

## Safety data sheet

### SECTION 1. Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product name **Soldering Powder**  
Code: **S103 AG**

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

Intended use **Product for welding of metals and precious metals. For professional use only**  
Uses advised against **Uses other than those stated.**

#### 1.3. Details of the supplier of the safety data sheet

Name **GALLORINI ALLOYS SRL**  
Full address **Via la Casella n. 2/c**  
District and Country **52010 Capolona (AR)**  
**ITALY**  
Tel. **+39 0575 421147**  
Fax **+39 0575 422987**

e-mail address of the competent person

responsible for the Safety Data Sheet

**Carlo Gallorini info@gallorini.it**

#### 1.4. Emergency telephone number

For urgent inquiries refer to

**For health care identify, if applicable, the relevant phone number based on the State where you plan to deploy the product. The numbers and conditions can be found at: <http://echa.europa.eu/web/guest/support/helpdesks/national-helpdesks/list-of-national-helpdesks>**

**GALLORINI SNC di Carlo e Luca Gallorini & c.**

**Tel. +39 0575 421147** (Technical support - Monday to Friday: 8:30 to 13:00, 14:00 to 17:00)

### SECTION 2. Hazards identification

#### 2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP) (and subsequent amendments and supplements). The product thus requires a safety datasheet that complies with the provisions of EC Regulation 1907/2006 and subsequent amendments. Any additional information concerning the risks for health and/or the environment are given in sections 11 and 12 of this sheet.

Hazard classification and indication:

Reproductive toxicity, category 1B	H360Df	May damage the unborn child. Suspected of damaging fertility.
Hazardous to the aquatic environment, acute toxicity, category 1	H400	Very toxic to aquatic life.
Hazardous to the aquatic environment, chronic toxicity, category 1	H410	Very toxic to aquatic life with long lasting effects.

#### 2.2. Label elements

Hazard labelling pursuant to EC Regulation 1272/2008 (CLP) and subsequent amendments and supplements.

Hazard pictograms:



Signal words:

**Danger**

Hazard statements:

<b>H360Df</b>	May damage the unborn child. Suspected of damaging fertility.
<b>H410</b>	Very toxic to aquatic life with long lasting effects.

**S103 AG**

Restricted to professional users.

Precautionary statements:

**P201** Obtain special instructions before use.  
**P273** Avoid release to the environment.  
**P280** Wear protective gloves / clothing and eye / face protection.  
**P308+P313** IF exposed or concerned: Get medical advice / attention.  
**P391** Collect spillage.

**Contains:** DISODIUM OCTABORATE TETRAHYDRATE

### 2.3. Other hazards

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

## SECTION 3. Composition/information on ingredients

### 3.1. Substances

Information not relevant

### 3.2. Mixtures

Contains:

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

#### Identification

#### Classification 1272/2008 (CLP)

#### ZINC POWDER (stabilized)

CAS 7440-66-6  $81 \leq x < 90$  Aquatic Acute 1 H400 M=1, Aquatic Chronic 1 H410 M=1  
 EC 231-175-3  
 INDEX 030-001-01-9  
 Reg. no. 01-2119467174-37-XXXX

#### BORIC ACID

CAS 10043-35-3  $2,0 \leq x < 3,5$  Repr. 1B H360FD  
 EC 233-139-2  
 INDEX 005-007-00-2  
 Reg. no. 01-2119486683-25-0027

#### DISODIUM OCTABORATE TETRAHYDRATE

CAS 12280-03-4  $1,5 \leq x < 4,0$  Repr. 1B H360Df  
 EC 234-541-0  
 INDEX 005-020-00-3  
 Reg. no. 01-2119490860-33-0003

#### COPPER POWDER

CAS 7440-50-8  $3,5 \leq x < 6$  Aquatic Acute 1 H400 M=1, Aquatic Chronic 3 H412  
 EC 231-159-6  
 INDEX -  
 Reg. no. 01 - 2119480154 - 42 - 0000

#### RED PHOSPHORUS

CAS -  $1,0 \leq x < 3,0$  Flam. Sol. 1 H228, Aquatic Chronic 3 H412  
 EC 918-594-3  
 INDEX -

## S103 AG

Reg. no. 01-2119489913-23-0001

**SILVER POWDER, (< 1 mm)**

CAS 7440-22-4

2 ≤ x &lt; 2,5

Aquatic Acute 1 H400 M=10, Aquatic Chronic 1 H410 M=10

EC 231-131-3

INDEX -

Reg. no. 01-2119555669-21-0040

**SECTION 4. First aid measures****4.1. Description of first aid measures**

**EYES:** Remove contact lenses, if present. Wash immediately with plenty of water for at least 15 minutes, opening the eyelids fully. If problem persists, seek medical advice.

**SKIN:** Remove contaminated clothing. Wash immediately with plenty of water. If irritation persists, get medical advice/attention. Wash contaminated clothing before using it again.

**RED PHOSPHORUS**

In case of contact with skin, clean with soap and water..

**INHALATION:** Remove to open air. In the event of breathing difficulties, get medical advice/attention immediately.

**COPPER POWDER**

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**INGESTION:** Get medical advice/attention. Induce vomiting only if indicated by the doctor. Never give anything by mouth to an unconscious person, unless authorised by a doctor.

**BORIC ACID and DISODIUM OCTABORATE TETRAHYDRATE**

Swallowing small quantities (one teaspoon) will cause no harm to healthy adults. If larger amounts are swallowed, give two glasses of water to drink and seek medical attention.

Note to physicians: Observation only is required for adult ingestion of less than 5 grams of boric acid. For ingestion in excess of 5 grams, maintain adequate kidney function and force fluids.

**ZINC POWDER (stabilized)**

Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If potentially dangerous quantities of this material have been swallowed, call a physician immediately.

**COPPER POWDER**

If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention if adverse health effects persist or are severe. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

**PROTECTIVE MEASURES FOR THE FIRST RESCUE WORKERS:** for PPE (personal protection equipment) required for first aid refer to section 8.2 of this safety data sheet.

**4.2. Most important symptoms and effects, both acute and delayed**

Specific information on symptoms and effects caused by the product are unknown.

**4.3. Indication of any immediate medical attention and special treatment needed****RED PHOSPHORUS**

In case of skin burns caused by contact with phosphorus, immediately physically remove any phosphorus adhering to the skin with water (e.g. by using a brush) and douse with a 2% copper sulphate solution.

**SECTION 5. Firefighting measures**

**S103 AG****5.1. Extinguishing media****SUITABLE EXTINGUISHING EQUIPMENT**

Use dry chemical, CO2 or sand.

**UNSUITABLE EXTINGUISHING EQUIPMENT**

Do not use water, gaseous extinguishing media or foam.

**5.2. Special hazards arising from the substance or mixture****HAZARDS CAUSED BY EXPOSURE IN THE EVENT OF FIRE**

Do not breathe combustion products. The product is combustible and, when the powder is released into the air in sufficient concentrations and in the presence of a source of ignition, it can create explosive mixtures with air. Fires may start or get worse by leakage of the solid product from the container, when it reaches high temperatures or through contact with sources of ignition.

**RED PHOSPHORUS**

In case of fires, hazardous combustion gases are formed: Phosphorus oxides (eg. phosphorus pentoxide). Phosphorus pentoxide in air forms a dense, non-transparent, corrosive mist of phosphoric acid.

**5.3. Advice for firefighters****GENERAL INFORMATION**

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health. Always wear full fire prevention gear. Collect extinguishing water to prevent it from draining into the sewer system. Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

**SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS**

Normal fire fighting clothing i.e. fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

**RED PHOSPHORUS**

Cover extinguished areas with 10% copper sulphate or sode solution. Detergents may be added to the solutions

Temperature class : T3

Fire class : A

Dust explosion class :ST2

**SECTION 6. Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures**

If there are no contraindications, spray powder with water to prevent the formation of dust.

Wear suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. These indications apply for both processing staff and those involved in emergency procedures.

**6.2. Environmental precautions**

The product must not penetrate into the sewer system or come into contact with surface water or ground water.

**6.3. Methods and material for containment and cleaning up**

Collect the leaked product and place it in containers for recovery or disposal. If the product is flammable, use explosion-proof equipment. If there are no contraindications, use jets of water to eliminate product residues.

Make sure the leakage site is well aired. Evaluate the compatibility of the container to be used, by checking section 10. Contaminated material should be disposed of in compliance with the provisions set forth in point 13.

**6.4. Reference to other sections**

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

**SECTION 7. Handling and storage****7.1. Precautions for safe handling**

## S103 AG

Keep away from heat, sparks and naked flames; do not smoke or use matches or lighters. Vapours may catch fire and an explosion may occur; vapour accumulation is therefore to be avoided by leaving windows and doors open and ensuring good cross ventilation. Without adequate ventilation, vapours may accumulate at ground level and, if ignited, catch fire even at a distance, with the danger of backfire. Avoid bunching of electrostatic charges. When performing transfer operations involving large containers, connect to an earthing system and wear antistatic footwear. In order to avoid the risk of fires and explosions, never use compressed air when handling. Open containers with caution as they may be pressurised. Do not eat, drink or smoke during use. Avoid leakage of the product into the environment.

### 7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container. Store the containers sealed, in a well ventilated place, away from direct sunlight. Store in a well ventilated place, keep far away from sources of heat, naked flames and sparks and other sources of ignition. Keep containers away from any incompatible materials, see section 10 for details.

Avoid the formation and deposition of dust. Avoid impact, friction and electro-static loading; risk of ignition! Render equipment and apparatus inert (inert gases) and earth before putting into operation. Use antistatic tools.

Keep away from strong oxidizing agents

Avoid direct exposure to the sun. Make sure there is adequate ventilation. Keep preferably at temperatures between 20 ° C and 35 ° C and to avoid temperatures below -5 ° C and above 40 ° C.

### 7.3. Specific end use(s)

No use other than specified in Section 1.2 of this safety data sheet.

## SECTION 8. Exposure controls/personal protection

### 8.1. Control parameters

Regulatory References:

DEU	Deutschland	MAK-und BAT-Werte-Liste 2012
DNK	Danmark	Graensevaerdier per stoffer og materialer
ESP	España	INSHT - Límites de exposición profesional para agentes químicos en España 2015
FRA	France	JORF n°0109 du 10 mai 2012 page 8773 texte n° 102
GBR	United Kingdom	EH40/2005 Workplace exposure limits
HUN	Magyarország	50/2011. (XII. 22.) NGM rendelet a munkahelyek kémiai biztonságáról
ITA	Italia	Decreto Legislativo 9 Aprile 2008, n.81
NLD	Nederland	Databank of the social and Economic Council of Netherlands (SER) Values, AF 2011:18
POL	Polska	ROZPORZĄDZENIE MINISTRA PRACY I POLITYKI SPOŁECZNEJ z dnia 16 grudnia 2011r
SWE	Sverige	Occupational Exposure Limit Values, AF 2011:18
EU	OEL EU	Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 91/322/EEC.
	TLV-ACGIH	ACGIH 2016

### ZINC POWDER (stabilized)

Predicted no-effect concentration - PNEC

Normal value in fresh water	0,0206	mg/l
Normal value in marine water	0,0061	mg/l
Normal value for fresh water sediment	117,8	mg/kg/d
Normal value for marine water sediment	56,5	mg/kg/d
Normal value of STP microorganisms	0,1	mg/l
Normal value for the terrestrial compartment	35,6	mg/kg/d

### Health - Derived no-effect level - DNEL / DMEL

Route of exposure	Effects on consumers			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral				0,83 mg/kg bw/d				
Inhalation				2,5 mg/m3				5 mg/m3
Skin				83 mg/kg bw/d				83 mg/kg bw/d

### BORIC ACID

#### Threshold Limit Value

Type	Country	TWA/8h	STEL/15min
------	---------	--------	------------

**GALLORINI ALLOYS SRL**

Revision nr. 1  
Dated 17/03/2017  
Printed on 20/03/2017  
Page n. 6/16

**S103 AG**

	mg/m3	ppm	mg/m3	ppm				
TLV-ACGIH	2		6		INHAL			
<b>Predicted no-effect concentration - PNEC</b>								
Normal value in fresh water			2,9		mg/l			
Normal value in marine water			2,9		mg/l			
Normal value of STP microorganisms			10		mg/l			
Normal value for the terrestrial compartment			5,7		mg/kg/d			
<b>Health - Derived no-effect level - DNEL / DMEL</b>								
Route of exposure	Effects on consumers Acute local	Acute systemic	Chronic local	Chronic systemic	Effects on workers Acute local	Acute systemic	Chronic local	Chronic systemic
Oral				0,98 mg/kg bw/d				
Inhalation				4,15 mg/m3				8,3 mg/m3
Skin				196 mg/kg bw/d				392 mg/kg bw/d

**RED PHOSPHORUS**

<b>Predicted no-effect concentration - PNEC</b>								
Normal value in fresh water				0,0105				mg/l
Normal value in marine water				0,00105				mg/l
Normal value for fresh water sediment				100				mg/kg/d
Normal value for marine water sediment				10				mg/kg/d
Normal value of STP microorganisms				10				mg/l
Normal value for the terrestrial compartment				12,5				mg/kg/d
<b>Health - Derived no-effect level - DNEL / DMEL</b>								
Route of exposure	Effects on consumers Acute local	Acute systemic	Chronic local	Chronic systemic	Effects on workers Acute local	Acute systemic	Chronic local	Chronic systemic
Oral				30 mg/kg bw/d				
Inhalation				4 mg/m3				4 mg/m3
Skin				30 mg/kg bw/d				30 mg/kg bw/d

**COPPER POWDER**

<b>Threshold Limit Value</b>								
Type	Country	TWA/8h	ppm	STEL/15min	ppm			
		mg/m3		mg/m3				
MAK	DEU	0,01		0,02		RESP		
TLV	DNK	1		2				
VLA	ESP	1						
VLEP	FRA	1		2				
WEL	GBR	1		2				
AK	HUN	1		4				
MAC	NLD	0,1				INHAL		
NDS	POL	1		2				
MAK	SWE	1						
TLV-ACGIH		1						
<b>Predicted no-effect concentration - PNEC</b>								
Normal value in fresh water				0,0078				mg/l
Normal value in marine water				0,0052				mg/l
Normal value for fresh water sediment				87				mg/kg/d
Normal value for marine water sediment				676				mg/kg/d
Normal value of STP microorganisms				0,23				mg/l
Normal value for the terrestrial compartment				65				mg/kg/d
<b>Health - Derived no-effect level - DNEL / DMEL</b>								
Route of exposure	Effects on consumers Acute local	Acute systemic	Chronic local	Chronic systemic	Effects on workers Acute local	Acute systemic	Chronic local	Chronic systemic

## S103 AG

Inhalation	1 mg/m3	20 mg/m3	1 mg/m3	1 mg/m3	20 mg/m3	1 mg/m3
Skin		273 mg/kg bw/d		137 mg/kg bw/d	273 mg/kg bw/d	137 mg/kg bw/d

**SILVER POWDER, (< 1 mm)****Threshold Limit Value**

Type	Country	TWA/8h		STEL/15min	
		mg/m3	ppm	mg/m3	ppm
WEL	GBR	0,1			
VLEP	ITA	0,1			
OEL	EU	0,1			
TLV-ACGIH		0,1			

**Predicted no-effect concentration - PNEC**

Normal value in fresh water	4	mg/l
Normal value in marine water	0,00086	mg/l
Normal value for fresh water sediment	438,13	mg/kg/d
Normal value for marine water sediment	438,13	mg/kg/d
Normal value of STP microorganisms	0,025	mg/l
Normal value for the terrestrial compartment	1,41	mg/kg/d

**Health - Derived no-effect level - DNEL / DMEL**

Route of exposure	Effects on consumers			Effects on workers				
	Acute local	Acute systemic	Chronic local	Chronic systemic	Acute local	Acute systemic	Chronic local	Chronic systemic
Oral				1,2 mg/kg bw/d				
Inhalation				0,04 mg/m3				0,1 mg/m3

**Legend:**

(C) = CEILING ; INHAL = Inhalable Fraction ; RESP = Respirable Fraction ; THORA = Thoracic Fraction.

VND = hazard identified but no DNEL/PNEC available ; NEA = no exposure expected ; NPI = no hazard identified.

During the risk assessment process, it is essential to take into consideration the ACGIH occupational exposure levels for inert particulate not otherwise classified (PNOC respirable fraction: 3 mg/m3; PNOC inhalable fraction: 10 mg/m3). For values above these limits, use a P type filter, whose class (1, 2 or 3) must be chosen according to the outcome of risk assessment.

**8.2. Exposure controls**

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well aired through effective local aspiration.

When choosing personal protective equipment, ask your chemical substance supplier for advice.

Personal protective equipment must be CE marked, showing that it complies with applicable standards.

Provide an emergency shower with face and eye wash station.

**HAND PROTECTION**

In the case of prolonged contact with the product, protect the hands with penetration-resistant work gloves (see standard EN 374).

Work glove material must be chosen according to the use process and the products that may form. Latex gloves may cause sensitivity reactions.

Recommended material: rubber, nitrile and butyls.

**SKIN PROTECTION**

Wear category I professional long-sleeved overalls and safety footwear (see Directive 89/686/EEC and standard EN ISO 20344). Wash body with soap and water after removing protective clothing.

**EYE PROTECTION**

Wear airtight protective goggles (see standard EN 166). Do not use contact lenses.

**RESPIRATORY PROTECTION**

Use a type FFP3 filtering facemask (see standard EN 149).

**ENVIRONMENTAL EXPOSURE CONTROLS**

The emissions generated by manufacturing processes, including those generated by ventilation equipment, should be checked to ensure compliance with

**S103 AG**

environmental standards.

Product residues must not be indiscriminately disposed of with waste water or by dumping in waterways.

For more information refer to the exposure scenarios available on request:

- ZINC POWDER (stabilized)
- BORIC ACID
- DISODIUM OCTABORATE TETRAHYDRATE
- COPPER POWDER
- RED PHOSPHORUS
- SILVER POWDER

## SECTION 9. Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Appearance	powder
Colour	Grey
Odour	odourless
Odour threshold	Not available
pH	Not available
Melting point / freezing point	Not available
Initial boiling point	Not applicable
Boiling range	Not available
Flash point	Not applicable
Evaporation Rate	Not available
Flammability of solids and gases	Solid no-flammable (Reg. CE 440/2008, Metodo A.10 – Report n° 01652-17 , 15/03/2017)
Lower inflammability limit	Not available
Upper inflammability limit	Not available
Lower explosive limit	Not available
Upper explosive limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	7,14 g/cm <sup>3</sup>
Solubility	Not available
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity	Not available
Explosive properties	Not available
Oxidising properties	Not available

### 9.2. Other information

Information not available

## SECTION 10. Stability and reactivity

### 10.1. Reactivity

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

COPPER POWDER: In reaction with H-equivalent release of soluble copper compounds

### 10.2. Chemical stability

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

BORIC ACID: Decomposes at 100 ° C forming metaboric acid (HBO<sub>2</sub>) that, if further heated, is converted to boron oxide (B<sub>2</sub>O<sub>3</sub>)

ZINC POWDER (stabilized): Thermal decomposition can occur above 650 ° C



**S103 AG**

RED PHOSPHORUS: Thermal decomposition : 300 °C

**10.3. Possibility of hazardous reactions**

The powders are potentially explosive when mixed with air.

ZINC POWDER (stabilized): Extremely flammable hydrogen is released in reaction with acids or bases

BORIC ACID: risk of explosion on contact with acetic anhydride.

RED PHOSPHORUS: Risk of dust explosions. Reactions with peroxides. Explosive reactions with oxidising agents such as potassium chlorate and/or peroxides. At high temperatures small amounts of hydrogen phosphide are formed with water

SILVER POWDER, (< 1 mm): Dangerous reactions may form with acetylene in an explosive silveracetylide

**10.4. Conditions to avoid**

Avoid environmental dust build-up.

BORIC ACID: Avoid exposure to moisture, high temperatures and direct contact with fire and heat sources.

RED PHOSPHORUS: sparks, thermal decomposition, ignition, shock, friction

COPPER POWDER: Avoid contact with acids.

**10.5. Incompatible materials**

ZINC POWDER (stabilized):

Acids, bases, hydrocarbons, halogens, oxidisers, sulphur, carbon disulfide, hydroxylamine, hydrazine and derivatives, ammonium compounds, azides, benzene and derivatives, mercaptans, performic acid, water.

BORIC ACID:

strong reducing agents, such as metal or alkali metal hydrides. The boric acid reacts as a weak acid which can cause corrosion of metal of a basic nature.

RED PHOSPHORUS: oxidants

COPPER POWDER: Strong acids concentrated

SILVER POWDER, (< 1 mm): Acetylene, Ammonia, nitric acid

**10.6. Hazardous decomposition products**

ZINC POWDER (stabilized): Hazardous decomposition products. Thermal decomposition can occur above 650 ° C

RED PHOSPHORUS: Hazardous decomposition products like Hydrogen phosphide and White/yellow phosphorus

**SECTION 11. Toxicological information**

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification.

It is therefore necessary to take into account the concentration of the individual hazardous substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

**11.1. Information on toxicological effects****ACUTE TOXICITY**

LC50 (Inhalation - vapours) of the mixture: LC50 (Inhalation - vapours) of the mixture:

**S103 AG**

Not classified (no significant component)

LC50 (Inhalation - mists / powders) of the mixture:LC50 (Inhalation - mists / powders) of the mixture:

Not classified (no significant component)

LD50 (Oral) of the mixture:LD50 (Oral) of the mixture:

Not classified (no significant component)

LD50 (Dermal) of the mixture:LD50 (Dermal) of the mixture:

Not classified (no significant component)

**BORIC ACID**

LD50 (Oral)> 2660 mg/kg Rat (OECD TG 401)

LD50 (Dermal)> 2000 mg/kg Rabbit (FIFRA (40 CFR 163))

LC50 (Inhalation)> 2,03 mg/l/4h Rat/aerosol (OECD TG 403)

**SILVER POWDER, (< 1 mm)**

LD50 (Oral) > 2000 mg/kg Rat (OECD Guideline 423)

LD50 (Dermal)> 2000 mg/kg Rat (OECD Guideline 402)

LC50 (Inhalation) 5,16 mg/l/4h Rat/dust (OECD Guideline 436)

**ZINC POWDER (stabilized)**

LD50 (Oral) > 2000 mg/kg Rat (OECD Guideline 401, in GLP)

LC50 (Inhalation)> 5,41 mg/l/4h Rat/dust (OECD Guideline 403)

**COPPER POWDER**

LD50 (Oral) > 2500 mg/kg Rat (OECD Guideline 423)

LD50 (Dermal) > 2000 mg/kg Rat (OECD Guideline 402)

LC50 (Inhalation) > 5,11 mg/l/4h Rat/dust (OECD Guideline 436)

**RED PHOSPHORUS**

LD50 (Oral) > 15000 mg/kg Rat (OECD Guideline 401)

**SKIN CORROSION / IRRITATION**

Does not meet the classification criteria for this hazard class

**SERIOUS EYE DAMAGE / IRRITATION**

Does not meet the classification criteria for this hazard class

**RESPIRATORY OR SKIN SENSITISATION**

Does not meet the classification criteria for this hazard class

**GERM CELL MUTAGENICITY**

Does not meet the classification criteria for this hazard class

**CARCINOGENICITY**

Does not meet the classification criteria for this hazard class

**REPRODUCTIVE TOXICITY**

May damage the unborn child - Suspected of damaging fertilityMay damage the unborn child - Suspected of damaging fertility

**BORIC ACID**

*Adverse effects on sexual function and fertility*

Method: three-generation study (similar to OECD 416)

Species: rat

Doses: 0, 34 (5.9), 100 (17.5) and 336 (58.5) mg boric acid (mg B)/kg bw/day

Route of administration: oral feed

Results: NOAEL (male) : 100 mg/kg bw boric acid equivalent to 17.5 mg B/kg bw

*Adverse effects on development of the offspring*

Method: OECD Guideline 414 (Prenatal Developmental Toxicity Study)

Species: rat

Doses:19 (3.3), 36 (6.3), 55(9.6), 76 (13.3) and 143 (25) mg boric acid (mg B)/kg bw

Route of administration: oral feed

Results: NOAEL : 55 mg/kg bw/day or 9.6 mg/kg bw/day (a reduction in the mean foetal bodyweight per litter and skeletal changes)

**S103 AG**DISODIUM OCTABORATE TETRAHYDRATE (Source: SDS supplier)

Studies on the administration at high doses in rats, mice and dogs have shown adverse hematologic effects and the primary target organ of toxicity of boron are the testicles. At high doses in rats, mice and rabbits have shown effects on the developing fetus, including fetal weight loss and minor skeletal variations studies. The doses administered were much higher than those which are normally exposed humans.

The tests of exposure to 50 and 155 mg Borax decahydrate / kg body weight (equivalent to 5.9 and 17.5 mg B / kg body weight) made on 3 generations of Sprague-Dawley rats showed no adverse effects on fertility, lactation, litter size, weight of the unborn or other abnormalities. NOAEL (No Observed Adverse Effect Level) for fertility (male rat): 17.5 mg B / kg / day.

The rats exposed to doses of 518 mg Borax decahydrate / kg body weight (equivalent to 58.5 mg B / kg body weight) were sterile.

The examination of the ovaries in female rats exposed to 58.5 mg B / kg body weight has detected ovulation decreased in most of the examined ovaries. None of the females exposed to high doses has generated puppies after mating with males in the control group.

LOAEL (Lowest Observed Adverse Effect Level) for fertility (female / male rat): 58.5 mg B / kg body weight / day.

The group of male rats and high-dose females (58.5 mg B / kg body weight) showed clinical signs of toxicity such as sleeping rough, scaly tail, respiratory distress and inflamed eyelids.

Based on the data obtained from this study it concluded that exposure of rats at levels up to 17.5 mg B / kg body weight does not cause adverse reproductive effects.

Population studies of humans with a high exposure to boron, did not show any adverse effect on the developing fetus.

STOT - SINGLE EXPOSURE

Does not meet the classification criteria for this hazard class

STOT - REPEATED EXPOSURE

Does not meet the classification criteria for this hazard class

ASPIRATION HAZARD

Does not meet the classification criteria for this hazard class

**SECTION 12. Ecological information**

This product is dangerous for the environment and highly toxic for aquatic organisms. In the long term, it have negative effects on aquatic environment.

**12.1. Toxicity**BORIC ACID

LC50 - for Fish	79,7 mg/l/96h Pimephales promelas (ASTM E729-95)
EC50 - for Crustacea	109 mg/l/48h Ceriodaphnia dubia (ASTM E729-95)
EC50 - for Algae / Aquatic Plants	40,2 mg/l/72h Pseudokirchneriella subcapitata (OECD Guideline 201)
Chronic NOEC for Fish	< 44,5 mg/l/ 32 d Pimephales promelas (ASTM E1241-05)
Chronic NOEC for Crustacea	10,8 mg/l/21 d Daphnia magna (OECD Guideline 211)
Chronic NOEC for Algae / Aquatic Plants	17,5 mg/l/72h Pseudokirchneriella subcapitata (OECD Guideline 201)

SILVER POWDER, (< 1 mm)

LC50 - for Fish	0,011 mg/l/96h Specie: Oncorhynchus kisutchinnet. guida : ASTM 1998, fonte: Buhl KJ, Hamilton SJ 1991
EC50 - for Crustacea	0,002 mg/l/48h Specie: Daphnia magna. (OECD Guideline 202) (Source: Asghari S, Johari SA, Lee JH, Kim YS 2012)
LC10 for Fish	0,00019 mg/l/217d specie: Salmo trutta (OECD Guideline 210)
EC10 for Crustacea	0,00214 mg/l/21d Specie: Daphnia magna. Guideline: ASTM standard
Chronic NOEC for Crustacea	0,019 mg/l/28 giorni Americamysis bahia (ASTM E1191-97 (2003) )

ZINC POWDER (stabilized)

LC50 - for Fish	0,112 mg/l/96h Thymallus arcticus (pH= 7-8; ASTM, E-729-88)
EC50 - for Crustacea	0,131 mg/l/48h Daphnia magna (method equivalent or similar to OECD Guideline 202, in GLP)
EC50 - for Algae / Aquatic Plants	0,136 mg/l/72h Pseudokirchneriella subcapitata (OECD TG 201)
Chronic NOEC for Fish	0,039 mg/l/30 d Oncorhynchus mykiss (OECD Guideline 215)
Chronic NOEC for Crustacea	0,042 mg/l 21d Daphnia magna (method equivalent or similar to EPA OPPTS 850.1300)
Chronic NOEC for Algae / Aquatic Plants	0,027 mg/l/72h Pseudokirchneriella subcapitata (OECD Guideline 201)

COPPER POWDER

**S103 AG**

LC50 - for Fish	0,172 mg/l/96h Pimephales promelas (Read across with CAS 7758-98-7; no guideline followed)
EC50 - for Crustacea	0,338 mg/l/48h Daphnia magna (weight of evidence; OECD Guideline 202)
EC50 - for Algae / Aquatic Plants	0,06 mg/l/72h (Read across with EC 231-210-2; OECD Guideline 201)
Chronic NOEC for Fish	0,061 mg/l/28d Pimephales promelas (weight of evidence, method equivalent or similar to OECD Guideline 210 )

**12.2. Persistence and degradability**BORIC ACID

Solubility in water	a 20°C (EU Method A.6) mg/l
Partition coefficient: n-octanol/water	-1,09 Log Kow a 22°C (EU Method A.8)

**12.3. Bioaccumulative potential**BORIC ACID

Boron accumulates in terrestrial and aquatic plants. The BSAF values (A Biota / Sediment Accumulation Factor) derived from tests on the soil are generally <100.

**12.4. Mobility in soil**BORIC ACID

Boric acid is soluble in water and is dispersed through the ground.

COPPER POWDER

The copper ions bind strongly to the soil matrix. The binding depends on the properties of the soil. The average value of the water-soil partition coefficient (Kp) is obtained: 2120 l / kg.

ZINC POWDER (stabilized)

Partition coefficient: soil/water	158,5 l/kg (Source: SDS supplier)
-----------------------------------	-----------------------------------

**12.5. Results of PBT and vPvB assessment**

On the basis of available data, the product does not contain any PBT or vPvB in percentage greater than 0,1%.

**12.6. Other adverse effects**

Information not available

**SECTION 13. Disposal considerations****13.1. Waste treatment methods**

Reuse, when possible. Product residues should be considered special hazardous waste. The hazard level of waste containing this product should be evaluated according to applicable regulations.

Disposal must be performed through an authorised waste management firm, in compliance with national and local regulations.

Waste transportation may be subject to ADR restrictions.

**CONTAMINATED PACKAGING**

Contaminated packaging must be recovered or disposed of in compliance with national waste management regulations.

**SECTION 14. Transport information**

The product is not classified as a flammable solid on the basis of tests conducted according to the method A.10 of the EC Reg. 440/2008, conducted on 15.03.2017.

## S103 AG

**14.1. UN number**

ADR / RID, IMDG, IATA: 3077

ADR / RID: In accordance with Special Provision 375, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to ADR provisions.

IMDG: In accordance with Section 2.10.2.7 of IMDG Code, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to IMDG Code provisions.

IATA: In accordance with SP A197, this product, when is packed in receptacles of a capacity ≤ 5Kg or 5L, is not submitted to IATA dangerous goods regulations.

**14.2. UN proper shipping name**

ADR / RID: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc, Copper)

IMDG: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc, Copper)

IATA: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Zinc, Copper)

**14.3. Transport hazard class(es)**

ADR / RID: Class: 9 Label: 9

IMDG: Class: 9 Label: 9

IATA: Class: 9 Label: 9

**14.4. Packing group**

ADR / RID, IMDG, IATA: III

**14.5. Environmental hazards**

ADR / RID: Environmentally Hazardous

IMDG: Marine Pollutant

IATA: Environmentally Hazardous

**14.6. Special precautions for user**

ADR / RID:	HIN - Kemler: 90	Limited Quantities: 5 kg	Tunnel restriction code: (E)
	Special Provision: -		
IMDG:	EMS: F-A, S-F	Limited Quantities: 5 kg	
IATA:	Cargo:	Maximum quantity: 400 Kg	Packaging instructions: 956
	Pass.:	Maximum quantity: 400 Kg	Packaging instructions: 956
	Special Instructions:	A97, A158, A179, A197	

**14.7. Transport in bulk according to Annex II of Marpol and the IBC Code**

Information not relevant

**SECTION 15. Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

Seveso Category - Directive 2012/18/EC: E1 - ENVIRONMENTAL HAZARDS - Acute 1 or Chronic 1

Restrictions relating to the product or contained substances pursuant to Annex XVII to EC Regulation 1907/2006Contained substance

Point 30

**BORIC ACID Reg. no.: 01-2119486683-25-0027**

30. Substances which appear in Part 3 of Annex VI to Regulation (EC) No 1272/2008 classified as toxic to reproduction category 1A or 1B (Table 3.1) or toxic to reproduction category 1 or 2 (Table 3.2) and listed as follows: — Reproductive toxicant category 1A adverse effects on sexual function and fertility or on development (Table 3.1) or reproductive toxicant category 1 with R60 (May impair fertility) or R61 (May cause harm to the unborn child) (Table 3.2) listed in Appendix 5 — Reproductive toxicant category 1B adverse effects on sexual function and fertility or on development (Table 3.1) or reproductive toxicant category 2 with R60 (May impair fertility) or R61 (May cause harm to the unborn child) (Table 3.2) listed in Appendix 6

Without prejudice to the other parts of this Annex the following shall apply to entries 28 to 30:

1. Shall not be placed on the market, or used,
  - as substances,
  - as constituents of other substances, or,
  - in mixtures,

for supply to the general public when the individual concentration in the substance or mixture is equal to or greater than:

- either the relevant specific concentration limit specified in Part 3 of Annex VI to Regulation (EC) No 1272/2008, or,
- the relevant generic concentration limit specified in Part 3 of Annex I of Regulation (EC) No 1272/2008.

Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of substances and mixtures, suppliers shall ensure before the placing on the market that the packaging of such substances and mixtures is marked visibly, legibly and indelibly as follows: '*Restricted to professional users*'.

2. By way of derogation, paragraph 1 shall not apply to:
  - (a) medicinal or veterinary products as defined by Directive 2001/82/EC and Directive 2001/83/EC;
  - (b) cosmetic products as defined by Directive 76/768/EEC;
  - (c) the following fuels and oil products:
    - motor fuels which are covered by Directive 98/70/EC,
    - mineral oil products intended for use as fuel in mobile or fixed combustion plants,
    - fuels sold in closed systems (e.g. liquid gas bottles);
  - (d) artists' paints covered by Regulation (EC) No 1272/2008;
  - (e) the substances listed in Appendix 11, column 1, for the applications or uses listed in Appendix 11, column 2. Where a date is specified in column 2 of Appendix 11, the derogation shall apply until the said date.

Substances in Candidate List (Art. 59 REACH)**BORIC ACID** (Reg. no.: 01-2119486683-25-0027)Substances subject to authorisation (Annex XIV REACH)

None

Substances subject to exportation reporting pursuant to (EC) Reg. 649/2012:

None

Substances subject to the Rotterdam Convention:

None

Substances subject to the Stockholm Convention:

None

Healthcare controls

Workers exposed to this chemical agent must not undergo health checks, provided that available risk-assessment data prove that the risks related to the workers' health and safety are modest and that the 98/24/EC directive is respected.

**15.2. Chemical safety assessment**

A chemical safety assessment has been performed for the following contained substances:

- ZINC POWDER (stabilized)
- BORIC ACID
- DISODIUM OCTABORATE TETRAHYDRATE

## S103 AG

- COPPER POWDER
- RED PHOSPHORUS
- SILVER POWDER

## SECTION 16. Other information

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

<b>Flam. Sol. 1</b>	Flammable solid, category 1
<b>Repr. 1B</b>	Reproductive toxicity, category 1B
<b>Aquatic Acute 1</b>	Hazardous to the aquatic environment, acute toxicity, category 1
<b>Aquatic Chronic 1</b>	Hazardous to the aquatic environment, chronic toxicity, category 1
<b>Aquatic Chronic 3</b>	Hazardous to the aquatic environment, chronic toxicity, category 3
<b>H228</b>	Flammable solid.
<b>H360Df</b>	May damage the unborn child. Suspected of damaging fertility.
<b>H360FD</b>	May damage fertility. May damage the unborn child.
<b>H400</b>	Very toxic to aquatic life.
<b>H410</b>	Very toxic to aquatic life with long lasting effects.
<b>H412</b>	Harmful to aquatic life with long lasting effects.

## LEGEND:

- ADR: European Agreement concerning the carriage of Dangerous goods by Road
- CAS NUMBER: Chemical Abstract Service Number
- CE50: Effective concentration (required to induce a 50% effect)
- CE NUMBER: Identifier in ESIS (European archive of existing substances)
- CLP: EC Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System of classification and labeling of chemicals
- IATA DGR: International Air Transport Association Dangerous Goods Regulation
- IC50: Immobilization Concentration 50%
- IMDG: International Maritime Code for dangerous goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identifier in Annex VI of CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal dose 50%
- OEL: Occupational Exposure Level
- PBT: Persistent bioaccumulative and toxic as REACH Regulation
- PEC: Predicted environmental Concentration
- PEL: Predicted exposure level
- PNEC: Predicted no effect concentration
- REACH: EC Regulation 1907/2006
- RID: Regulation concerning the international transport of dangerous goods by train
- TLV: Threshold Limit Value
- TLV CEILING: Concentration that should not be exceeded during any time of occupational exposure.
- TWA STEL: Short-term exposure limit
- TWA: Time-weighted average exposure limit
- VOC: Volatile organic Compounds
- vPvB: Very Persistent and very Bioaccumulative as for REACH Regulation
- WGK: Water hazard classes (German).

**Classification according to Regulation (EC) Nr. 1272/2008**

Reproductive toxicity, category 1B, H360Df - May damage the unborn child.  
 Suspected of damaging fertility.  
 Hazardous to the aquatic environment, acute toxicity, category 1, H400 - Very toxic to aquatic life.  
 Hazardous to the aquatic environment, chronic toxicity, category 1, H410 - Very toxic to aquatic life with long lasting effects.

**Classification procedure**

Calculation method.  
 Calculation method.  
 Calculation method.

**GENERAL BIBLIOGRAPHY**

1. Regulation (EU) 1907/2006 (REACH) of the European Parliament
  2. Regulation (EC) 1272/2008 (CLP) of the European Parliament
  3. Regulation (EU) 790/2009 (I Atp. CLP) of the European Parliament
  4. Regulation (EU) 2015/830 of the European Parliament
  5. Regulation (EU) 286/2011 (II Atp. CLP) of the European Parliament
  6. Regulation (EU) 618/2012 (III Atp. CLP) of the European Parliament
  7. Regulation (EU) 487/2013 (IV Atp. CLP) of the European Parliament
  8. Regulation (EU) 944/2013 (V Atp. CLP) of the European Parliament
  9. Regulation (EU) 605/2014 (VI Atp. CLP) of the European Parliament
  10. Regulation (EU) 2015/1221 (VII Atp. CLP) of the European Parliament
  11. Regulation (EU) 2016/918 (VIII Atp. CLP) of the European Parliament
- The Merck Index. - 10th Edition
  - Handling Chemical Safety
  - INRS - Fiche Toxicologique (toxicological sheet)
  - Patty - Industrial Hygiene and Toxicology
  - N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
  - IFA GESTIS website
  - ECHA website
  - Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy

**Note for the recipient of the Safety Data Sheet (SDS):**

This SDS was authored by Flashpoint S.r.l. on the basis of:

- a) the provisions contained in EC Regulation no.1907/2006 (REACH), and in particular Article 31 and Annex II of the Regulation, and its subsequent amendments, and
- b) information provided by the "Supplier" identified in Section 1 of this SDS and in particular the data necessary to:
  - i) identify the substance (mono-constituent, multi-constituent or UVCB) or the mixture;
  - ii) describe the physical and chemical properties (Section 9),
  - iii) describe the toxicological properties (Section 11)
  - iv) describe the eco-toxicological properties (Section 12), and
  - v) appropriately characterize the other sections of the SDS.

Considering that the "data search" in scientific literature and testing for the evaluation of the properties for the substance or the mixture are under the responsibility of the Supplier, Flashpoint S.r.l. assumes no responsibility concerning reliability and completeness of the information referred to the above mentioned point b) in authoring this SDS.

The recipient of this SDS shall make sure of reading and understanding the information included by all people who handle, store, use, or otherwise come into contact in any way with the substance or mixture to which this SDS is referred to. In particular, the recipient shall provide adequate training to the personnel for the use of hazardous substances and/or mixtures. The recipient shall verify the suitability and completeness of the provided information according to the specific use of the substance or mixture.

However, the substance or mixture referred to by this SDS shall not be used for uses other than those specified in Section 1. The Supplier don't assume responsibility for improper uses. Since the use of the product does not fall under the direct control of the Supplier, the user shall, under his own responsibility, fulfill national and EU regulations concerning health and safety.

The information included in this SDS are provided in good faith and are based on the current state of scientific and technical knowledge, at the revision date indicated, available to the Supplier indicated in Section 1 of this SDS. It shall not be meant that the SDS is a guarantee of any specific property of the substance or mixture. The information concern only to the substance or mixture specifically designated in Section 1 and it could not be valid for the substance or mixture used in combination with other materials or in any process not specified in the text.

This version of the SDS substitutes all the previous versions.