If eye irritation persists get medical advice/attention.

Storage

- P405: Store locked up.

Disposal

- P501: Dispose of contents/container to respect local regulation.

2.2 Other hazards

Environmental classification according to regulation (EC) 1272/2008 (CLP).

The product is classified as dangerous for the environment under the provisions of Regulation (EC) 1272/2008 (CLP).

Hazard classification and indication:
Toxic to aquatic life, acute toxicity, category 1, H400. Very toxic to aquatic life.
Toxic to aquatic life, chronic toxicity, category 2, H411. Toxic to aquatic life with long-lasting effects.

Hazard pictograms:

Signal word: warning
Hazard statements

- H400: Very toxic to aquatic life
- H411: Toxic to aquatic life with long-lasting effects.

Precautionary statements
Prevention

- P273: avoid release to the environment

Reaction

- P391: collect spillage

Storage
--
Disposal

- P501: Dispose of contents/container to respect local regulation.

Additional hazards
N.D.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical name	Conc. (%)	CE	CAS	INDEX	Reg. REACH	1272/2008 (CLP) classification
Zinc Borate Anhydrous	C > 99.9	235-804-2*	12767-90-7	--	01-2119691658-19-0001	Muta. 2 H341, Repr. 2 H361, Eye Irrit. 2 H319, Aquatic Acute 1 H400 M=1, Aquatic Chronic 2 H411

*For one EINECS number you can have more than one CAS number.

The full wording of the hazard statements (H) is given in section 16 of the sheet.

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eyes: remove any contact lenses. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids well. Consult a doctor if the problem persists.

Skin: take off contaminated clothing. Wash immediately and abundantly with water for at least 15 minutes. If irritation persists, consult a doctor. Wash the contaminated garments before reusing them.

Inhalation: take the person to fresh air. If breathing is difficult, call a doctor right away.

Ingestion: consult a doctor immediately. Induce vomiting only on medical advice. Do not give anything by mouth if the subject is unconscious and if not authorized by the doctor.

4.2 Most important symptoms and effects, both acute and delayed

No specific information on the symptoms and effects caused by the product is known.

4.3 Indication of any immediate medical attention and special treatment needed

Note to physicians: supportive care only is required for adult ingestion of less than a few grams of the product. For ingestion of larger amounts, maintain fluid and electrolyte balance and maintain adequate kidney function. Gastric lavage is only recommended for heavily exposed, symptomatic patients in whom emesis has not emptied the stomach. Hemodialysis should be reserved for patients with massive acute absorption, especially for patients with compromised renal function.

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: the extinguishing media are traditional ones, that is carbon dioxide, powder and nebulized water.

Unsuitable extinguishing media: none.

5.2 Special hazards deriving from the mixture

Avoid breathing combustion products.

5.3 Advice for firefighters

General information: cool the containers with jets of water to avoid product decomposition and the development of substances potentially hazardous to health. Always wear full fire protection equipment. Collect the extinguishing water which must not be discharged into the sewers. Dispose of the contaminated water used for extinguishing and the residue of the fire according to current regulations.

Equipment: normal fire-fighting clothing, such as self-contained open-circuit compressed air breathing apparatus (EN 137), flame retardant suit (EN 469), flame retardant gloves (EN 659) and fire brigade boots (HO A29 or A30)

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions protective equipment and emergency procedures

Stop the loss if there is no danger.

Wear suitable protective equipment (including personal protective equipment referred to in section 8 of the safety data sheet) to prevent contamination of skin, eyes, and personal clothing. These indications are valid for both processing workers and emergency interventions.

6.2 Environmental precautions

Prevent the product from entering sewers, surface water, groundwater.

6.3 Methods and material for containment and cleaning up

Suck up the leaked product into a suitable container. Evaluate the compatibility of the container to be used with the product, checking section 10. Absorb the remainder with inert absorbent material.

Provide sufficient ventilation of the place affected by the leak. The disposal of contaminated material must be carried out in accordance with the provisions of point 13.

6.4 Reference to other sections

Any information regarding personal protection and disposal is given in sections 8 and 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Handle the product after consulting all the other sections of this safety data sheet. Avoid the dispersion of the product into the environment. Do not eat, drink, or smoke during use. Remove contaminated clothing and protective equipment before entering the eating area.

7.2 Conditions for safe storage, including any incompatibilities

No special handling precautions are required, however storage in a closed and dry place is recommended.

Keep only in the original container. Keep the containers tightly closed. Keep containers away from any

incompatible materials, checking section 10.

To preserve the integrity of the packaging:

- manipulate the bags based on the principle "first-in, first-out"
- tore in cool, dry, and well-ventilated place, away from strong reducing agents
- keep preferably at a temperature between 20°C and 35°C.
- avoid high air humidity
- avoid sunlight exposure
- avoid temperatures under **-5 °C** and over **40°C**.

7.3 Specific end use(s)

See exposure scenarios.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

8.1 Control parameters

Occupational exposure limits: in the absence of national occupational exposure limit values, SCL Italia SpA recommends and applies an internal occupational exposure limit **1mg B/m³**. To convert product into equivalent Zinc content multiple by 0,352. To convert product into equivalent Boron content multiple by 0,175.

Substance: Zinc Borate Anhydrous

Threshold limit value						
Type	**Country**	**8h -TWA**		**15'- STEL**		**Note**
		mg/m³	ppm	mg/m³	ppm	
TLV-ACGIH	-	2	-	-	-	Inhalable

Environment	**PNEC**
Fresh water	2.9mg B/l
Marine water	2.9mg B/l
Sediment in fresh water	NEA
Sediment in marine water	NEA
Water, intermittent release	VND
STP	10mg/l
Secondary poisoning (food chain)	NPI
Soil	5.7mg B/kg soil dw
Air	NPI

DNEL - Workers				
Route of exposure	**Acute local effects**	**Acute systemic effects**	**Local chronic effects**	**Long-term systemic effects**
Oral	VND	VND	VND	VND
Inhalation	NPI	0,69mg/m³	NPI	2.48mg/m³
Dermal	NPI	NPI	NPI	35,49mg/kg bw/day

DNEL - Population				
Route of exposure	**Acute local effects**	**Acute systemic effects**	**Local chronic effects**	**Long-term systemic effects**
Oral	VND	NPI	VND	0,507mg/kg bw/day
Inhalation	NPI	NEA	0,12mg/m^3	0,88mg/m^3
Dermal	NPI	NPI	NPI	25,35mg/kg bw/day

Legend: VND: hazard identified but no DNEL / DMEL available; NEA: no exposure expected; NPI: no hazards identified.

8.2 Exposure controls

The use of adequate technical measures should always have priority over personal protective equipment, ensure good ventilation in the workplace through effective local aspiration.

Personal protective equipment must comply with current regulations.

Hand protection: if long contact with the product is expected, it is recommended to protect hands with penetration-resistant work gloves (OSHA 29 CFR 1910.138).

Skin protection: wear category I work clothes with long sleeves and safety footwear for professional use. Wash with soap and water after removing protective clothing.

Eye protection: it is recommended to wear airtight safety goggles (OSHA 29 CFR 1910.133).

Respiratory protection: not necessary, unless otherwise indicated in the chemical risk assessment.

Environmental Exposure Controls: Emissions from production processes, including from production equipment, should be controlled for compliance with environmental protection legislation.

Residues must not be discharged without control into wastewater or water courses.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 General information

- Appearance: crystalline solid (powder)
- Colour: white
- Odour: odourless
- Melting or freezing point: >300°C
- Boiling point: N.D., melting point >300°C
- Flammability: N.A., not flammable, explosive or combustible
- Upper explosion limit: N.A., not flammable
- Lower explosion limit: N.A., not flammable
- Flash point: N.A., inorganic substance
- Self-ignition temperature: N.A. not self-heating
- Decomposition temperature: N.D., product does not decompose if stored at recommended conditions
- pH a 20°C: 8.0 (1g/l water solution)
- Kinematic viscosity: N.D., solid substance

- Solubility: <1% at 20°C in water
- Octanol / water partition coefficient: <2% based on Zinc
- Vapor pressure: negiglible at 25°C
- Density: 0.6kg/dm^3 at 23° C
- Vapor density: N.D., melting point >300°C
- Particle characteristics: N.D., product is not a nanoparticle

9.2 Other informations

9.2.1 Information relating to the classes of physical hazards

Does not contain organic solvents.

9.2.2 Other security features

Molecular weight: 371.63

10. STABILITY AND REACTIVITY

10.1 Reactivity

There are no particular dangers of reaction with other substances in normal conditions of use.

10.2 Chemical stability

The product is stable under normal conditions of use and storage.

10.3 Possibility of hazardous reactions

Under normal conditions of use and storage no dangerous reactions are foreseeable.

10.4 Conditions to avoids

None. Store the product in accordance with good industrial practice.

10.5 Incompatible materials

None. Store the product in accordance with good industrial practice.

10.6 Hazardous decomposition products

None.

11. TOXICOLOGICAL INFORMATIONS

11.1 Information on toxicological effects

Acute toxicity

Zinc Borate Anhydrous

LD50 (Oral): >5g/kg (Rat)

LD50 (Dermal): >5000mg/kg (Rat)
LC50 (Inhalation mists/dusts): 4.95mg/l/4h (Rat).

Skin corrosion/skin irritation
Based on the available data, the classification criteria are not met.

Severe eye damage/eye irritation
Cause serious eye irritation.

Respiratory or skin sensitization
Based on the available data, the classification criteria are not met.

Mutagenicity
Suspected of causing genetic defects.

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

Reproductive toxicity
May damage fertility or the unborn child.

Specific target organ toxicity (STOT) – Single exposure
Based on the available data, the classification criteria are not met.

Specific target organ toxicity (STOT) – Repeated exposure
Based on the available data, the classification criteria are not met.

Danger in case of aspiration
Based on the available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATIONS

The product is to be considered as dangerous for the environment and has a high toxicity for aquatic organisms. The product is to be considered as dangerous for the environment and has toxicity to aquatic organisms with long-term negative effects for the aquatic environment.

12.1 Toxicity

Data values are expressed as Zinc ion or Boron equivalents. To convert to this product, divide the Zinc equivalent by 0,352 and divide the Boron equivalent by 0,175. Studies judged to be unreliable or with insufficient

information to evaluate are not included. All toxicity values are reported as added concentrations, i.e. with subtraction of the background.

Product	Test	Result	Species	Exposure
Zinc	Invertebrate	EC50 0.147mg/l (as Zn)	Ceriodaphnia dubia	Fresh water - Acute
	Fish	LC50 0.169mg/l (as Zn)	Oncorhynchus mykiss	Fresh water – Acute
	Algae	LC50 0.136mg/l (as Zn)	Pseudokirchneriella subcapitata	Fresh water – Acute
	Invertebrate	NOEC 0.037mg/l (as Zn)	Ceriodaphnia dubia	Fresh water - Chronic
	Fish	NOEC 0.044mg/l (as Zn)	Jordanella floridae	Fresh water – Chronic
	Algae	NOEC 0.019mg/l (as Zn)	Pseudokirchneriella subcapitata	Fresh water – Chronic
Boron	Algae	EC50 52.4mg/l (as B)	Pseudokirchneriella subcapitata	Fresh water – Acute
	Invertebrate	LC50 91mg/l (as B)	Ceriodaphnia dubia	Fresh water – Acute
	Fish	LC50 79.7mg/l (as B)	Pimephales promelas	Fresh water – Acute
	Fish	NOEC 6.4mg/l (as B)	Brachydanio rerio	Fresh water – Chronic
	Invertebrate	NOEC 14.2mg/l (as B)	Daphnia magna	Fresh water – Chronic

12.2 Persistence and degradability

Biodegradation is not an applicable endpoint since the product is an inorganic substance.

12.3 Bio accumulative potential

This product will undergo hydrolysis in water to form undissociated boric acid. Boric acid will not bio magnify through the food chain.

12.4 Mobility in soil

The product is hydrolyzed in water and is leachable through normal soil.

12.5 Results of PBT and vPvB assessment

Based on the available criteria, the product does not contain PBT and vPvB in percentage ≥ 0.1%.

12.6 Other adverse effects

None

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Reuse if possible. Product residues are to be considered special hazardous waste. The dangerousness of the waste that partially contains this product must be evaluated according to the laws in force.

Disposal must be entrusted to an authorized waste management company, in compliance with national and possibly local regulations. The transport of waste may be subject to ADR.

Contaminated packaging: must be sent for recovery or disposal in compliance with national waste management regulations.

14. TRANSPORT INFORMATIONS

14.1 ON number or ID number

ADR/RID, IMDG, IATA: 3077.

ADR/RID: this product is not regulated as a dangerous good when transported in sizes of ≤5kg or 5lt, provided the packaging meet the general provisions 375.

IMDG: this product is not regulated as a dangerous good when transported in sizes of ≤5kg or 5lt, provided the packaging meet the Section 2.10.2.7.

IATA: This product is not regulated as a dangerous good when transported in sizes of ≤5kg or 5lt, provided the packaging meet the general provisions A197.

14.2 UN proper shipping name

ADR/RID: MATERIA PERICOLOSA PER L'AMBIENTE, SOLIDA N.A.S. (Borato di Zinco)
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Borate).

IMDG: MATERIA PERICOLOSA PER L'AMBIENTE, SOLIDA N.A.S. (Borato di Zinco)
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Borate).

IATA: MATERIA PERICOLOSA PER L'AMBIENTE, SOLIDA N.A.S. (Borato di Zinco)
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc Borate).

14.3 Transport hazard classes

ADR/RID: Class: 9 Label: 9

IMDG: Class: 9 Label: 9

IATA: Class: 9 Label: 9

14.4 Packaging group

ADR/RID, IMDG, IATA: III

14.5 Environmental hazards

ADR/RID:	Environmental hazards	
IMDG:	Marine Pollutant	
IATA:	Environmental hazards	

14.6 Special precautions for user

ADR/RID:	HIN – Kemler: 90 General provision: --	Limited Quantity: 5kg	Tunnel restrictions: (-)
IMGD:	EMS: F-A, S-F	Limited Quantity: 5kg	
IATA:	Cargo:	Limited Quantity: 400kg	Packaging Instruction: 956
	Pass:	Limited Quantity: 400kg	Packaging Instruction: 956
	General provision:	A97, A158, A179, A197, A215	

14.7 Transport in bulk according to IMO instruments

Not regulated.

15 REGULATORY INFORMATIONS

15.1 Legislative and regulatory provisions on health, safety and environment specific to the substance or mixture

Federal US Regulation

TSCA

All components of this product are listed on the Toxic Substances Control Act (TSCA) inventory.

Clean Air Act Section 112(b)

No components listed.

Clean Air Act Section 602 Class I Substances

No components listed.

Clean Air Act Section 602 Class II Substances

No components listed.

Clean Water Act – Priority Pollutants

No components listed.

Clean Water Act – Toxic Pollutants

No components listed.

DEA List I Chemicals (Precursor Chemicals)

No components listed.

DEA List II Chemicals (Precursor Chemicals)

No components listed.

EPA List of Lists

No components listed.

EPCRA 302 EHS TPQ

No components listed.

EPCRA 304 EHS RQ

No components listed.

CERCLA RQ

No components listed.

EPCRA 313 TRI

No components listed.

RCRA Code

No components listed.

CAA 112 (r) RMP TQ

No components listed.

Local Regulation

Massachusetts

No components listed.

Minnesota

No components listed.

New Jersey

No components listed.

New York

No components listed.

Pennsylvania

No components listed.

California

No components listed.

Proposition 65

This product does not contain any substances known to the State of California to cause cancer, reproductive damage, or birth defects.

International Regulation

Substances subject to the export notification obligation Reg. (EC) 649/2012

None.

Substances subject to the Rotterdam Convention

None.

Substances subject to the Stoccolma Convention

None.

16 OTHER INFORMATIONS

Text of hazard (H) indications mentioned in sections 2-3 of the sheet.

- H341: Suspected of causing genetic defects
- H361: May damage fertility or the unborn child
- H319: Causes serious eye irritation.
- H400: Very toxic to aquatic life
- H411: Toxic to aquatic life with long-lasting effects.

Revision details

All changes to this SDS have been written in italics.

LEGEND

- 313 CATEGORY CODE: Emergency Planning and Community Right-to Know Act Section 313 Category Code
- ADR: European Agreement for the Transport of Dangerous Goods by Road
- CAA 112® RMP TQ: Risk Management Plan Threshold Quantity (Clean Air Act Section 112®)
- CAS NUMEBR: Chemicals Abstract Number
- CE50: Concentration that affects 50% of the test population
- CERCLA RQ: Reportable Quantity (Comprehensive Environment Response, Compensation, and Liability Act)
- CLP: 1272/2008 EC Regulation
- DEA: Drug Enforcement Administration
- EmS: Emergency Schedule
- EPA: US Environmental Protection Agency
- EPCRA: Emergency Planning and Community Right-to Know Act
- EPCRA 302 EHS TPQ: Extremely Hazardous Substance Threshold Planning Quantity (Section 302 Category Code)
- EPCRA 304 EHS RQ: Extremely Hazardous Substance Reportable Quantity (Section 304 Category Code)
- EPCRA 313 TRI: Toxic Realize Inventory (Section 313 Category Code)
- GHS: Globally Harmonized System for classification and labelling
- IATA DGR: Regulations for the transport of dangerous goods of the International Air Transport Associations
- IC50: Concentration of immobilization of 50% in the population subject to testing
- IMDG: International maritime code for the transport of dangerous goods
- IMO: International Maritime Organization
- LC50: 50% lethal concentration
- LD50: 50% lethal dose
- OEL: level of occupational exposure
- PEL: Predictable level of exposure
- RCRA Code: Resource Conservation and Recovery Act Code
- REL: Recommended exposition limit
- RID: Regulations for the international transport of dangerous goods by train
- STA: Acute Toxicity Estimate
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that must not be exceeded during any time of occupational exposure
- TSCA: Toxic Substances Control Act
- TWA: Weighted average exposure limit
- TWA STEL: Short term exposure limit
- VOC: Volatile organic compound
- WHMIS: Workplace Hazardous Materials Information System
- N.D.: Not Determinated
- N.A.: Not Applicable
- BW (or bw): Body Weigth

BIBLIOGRAPHY

- GHS rev. 3
- The Merck Index Ed. 10
- Handling Chemical Safety
- Niosh – Registry of Toxic Effects of Chemical Substances
- INRS – Fiche Toxicologique
- Patty – Industrial Hygiene and Toxicology
- N. I. Sax – Dangerous properties of Industrial Materials – 7 Ed., 1989
- Web site ECHA Agency
- Banca dati dei modelli di SDS di sostanze chimiche – Ministero della Salute e Istituto Superiore di Sanità

- 6 NYCRR part 597
- Cal/OSHA website
- California Safe Drinking Water and Toxic Enforcement Act
- EPA website
- Hazard Communication Standard (HCS 20129
- IARC website
- List of Lists EPA: Consolidated List of Chemical Subject to EPCRA, CERCLA and Section 112® of the Clean Air Act
- Massachusetts 105 CMR Department of public health 670.000: “Right to Know”
- Minnesota Chapter 5206 Department of Labour and Industry Hazardous Substances, Employee “Right to Know”
- New Jersey Worker Community Right to Know Act N.J.S.A.
- NTP.2011.Report of Carcinogens, 12th Edition
- OSHA website
- Pennsylvania, Hazardous Substances List, Chapter 323.

Method of calculating the classification

The classification of the product has been derived from the established criteria of OSHA Hazard Communication standard (HCS) (29 CFR 1910.1200), unless otherwise indicated in sections 11 and 12.

The methods for assessing the physical properties are reported in section 9.

Precautionary Phrases:

KEEP OUT OF REACH OF CHILDREN.

Do not ingest. Not for use in food, drugs, or pesticides.

Refer to safety data sheet.

All information on this SAFETY DATA SHEET is, to the best of our knowledge, correct, but should not be considered exhaustive. It is the user's responsibility to adopt and apply this data as appropriate. SCL Italia SpA assumes no responsibility for damages to persons or goods resulting from the incorrect handling of this product.