MATERIAL SAFETY DATA SHEET

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

1.1. Identification of the substance/product

Code: **RX220 (80190091 90 ml / 80199090 500 ml)**
Product name: **ORP (REDOX) SOLUTION 220 mV @ 25 °C**

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

Description/Use: Reagent for laboratory and process control.

1.3. Details of the supplier of the safety data sheet

Manufacturer/Supplier: STEIEL Elettronica Srl
Street Address/P.O. Box: Viale Europa, 24
Country IC/Postcode/Place: 35020 PONTE SAN NICOLO' (PD) - ITALY
Tel. +39.049.8961488

1.4. Emergency contacts (Italy)

For info contact: Poison control centres (24/24h):
Pavia +39.0382.24444; Milan +39.02.66101029; Bergamo +39.800883300;
Florence +369.055.7947819;
Rome - Gemelli +39.06.3054343; Rome - Umberto I +39.06.49978000;
Rome - Bambino Gesù +39.06.68593726;
Naples +39.081.7472870; Foggia +39.0881.732326

SECTION 2. Hazards identifications.

2.1. Classification of the substance or mixture.

The product is not classified as dangerous according to the Regulation (EC) 1272/2008 (CLP).
However, since the product contains dangerous substances in a concentration such as to be declared in section 3, it requires a safety data sheet with adequate information, in compliance with Regulation (EU) 2015/830.

Hazard classification and indication: --

2.2. Label elements.

Hazard pictograms: --
Warnings: --
Hazard indications: **EUH210** Safety data sheet available on request.
Safety advices: --

Product not intended for the uses envisaged by Dir. 2004/42 / EC.

2.3. Other dangers.

Based on available data, the product does not contain any PBT or vPvB substances as a percentage greater than 0.1%.

SECTION 3. Compositions/information on ingredients.

3.1. Substances.

Not relevant information.

3.2. Mixtures.

Contains:

Identification	Conc. %	Classification 1272/2008 (CLP).
Mercury Iodide (44% - metallic element) CAS. 7774-29-0 CE. 231-873-8 INDEX. 080-002-00-6	< 0,1	Acute Tox. 1 H310, Acute Tox. 2 H300, Acute Tox. 2 H330, STOT RE 2 H373, Eye Dam. 1 H318, Aquatic Acute 1 H400 M=1, Aquatic Chronic 1 H410, Nota 1, A

The full text of hazard (H) phrases is given in section 16 of this document.

SECTION 4. First aid measures.

4.1. Description of the first aid measures.

There are no known episodes of damage to the personnel assigned to use the product. If necessary, take the following general measures:

- INHALATION: Take the subject out into fresh air. If breathing stops, give artificial respiration. Consult a physician immediately.
- SWALLOWING: Consult a physician immediately. Induce vomiting only on medical advice. Do not administer anything by mouth if the subject is unconscious.
- EYE and SKIN: Wash abundantly with water. In case of persistent irritation, consult a physician.

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

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

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

Information not available.

SECTION 5. Firefighting measures.

The product is not flammable and does not feed flames.

5.1. Extinguishing media.

SUITABLE EXTINGUISHING MEDIA

Extinguishing media are traditional: CO_2, foam, powder and water spray.

UNSUITABLE EXTINGUISHING MEDIA

None in particular.

5.2. Special hazards arising from the substance or mixture.

DANGERS DUE TO EXPOSURE IN CASE OF FIRE.

Avoid to breath combustion products.

5.3. Advice for fire fighters.

GENERAL INFORMATION

Cool endangered receptacles to avoid the decomposition of the product and the development of substances potentially dangerous for health. Wear always fully protective suit. Collect contaminated firefighting water separately, they must not enter into sewers. Dispose the contaminated water used for extinction and the residual of the fire according to applicable regulations.

EQUIPMENT

Normal firefighting clothing, such as open-circuit self-contained breathing apparatus (EN137), flame retardant equipment (EN469), fire resistant gloves (EN659) and boots for firefighters (HO A29 or A30).

SECTION 6. Accidental release measures.

6.1. Personal precautions, protective equipment and emergency procedures.

n case of vapours or dust dispersed in the air, adopt respiratory protection. These indications are valid both for the workers and for emergency interventions:

6.2. Environmental precautions.

Prevent product from entering the sewers, surface water and ground water.

6.3. Methods and material for containment and cleaning up.

Dike with soil or inert material. Collect as much of the resulting mass as possible (to be sent for reclamation treatment) and eliminate the remainder with jets of water.
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.

SECTION 7. Handling and storage.

7.1. Precautions for safe handling.

Handle the product after having consulted all the sections of this safety data sheet. Avoid the dispersion of the product in the environment. Do not eat, drink or smoke during use.

7.2. Conditions for safe storage, including any incompatibilities.

Store the product in clearly labelled containers. Keep storage containers away from any incompatible materials, checking section 10.

7.3. Special end uses.

Information not available.

SECTION 8. Control of personal exposure / protection.

8.1. Control parameters.

Normative reference:

ITA	Italy	Legislative Decree dated 9 April 2008, n.81
EU	OEL EU	Directive (EU) 2017/2398; Directive (EU) 2017/164; Directive 2009/161/EU; Directive 2006/15/EC; Directive 2004/37/EC; Directive 2000/39/EC; Directive 91/322/CEE.
	TLV-ACGIH	ACGIH 2017

MERCURY IODIDE							
Threshold Limit Value.							
Type	Status	TWA/8h		STEL/15min			Notes
		mg/m³	ppm	mg/m³	ppm		
VLEP	ITA	0.02				SKIN	(as Hg)
OEL	EU	0.02					(as Hg)
TLV-ACGIH		0.025				SKIN	A4, IBE

POTASSIUM IODIDE							
Threshold Limit Value.							
Type	Status	TWA/8h		STEL/15min			Note
		mg/m³	ppm	mg/m³	ppm		
TLV-ACGIH			0.01				A4; Hypothyroidsm; URT irr.
Expected concentration of no effect on the environment							
Reference value in fresh water				0.007			
Reference value for sediments in fresh water				0.007			
Reference value for the food chain (secondary poisoning)				0.3			
Reference value for the terrestrial compartment				0.0397			
Health – Derived No Effect Level – DNEL / DMEL							
	Effects on consumers				Effects on workers		
Exposure	Acute local	Acute systemic		Chronical systemic	Chronical local	Chronical systemic	
Oral		0.01 mg/kg bw/d		0.01 mg/kg bw/d			
Inhalation				0.035 mg/m3		0.07 mg/m3	
Skin				1 mg/kg bw/d		1 mg/kg bw/d	

Legenda:
(C) = CEILING ; INALAB = Inhalable fraction; RESPIR = Respirable fraction; THORAC = Thoracic fraction.
VND = identified danger but no DNEL/PNEC available; NEA = no exposure expected; NPI = no danger identified.

Sampling method: http://amcaw.ifa.dguv.de/substance/methoden/075-L-Mercury.pdf
IBE elementary mercury: 20ug/g creatine.
Mercury, inorganic and elementary forms:
Notes: Skin, A4, BEI
Critical effects: damage to the central nervous system, damage to the kidneys.

8.2. Exposure controls.

Given that the use of appropriate technical measures should always have priority over personal protection equipment, ensure good ventilation at the workplace by means of effective local air extraction.
For the choice of personal protective equipment, if necessary, seek advice from your chemical suppliers.
Personal protective equipment must bear the CE marking attesting their compliance with applicable regulations.

In the event that the product can or must come into contact or react with acids, adopt adequate technical and / or organizational measures, due to the risk of the development of toxic and / or flammable gases.

HAND PROTECTION
Protect hands with work gloves of category III, class L (ref. standard EN374).
For the definitive choice of work gloves material, consider compatibility, degradation, breaking time and permeation data.
In the case of preparations, the resistance of work gloves to chemical agents must be verified before use as unpredictable. The gloves have a wear time that depends on the duration and type of use.

SKIN PROTECTION
Wear workwear with long sleeves and safety footwear for professional use of category III (ref. Regulation 2016/425 and standard EN ISO 20344). Wash with water and soap after removing protective clothing.

EYE PROTECTION
It is advisable to wear hermetic goggles (ref. standard EN166).

RESPIRATORY PROTECTION
If the threshold value (ex. TLV-TWA) of the product is exceeded for one or more substances contained in the product, it is advisable to wear a mask with a type E filter whose class (1, 2 or 3) should be chosen in relation to the limit concentration of use. (ref. standard EN14387). If there are gases or vapours of different nature and / or gases or vapours with particles (aerosols, fumes, fogs, etc.), combined filters should be provided.
The use of respiratory protections is necessary if the technical measures taken are not sufficient to limit the exposure of the worker to the threshold values taken into account. The protection provided by masks is, however, limited.
If the substance is odourless or if its odour threshold is greater than its TLV-TWA and in case of emergency, wear an open-air compressed-air self-breathing apparatus (ref. std EN137) or external-air breathing apparatus (ref. std EN138).
For the correct choice of the respiratory protective device, refer to std EN529.

ENVIRONMENTAL EXPOSURE CONTROLS
Emissions from production processes, including those from ventilation equipment, should be checked for compliance with environmental protection regulations.

SECTION 9. Physical and chemical characteristics.

9.1. Information about the relevant physical and chemical properties.

Physical state	Liquid
Colour	Yellow
Odour	Characteristic
Odour threshold	Not available
pH	Approx. 7
Melting or freezing point	Not available
Initial boiling point	Not available
Boiling range	Not available
Flash point	Not available
Evaporation rate	Not available
Flammability of solids and gases	Not applicable
Flammability lower limit	Not applicable
Flammability upper limit	Not applicable
Explosion lower limit	Not available
Explosion upper limit	Not available
Vapour pressure	Not available
Vapour density	Not available
Relative density	Not available
Solubility	Soluble in water
Partition coefficient: n-octanol/water:	Not available
Self-ignition temperature	Not available
Decomposition temperature	Not available

Viscosity	Not available
Explosive properties	Not applicable
Oxidant properties	Not applicable

9.2. Additional information.

VOC (Directive 2010/75/CE) :	0
VOC (volatile carbon) :	0

SECTION 10. Stability and reactivity.

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

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

10.3. Possible hazardous reactions.
In normal conditions of use and store are not foreseeable dangerous reactions.

MERCURY IODIDE
Reacts with: alkali metals, halogenated compounds.

10.4. Conditions to be avoided.
None in particular. However follow the usual precautions against chemicals.

MERCURY IODIDE
Decomposes when exposed to: high temperatures.
Avoid exposure to: light.

10.5. Incompatible materials.
MERCURY IODIDE
Incompatible with: alkali metals.

10.6. Hazardous decomposition products.
MERCURY IODIDE
Hydrogen iodide, iodine, mercury oxides.

SECTION 11. Toxicological information.

11.1. Information about toxicological effects.

Metabolism, kinetic, action mechanism and other information
Information not available.

Information on possible exposures
Information not available.

Immediate, delayed and chronic effects arising from short and long-term exposures
Information not available.

Interactive effects
Information not available.

HIGH TOXICITY
LC50 (Inhalation) of mixture: Not classified (no relevant component)
LD50 (Oral) of mixture: Not classified (no relevant component)
LD50 (Skin) of mixture: Not classified (no relevant component)

SKIN CORROSION / IRRITATION
It does not meet the classification criteria for this hazard class.

SERIOUS EYE DAMAGE / SERIOUS EYE IRRITATION
It does not meet the classification criteria for this hazard class.

RESPIRATORY OR SKIN SENSIBILIZATION
It does not meet the classification criteria for this hazard class.

MUTAGENICITY ON GEMINAL CELLS
It does not meet the classification criteria for this hazard class.

CARCINOGENICITY
It does not meet the classification criteria for this hazard class.

REPRODUCTIVE TOXICITY
It does not meet the classification criteria for this hazard class.

SPECIFIC TARGET ORGAN TOXICITY (STOT) – SINGLE EXPOSURE
It does not meet the classification criteria for this hazard class.

SPECIFIC TARGET ORGAN TOXICITY (STOT) – REPEATED EXPOSURE
It does not meet the classification criteria for this hazard class.

DANGER IN CASE OF INHALATION
It does not meet the classification criteria for this hazard class.

SECTION 12. Ecological information.

12.1. Toxicity.
Information not available.

12.2. Persistence and degradability.
MERCURY IODIDE
NOT rapidly biodegradable.

12.3. Bioaccumulation potential.
Information not available.

12.4. Mobility in soil.
Information not available.

12.5. Results of the PBT and vPvB evaluation.
Based on available data, the product does not contain any PBT or vPvB substances as a percentage greater than 0.1%.

12.6. Other adverse effects.
Information not available.

SECTION 13. Disposal indication.

13.1. Waste treatment methods.
Reuse, when possible. Product residues should be considered special hazardous waste.
Disposal must be performed through an authorized waste management firm, in compliance with the national and local regulations.

CONTAMINATED PACKAGING
Contaminated packaging must be recovered or disposed of in compliance with national waste management regulation.

SECTION 14. Transport information.

14.1. ONU Number.
Not applicable.

14.2. ONU Shipping name.
Not applicable.

14.3. Transport hazard classes.
Not applicable.

14.4. Packaging group.
Not applicable.

14.5. Environmental hazards.
Not applicable.

14.6. Special precautions for users.
Not applicable.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code.
Not relevant information.

SECTION 15. Regulatory Information.

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

Seveso Category - Directive 2012/18/CE: None

Restrictions relating to the product or contained substances, according to Annex XVII Regulation (CE) 1907/2006.
Contained substances.

Point	18	Mercury iodide

Substances in Candidate List (Art. 59 REACH)
Based on available data, the product does not contain any SVHC substance as a percentage greater than 0.1%.

Substances under authorization (Annex XIV REACH).
None.

Substances subject to obligation to export notification, Reg. (CE) 649/2012:
None

Substances subject to Rotterdam Convention:
None

Substances subject to Stockholm Convention:
None

Sanitary Checks
Information not available.

15.2. Chemical Safety assessment.
A chemical safety assessment has not been developed for the mixture and the substances it contains.

SECTION 16. Other Information.

Text of hazard (H) indications mentioned in sections 2-3 of this document:

Acute Tox. 1	Acute toxicity, category 1
Acute Tox. 2	Acute toxicity, category 2
STOT RE 2	Specific Target Organ Toxicity - repeated exposure, category 2
Aquatic Acute 1	Dangerous for the aquatic environment, acute toxicity, category 1
Aquatic Chronic 1	Dangerous for the aquatic environment, chronic toxicity, category 1
H310	Fatal in contact with skin.
H300	Fatal if swallowed.
H330	Fatal if inhaled.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aqiuatic life.

H410	Very toxic to aquatic life with long lasting effects.
EUH210	Safety data sheet available on request.

LEGEND:
- ADR: European Agreement on the transport of Dangerous goods by Road
- CAS NUMBER: Identification Number of the Chemical Abstract Service
- CE50: Concentration that affects the 50% of the population subject to test
- CE NUMBER: Identification Number in ESIS (European database of existing substances)
- CLP: CE Regulation 1272/2008
- DNEL: Derived No Effect Level
- EmS: Emergency Schedule
- GHS: Globally Harmonized System for classification and labelling of chemicals
- IATA DGR: Regulation for the transport of Dangerous Goods of the International Air Transport Association
- IC50: Immobilization Concentration of the 50% of population subjected to test
- IMDG: International Maritime Code for Dangerous Goods
- IMO: International Maritime Organization
- INDEX NUMBER: Identification Number in the Annex VI of the CLP
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- OEL: Occupational Exposure Levels
- PBT: Persistent, Bioaccumulative and Toxic according to REACH
- PEC: Predicted Environmental Concentration
- PEL: Predicted Exposure Level
- PNEC: Predicted No Effect Concentration
- REACH: CE Regulation 1907/2006
- RID: Regulation for the International transport of Dangerous goods by rail
- 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: Weighted Average exposure limit
- VOC: Volatile Organic Compound
- vPvB: Very Persistent and Very Bioaccumulative according to REACH
- WGK: Wassergefährdungsklasse (Water hazard class, Germany).

GENERAL BIBLIOGRAPHY:
1. Regulation (CE) 1907/2006 of the European Parliament (REACH)
2. Regulation (CE) 1272/2008 of the European Parliament (CLP)
3. Regulation (UE) 790/2009 of the European Parliament (I Atp. CLP)
4. Regulation (UE) 2015/830 of the European Parliament
5. Regulation (UE) 286/2011 of the European Parliament (II Atp. CLP)
6. Regulation (UE) 618/2012 of the European Parliament (III Atp. CLP)
7. Regulation (UE) 487/2013 of the European Parliament (IV Atp. CLP)
8. Regulation (UE) 944/2013 of the European Parliament (V Atp. CLP)
9. Regulation (UE) 605/2014 of the European Parliament (VI Atp. CLP)
10. Regulation (UE) 2015/1221 of the European Parliament (VII Atp. CLP)
11. Regulation (UE) 2016/918 of the European Parliament (VIII Atp. CLP)
12. Regulation (UE) 2016/1179 (IX Atp. CLP)
13. Regulation (UE) 2017/776 (X Atp. CLP)
14. Regulation (UE) 2018/669 (XI Atp. CLP)
15. Regulation (UE) 2018/1480 (XIII Atp. CLP)
16. Regulation (UE) 2019/521 (XII Atp. CLP)
- 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
- Web site IFA GESTIS
- Web site of the ECHA Agency
- Database of SDS models of chemicals – Ministry of Health and National Institute of Health

Note for the user:
This information is based on our current knowledge. The user must ensure over the fitness and completeness of the information according to the specific use of the product. However this document shall not constitute a guarantee for any specific product.
This document should not be construed as a guarantee of any specific property of the product.
As the use of this product is not under our direct control, it is imperative from the user to observe under its own responsibility, current laws and directives about hygiene and safety. Responsibility for improper use are not taken.
Provide adequate training to personnel assigned to the use of chemicals.

Safety data sheet no.6 dated 21/03/2019. Complete revision of version n.3 dated 15/05/2015.