

SAFETY DATA SHEET

Product: SODIUM CYANIDE SOLUTION

Revision: 00

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SECTION 1: IDENTIFICATION

GHS Product identifier:	SODIUM CYANIDE SOLUTION.
Recommended use of the chemical and restrictions on use:	Industrial use.
Supplier's details:	PROQUIGEL QUÍMICA S/A.. Street Hidrogênio, 824 - Polo Industrial de Camaçari – Camaçari – BA - CEP: 42816-140, Brazil. (+55 71) 3878-6313. PROQUIGEL QUÍMICA S/A. Fazenda Caroba S/N, Conj. Industrial, Centro Industrial De Aratu - Candeias - BA - CEP: 43.813-000, Brazil. (+55 71) 3878-6633.
Emergency phone number:	0800 110 8270 Pró-Química.

SECTION 2: HAZARD IDENTIFICATION

Classification of the substance or mixture:	Corrosive to metals – Category 1. Acute Toxicity Oral – Category 2. Acute Toxicity Dermal – Category 1. Acute Toxicity Inhalation – Category 2. Skin corrosion/irritation – Category 2. Serious eye damage/eye irritation – Category 2A. Specific target organ toxicity following repeated exposure – Category 1. Hazardous to the aquatic environment, short-term (acute) – Category 1. Hazardous to the aquatic environment, long-term (chronic) – Category 1.
Classification system adopted:	Globally Harmonized System of Classification and Labelling of Chemicals (GHS), United Nations, 2023.
Other hazards which do not result in classification:	No other hazards of the product are known.

GHS label elements, including precautionary statements

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Pictograms:



Signal word:

DANGER

Hazard statement(s):

H290 May be corrosive to metals.
H301 + H331 Toxic if swallowed or if inhaled.
H310 Fatal in contact with skin.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H372 Causes damage to the thyroid through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statement(s):

PREVENTION

P234 Keep only in original packaging.
P260 Do not breathe mists and vapors.
P262 Do not get in eyes, on skin, or on clothing.
P264 + P265 Wash hands thoroughly after handling. Do not touch eyes.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or with adequate ventilation.
P273 Avoid release to the environment.
P280 Wear protective gloves, protective clothing, eye protection, face protection and hearing protection.
P284 In case of inadequate ventilation wear respiratory protection.

RESPONSE PRECAUTIONARY

P316 Get emergency medical help immediately.
P320 Specific treatment is urgent see on label.
P321 Specific treatment see on label.
P330 Rinse mouth.
P390 Absorb spillage to prevent material damage.
P391 Collect spillage.

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P301 + P316 IF SWALLOWED: Get emergency medical help immediately.

P302 + P352 IF ON SKIN: Wash with plenty of water.

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P332 + P317 If skin irritation occurs: Get medical help.

P337 + P317 If eye irritation persists: Get medical help.

P361 + P364 Take off immediately all contaminated clothing and wash it before reuse.

P362 + P364 Take off contaminated clothing and wash it before reuse.

STORAGE

P405 Store locked up.

P406 Store in a corrosion resistant. Container with a resistant inner liner

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.

DISPOSAL

P501 Eliminate the content and the container of compliance with local, state and federal laws.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS**MIXTURE**

Ingredients and impurities that contribute to the hazard:

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Chemical identity	Concentration	CAS number	GHS Classification*
Water	63.5 – 66.0%	7732-18-5	Not classified as hazardous
Sodium cyanide	33.0 – 35.0%	143-33-9	H290; H300; H310; H330; H372; H400; H410
Sodium hydroxide	10 – 1.5%	1310-73-2	H290; H302; H314; H318; H335; H402

*Hazard statements are described in section 16.

SECTION 4: FIRST-AID MEASURES**Routes of exposure**

Inhalation:	Remove the victim to a ventilated area and keep him/her at rest in a position that is comfortable for breathing. If he/she feels unwell, immediately contact a POISON CENTER or doctor. Take this SDS with you.
Skin:	In case of skin contact, immediately remove all contaminated clothing. Wash immediately with plenty of running water for at least 15 minutes. Wash contaminated clothing before reusing. Seek medical attention and bring this SDS.
Eye:	Rinse thoroughly with water for several minutes. If you wear contact lenses, remove them if easy to do so and rinse again. Seek medical attention immediately. Bring this SDS.
Ingestion:	Do not induce vomiting. Do not give anything by mouth to an unconscious person. Wash the victim's mouth with plenty of water. If vomiting occurs, tilt the patient forward or place him or her on the left side (up if possible) to keep the airway open and prevent aspiration. Keep the patient quiet and maintain a normal body temperature. Contact a POISON CENTER or doctor immediately. Bring this SDS.
Most important symptoms/effects, acute and delayed:	Toxic if swallowed or inhaled. Fatal in contact with skin. Causes skin irritation with redness, dryness and peeling. It causes severe eye irritation with pain, redness and tearing. Repeated exposure may cause damage to the thyroid. In low concentrations, it can produce several nonspecific symptoms,

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 Indication of immediate
 medical attention and special
 treatment needed, if
 necessary:

such as headache, dizziness, nausea, vomiting, confusion, coma and urinary and fecal incontinence.

Exposure to high concentrations can lead to a series of signs and symptoms, such as dyspnea, incoordination of movements, convulsions, coma and heart and/or respiratory failure, culminating in death.

Consult this SDS for a detailed medical protocol on the treatment of Cyanide Poisoning. Avoid contact with the product when assisting the victim. If the product comes into contact with the victim's skin or clothing, remove them immediately and wash with plenty of water. If the victim presents symptoms, antidotes may be necessary.

Administer according to clinical symptoms:

- **Oxygen** – Offer a concentration of 100% when possible.
- **Amyl Nitrite** – **When available**, place near the victim's nostril for 15 seconds. If breathing does not return to normal, repeat the operation every 2 minutes.
- **Sodium Nitrite** – Start with doses of 50 mg IV, with an average treatment dose of 300 mg, not to exceed 600 mg.
- **Sodium Thiosulfate** – Start with a dose of 12.5 g IV, not to exceed 175 g.
- **Cyanokit** (Hydroxycobalamin) – Start with a dose of 5 g IV, not to exceed 10 g.
- **Methylene Blue** – 100 to 200 mg IV should be used when the Methemoglobin level exceeds 30%.

NOTE: All IV antidotes may be diluted in 5% Glucose Serum or 0.9% Saline Serum.

The following is a suggestion for treatment with antidotes:

DEGREE OF INTOXICATION	SYMPTOM	ANTIDOTE TREATMENT	ANTIDOTE
Mild	Absence of symptoms, or mild symptoms: headache, asthenia, altered smell and taste and dyspnea.	Use a supportive treatment + O ₂ 100% + Amyl Nitrite (if available)	1 antidote
Moderate	It usually presents headache, vomiting and cardiac arrhythmias.	Use a supportive treatment + O ₂ 100% + + Amyl Nitrite (if	2 antidotes

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		available) + Sodium thiosulfate	
Serious	In addition to the symptoms described above, hot flashes, altered consciousness, seizures, and severe dyspnea may occur.	Use a supportive treatment + O ₂ 100% ++ Amyl Nitrite (if available) or sodium thiosulfate and / or sodium nitrite.	3 antidotes
Very serious	Presents loss of consciousness and respiratory and / or cardiorespiratory arrest.	Use a supportive treatment + O ₂ 100% + Amyl Nitrite (if available) / or sodium thiosulfate and / or sodium nitrite and / or cyanokit.	3 ou more antidotes

NOTE 1: Amyl Nitrite should not be considered as an antidote in isolation.

NOTE 2: Oxygen is a proven effective antidote and a mandatory first-choice tool in any cyanide emergency. It fully replaces Amyl Nitrite when the latter is not available.

SECTION 5: FIRE-FIGHTING MEASURES

Suitable extinguishing media:	Suitable: Dry chemical powder. Not recommended: Direct water jets and Carbon Dioxide (CO ₂).
Specific hazards arising from the chemical:	Sodium cyanide reacts with water to form hydrocyanic acid and sodium hydroxide. The reaction can release hydrogen cyanide vapor, which is highly toxic and flammable. Carbon dioxide (CO ₂) can react with sodium cyanide in the presence of water to form hydrocyanic acid and carbonic acid, increasing the risk. Combustion can release carbon oxides and other toxic compounds.
Special protective actions for fire-fighters:	Self-contained breathing apparatus (SCBA) with positive pressure and full protective clothing (considering heat-resistant clothing and exposure to the chemical). Containers and tanks involved in the fire should be cooled with water fog.

SECTION 6: ACCIDENTAL RELEASE MEASURES
Personal precautions, protective equipment and emergency procedures

For non-emergency personnel:	Preventatively isolate the leak from ignition sources. Evacuate the area to a radius of at least 25 meters. Keep unauthorized personnel away from the area. Stop the leak if this can be done without risk. Do not smoke. Do not touch damaged containers or spilled material
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	without wearing suitable clothing. Avoid exposure to the product. Use personal protective equipment as described in section 8.
For emergency responders:	Use full PPE with safety glasses, PVC or latex safety gloves, suitable protective clothing and closed shoes. The material used must be waterproof. In the event of a leak, where exposure is high, it is recommended to use respiratory protection equipment for mists and dusts or a self-contained system. Isolate the leak from sources of ignition. Evacuate the area within a radius of at least 100 meters. Keep unauthorized persons away from the area. Stop the leak if this can be done without risk.
Environmental precautions:	Prevent the product from reaching soil and watercourses. Notify the relevant authorities if the product has caused environmental pollution (if it has reached watercourses or if it has contaminated soil or vegetation).
Methods and materials for containment and cleaning up:	Do not allow water to enter containers. Use natural or spill containment barriers. Collect the product with absorbent material such as dry sand, earth, vermiculite, or any other inert material and place in appropriate containers and remove them to a safe place. For final disposal, proceed as per Section 13 of this SDS.

SECTION 7: HANDLING AND STORAGE**Precautions for safe handling**

Safe handling of the substance or mixture:	Schedule first aid before starting any activity with the product. The use of the product is restricted to professionals. Attention - Avoid exposure - obtain special instructions before use. Handle in a ventilated area or with a general ventilation/local exhaust system. Avoid formation of mists and vapors. Avoid exposure to the product. Avoid contact with incompatible materials. Use personal protective equipment as described in section 8.
General hygiene:	Wash your hands and face thoroughly after handling and before eating, drinking, smoking or using the toilet. Contaminated clothing should be changed and washed before reuse. Remove contaminated clothing and protective equipment before entering eating areas.

Conditions for safe storage, including any incompatibilities

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Technical measures for
prevention of fire and
explosion:

The product is not expected to present a fire or explosion hazard.

Adequate conditions:

Store in a cool, dry place with adequate ventilation. Keep away from open flames, high temperatures and incompatible materials. Store in the original, closed container. This product may react dangerously with some incompatible materials as highlighted in Section 10.

Packaging compatibilities:

It is recommended to keep them in their original packaging.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION**Control parameters**

Occupational exposure limit:

Chemical agent	TWA-TLV (ACGIH, 2025)
Cyanide Salts*	C 5 mg/m ³
Sodium hydroxide	C 2 mg/m ³

* Skin: Risk of skin absorption.

C: Ceiling.

Biological limit:

Not established.

Other limits and values:

Cyanide: IDLH (NIOSH, 2017): 25 mg/m³ (as CN).Sodium hydroxide (NIOSH, 2017): 10 mg/m³.Appropriate engineering
controls:

Provide mechanical ventilation and a direct exhaust system to the outside environment. These measures help reduce exposure to the product. Keep atmospheric concentrations of the product's constituents below the indicated occupational exposure limits.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection:

It is recommended to wear wide-vision safety glasses and a visor.

Skin protection:

It is recommended to use waterproof and chemical-resistant gloves, such as neoprene, butyl rubber or polyethylene, which must be

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	approved, and to ensure safe handling, a risk assessment must be carried out. Appropriate protective clothing and safety shoes.
Respiratory protection:	It is recommended to use a face respirator for mists and vapors, and depending on the exposure, a self-contained respirator is recommended. It is recommended that a risk assessment be carried out to adequately define respiratory protection considering the conditions of use of the product.
Thermal hazards:	There are no known thermal hazards from the products.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid.
Colour:	Pink to red.
Odour:	Characteristic.
Melting point/freezing point:	2°C.
Boiling point or initial boiling point and boiling range:	109°C (760 mmHg).
Flammability:	Not available.
Lower and upper explosion limit /flammability limit:	Not available.
Flash point:	Not applicable.
Auto-ignition temperature:	Not available.
Decomposition temperature:	Not available.
pH:	Approximately 11.0 (5 g/L aqueous solution).
Kinematic viscosity:	Not available.
Solubility:	Fully miscible in water.
Partition coefficient n-octanol/water (log value):	Log k _{ow} : -0.25.
Vapour pressure:	24 mmHg at 25°C.

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Density and/or relative density:	1.2 at 20°C.
Relative vapour density:	Not available.
Particle characteristics:	Not applicable.
Other information:	Not available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity:	No reactivity of the product is expected.
Chemical stability:	Stable product under normal temperature and pressure conditions.
Possibility of hazardous reactions:	When exposed to acids or carbon dioxide, hydrogen cyanide, which is combustible, may be released. It may react dangerously with nitric acid and alkali carbonates. Risk of explosion when in contact with alkali chlorates, alkali nitrates, alkali nitrites and oxidants.
Conditions to avoid:	High temperatures, ignition source, light and contact with incompatible materials.
Incompatible material:	Acids, oxidizing agents, carbonates, carbon dioxide and nitrites.
Hazardous decomposition products:	Decomposition of the product may release toxic gases such as hydrogen cyanide.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity:	<p>Toxic if swallowed or inhaled. Fatal in contact with skin.</p> <p><u>Sodium cyanide:</u> LD₅₀ (oral, rats): 5.09 mg/kg. LD₅₀ (dermal, rabbits): 7.35 mg/kg. LC₅₀ (inhalation, rats, 4h): 0.103 mg/L.</p> <p><u>Acute Toxicity Estimate of the Mixture – ATE_m:</u> ETAm (oral): 14.54 mg/L. ETAm (dermal): 21 mg/kg. ETAm (inhalation): 0.29 mg/L.</p> <p>Cyanide is extremely toxic; the hazard classification is based on the toxic effects it causes to humans. Exposure to high doses causes</p>
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	instantaneous death; less severe exposures produce weakness, headache, dizziness, mental confusion, anxiety, hyperpnea, and occasionally nausea and vomiting.
Skin corrosion/irritation:	Exposure to the product causes skin irritation with redness, pain and dryness. <u>Sodium hydroxide:</u> Ex vivo skin irritation test (OECD 435): corrosive result. However, at the concentration in which Sodium hydroxide is present in the product, it is only considered a skin irritant.
Serious eye damage/irritation:	May cause severe eye irritation with pain, tearing and redness. <u>Sodium hydroxide:</u> Eye irritation test on rabbits: results in irreversible eye damage. However, at the concentration in which Sodium hydroxide is present in the product, it is only considered an eye irritant.
Respiratory or skin sensitization:	The product is not expected to cause respiratory sensitization. <u>Cyanide:</u> The systemic toxicity of Cyanide is sufficiently high that acute toxicity and possibly lethality occur before inflammatory and immune responses result in sensitization.
Germ cell mutagenicity:	The product is not expected to cause germ cell mutagenicity. <u>Cyanide:</u> The mutagenicity of Cyanide has been investigated in gene mutation assays in bacterial and mammalian cell lines using a variety of methods to induce metabolic activation. Cytotoxicity was observed at very high test concentrations. <u>Sodium hydroxide:</u> <i>In vitro</i> genotoxicity tests indicate no evidence of mutagenic activity.
Carcinogenicity:	The product is not expected to have carcinogenic potential. <u>Cyanide:</u> Sodium cyanide is an alkaline salt of the Cyanide anion, CN ⁻ . These salts are soluble in water, resulting in the immediate formation of HCN. In a test with rats fed HCN-impregnated feed for 2 years, there was no increase in the incidence or development of tumors.
Reproductive toxicity:	The product is not expected to cause reproductive toxicity.
STOT - Single exposure:	Exposure to high doses causes instantaneous death; less severe

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	exposures produce weakness, headache, dizziness, mental confusion, anxiety, hyperpnea, and occasionally nausea and vomiting.
	Causes damage to the thyroid through repeated or prolonged exposure.
STOT - Repeated exposure:	<u>Cyanide:</u> Workers exposed to Cyanide salts have experienced headaches, dizziness, nausea, vomiting, and effects on the function and size of the thyroid gland. Sequelae after exposure to Cyanide: neurological damage, personality changes, memory deficits, disturbances in voluntary muscle movements, appearance of involuntary movements (i.e., extrapyramidal syndromes). ACGIH describes the effects that exposure to cyanide causes on the thyroid.
Aspiration hazard:	The product is not expected to present an aspiration hazard.

SECTION 12: ECOLOGICAL INFORMATION

	Very toxic to aquatic organisms, with long-lasting effects.
	<u>Cyanide:</u>
	LC ₅₀ (Fish, 96h): 0.0158 mg/L.
	LC ₅₀ (<i>Oncorhynchus mykiss</i> , 96h): 0.053 mg/L.
	LC ₅₀ (<i>Oncorhynchus mykiss</i> , 96h): 0.05 – 0.075mg/L.
	LC ₅₀ (Fish, 96h): 0.068 mg/L.
	ECr ₅₀ (<i>Chlamydomonas reinhardtii</i> , 72h): 0.331 mg/L.
	NOEC (Green algae, 10 days): 0.1 mg/L.
	NOEC (Fish): 0.002 mg/L.
	<u>Sodium hydroxide:</u>
	LC ₅₀ (Fish, 96h): 189 mg/L.
	LC ₅₀ (Fish, 96h): 196 mg/L.
	EC ₅₀ (Crustaceans, 48h): 40.4 mg/L.
Toxicity:	

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Persistence and degradability:	The product is not expected to be persistent but is expected to degrade rapidly. <u>Sodium cyanide:</u> Cyanide salts dissolve in water to form hydrogen cyanide. Biodegradability rate: 99% in 42 days.
Bioaccumulative potential:	The product is expected to have low bioaccumulative potential in aquatic organisms. <u>Cyanide:</u> Log kow: -0.25 (20°C).
Mobility in soil:	Not available.
Other adverse effects:	No other effects of the product are known.

SECTION 13: DISPOSAL CONSIDERATIONS**Elimination methods**

Product:	Treatment and disposal should be evaluated specifically for each product. Keep the remaining product in its original, tightly closed container. Disposal should be carried out as directed for the product.
Product remains:	Keep the remaining product in its original packaging and tightly closed. Dispose of according to the product's guidelines.
Packaging used:	Do not reuse empty packaging. These may contain product residue and should be kept sealed and sent for proper disposal as specified for the product.

SECTION 14: TRANSPORT INFORMATION

Road:	UN - "United Nations" Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations
UN Number:	3114
UN Proper Shipping Name:	SODIUM CYANIDE SOLUTION
Transport hazard class(es):	6.1
Packing group:	I
Rail:	Convention concerning International Carriage by Rail (COTIF) Appendix C - Regulations concerning the International Carriage of Dangerous Goods by Rail - RID

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UN Number:	3114
UN Proper Shipping Name:	SODIUM CYANIDE SOLUTION
Transport hazard class(es):	6.1
Packing group:	I
Sea:	<i>IMO – International Maritime Organization International Maritime Dangerous Goods Code (IMDG Code)</i>
UN Number:	3114
UN Proper Shipping Name:	SODIUM CYANIDE SOLUTION
Transport hazard class(es):	6.1
Packing group:	I
Marine pollutant:	The product is considered a marine pollutant (IMO).
EmS:	F-A, <u>S-A</u>
Air:	<i>IATA - International Air Transport Association Dangerous Goods Regulation (DGR)</i>
UN Number:	3114
UN Proper Shipping Name:	SODIUM CYANIDE SOLUTION
Transport hazard class(es):	6.1
Packing group:	I
Special precautions for user:	There is no need of special precautions.
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:	Consult regulations: - International Maritime Organization. MARPOL: Articles, protocols, annexes, unified interpretations of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto, consolidated edition. IMO, London, 2006. - International Maritime Organization. IBC code: International code for the construction and equipment of shipping carrying dangerous chemicals in bulk: With Standards and guidelines relevant to the code. IMO, London, 2007.

SECTION 15: REGULATORY INFORMATION

Chemical regulations

Convention concerning Safety in the use of Chemicals at Work (Convention 170) - International Labour Organization, 1990.
SGA. Globally Harmonized System of Classification and Labeling of

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Chemical Products. 10. Ed. New York: United Nations, 2023.

SECTION 16: OTHER INFORMATION

This SDS was prepared based on current knowledge about the proper product handling and under normal conditions of use, in accordance with the application specified on the packaging. Any other use of the product involving their combination with other materials, and use various forms of those indicated, are the responsibility of the user. Warns that the handling of any chemical substance requires the prior knowledge of its hazards for the user. In the workplace it is for the user company's product promotes training of its collaborators about the possible risks arising from exposure to the chemical.

SDS prepared in June 2025.

Hazard statements described in section 3:

H290 May be corrosive to metals.

H300 Fatal if swallowed.

H302 Harmful if swallowed.

H310 Fatal in contact with skin.

H314 Causes severe skin burns and eye damage.

H318 Causes serious eye damage.

H330 Fatal if inhaled.

H335 May cause respiratory irritation.

H372 Causes damage to the thyroid through prolonged or repeated exposure.

H400 Very toxic to aquatic life.

H402 Harmful to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists

AIHA – American Industrial Hygiene Association

BCF – Bioconcentration Factor

BEI – Biological Exposure Index

CAS – Chemical Abstracts Service

C – Ceiling

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EC₅₀ – Effective Concentration 50%
LC₅₀ – Lethal Concentration 50%
LD₅₀ – Lethal Dose 50%
ERPG - Emergency Response Planning Guidelines
LEL – Lower Explosive Limit
UEL – Upper Explosive Limit
NIOSH – National Institute of Occupational Safety and Health
OSHA – Occupational Safety & Health Administration
PEL – Permissible Exposure Limit
REL – Recommended Exposure Limit
STEL – Short Term Exposure Limit
TLV – Threshold Limit Value
TWA – Time Weighted Average

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