	MATERIAL SAFETY DATA SHEET OF CHEMICAL PRODUCT PHTHALIC ANHYDRIDE IN FLAKE	MSDS:	PET0001
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1. IDENTIFICATION

Product name:	PHTHALIC ANHYDRIDE IN FLAKE.
Internal product code:	N/A.
Recommended uses:	For industrial use only. Used in the production of plastics, resins, paints, pharmaceutical products and fungicides.
Company name:	PETROM – Petroquímica Mogi das Cruzes S/A
Address:	Rodovia Dom Paulo Rolim Loureiro, km 09, Vila Moraes – CEP: 08766-500 – Mogi das Cruzes – SP – Brasil.
Contact phone:	+55 (11) 4798-7500/7600
Emergency phone:	+55 (11) 4798-7500
Fax:	+55 (11) 4798-7501/7610
Website:	http://www.petrom.com.br
E-mail	petrom@petrom.com.br

2. HAZARD(s) IDENTIFICATION

Hazard classification according to OSHA Hazard Communication Standard (29 CFR 1910.1200).

2.1 Classification of a substance or mixture

Hazard Classification:	Category
Acute toxicity - Oral	4
Skin Corrosion/irritation	2
Serious Eye Damage/Eye Irritation	1
Respiratory sensitization	1
Skin sensitization	1
Specific target organ toxicity (single exposure)	3

2.2 Label elements of the GHS, including cautionary phrases



Pictograms:

Signal Word: **DANGER**


Hazard Statements:

- H302** - Harmful if swallowed.
- H315** - Causes skin irritation.
- H318** - Causes serious eye damage.
- H334** - May cause allergy or asthma symptoms or breathing difficulties if inhaled.
- H317** - May cause an allergic skin reaction.
- H335** - May cause respiratory irritation.

Precautionary Statements:

Prevention:

- P260** - Do not breathe dust/fume/gas/mist/vapors/spray.
- P261** - Avoid breathing dust/fume/gas/mist/vapors/spray.
- P264** - Wash hands thoroughly after handling.
- P270** - Do not eat, drink or smoke when using this product.
- P271** - Use only outdoors or in a well-ventilated area.
- P272** - Contaminated work clothing should not be allowed out of the workplace.

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P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P284 - [In case of inadequate ventilation] Wear respiratory protection.

Emergency Response:

P301 + P312 - IF SWALLOWED: call a POISON CENTER/doctor /physician IF you feel unwell.

P301 + P330 + P331 – IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

P302 + P352 + P338 - IN CASE OF CONTACT WITH SKIN: Wash with plenty of soap and water.

P303 + P361 + P353 - IF ON SKIN (or hair): Take off Immediately all contaminated clothing. Rinse SKIN with water [or shower].

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.

P310 - Immediately call a POISON CENTER or doctor/physician.

P312 - Call a POISON CENTER or doctor/... if you feel unwell.

P321 - Specific treatment (symptomatic) (see this label).

P330 - Rinse mouth.

P333 + P313 - IF SKIN irritation or rash occurs: Get medical advice/attention.

P342 + P311 - IF experiencing respiratory symptoms: Call a POISON CENTER/doctor.

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

P363 - Wash contaminated clothing before reuse.

Storage:

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

P405 - Store locked up.

Disposal:

P501- Dispose of contents/container in appropriate locations for waste / final disposal (appropriate landfill accredited by competent bodies and/or with specialized companies for incineration or another destination in accordance with the municipal and state laws of the region).

2.3 Other hazards that do not result in a classification


There are no other hazards.

3. COMPOSITION/INFORMATION ON INGREDIENTS

PHTHALIC ANHYDRIDE IN FLAKE is a SUBSTANCE.

3.1 Mixtures

Chemical name:	Phthalic Anhydride.
CAS No.:	85-44-9
REACH No.:	01-2119457017-41-0016
Concentration Range:	99.5%
Molecular Formula:	C ₈ H ₄ O ₃
Synonyms:	Phthalic Acid Anhydride, 1,3- Dioxoftalano, Ftalanodiona, Acid Anhydride 1,2- Benzenedicarboxylic, 1,3 Ftalandiona, 1,3-Isobenzofurandiona, ESEN.
Impurities that may contribute to the danger:	Does not show impurities that may contribute to danger.

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4. FIRST AID MEASURES

First Aid Measures	Take the casualty to an aerated room. Remove contaminated clothing. Wash body parts affected with plenty of water. If the casualty is unconscious and not breathing anymore, perform artificial respiration or oxygenation. Take to the nearest medical service bringing this MSDS, the label and package leaflet of the product.
Inhalation	Place the victim in a lower and calm place protecting against hypothermia, and keep at rest in a position not difficult to breathe. Monitor respiratory function. If the victim is breathing with difficulty, supply oxygen. If necessary apply artificial respiration. Seek medical assistance immediately, taking this MSDS, the label and package leaflet of the product.
Skin contact	Wash exposed skin with a sufficient quantity of water to remove material. Wash contaminated clothing and shoes before reusing them. Seek medical assistance immediately, taking this MSDS, the label and package leaflet of the product.
Eye contact	Rinse affected eyes immediately for at least 15 minutes under running water with eyelids open. Remove contact lenses if present. Use preferably an eye washer. Seek medical assistance immediately, taking this MSDS, the label and package leaflet of the product.
Ingestion	Do not induce vomiting, however, it is possible that it may occur spontaneously and should not be avoided, lie the patient on her side with her head at a level lower than the waist to avoid residue aspiration. Rinse the mouth of the victim with water. Give plenty of water to drink, only if the person is conscious. Never give anything through the mouth if the victim is unconscious. Seek a doctor immediately taking this sheet, the packaging or label of the product.
Actions that should be avoided	Do not induce vomiting and do not administer anything orally if the person is unconscious.
Protection for first aid providers:	Avoid contact with the product while providing aid to the victim.

4.1 Symptoms and most important effects, acute or late

Harmful if ingested. Causes irritation to the skin. Causes severe ocular lesions. When inhaled can cause allergic symptoms, asthma or respiratory difficulty. May cause allergic reactions to the skin. May cause irritation to the airways. The symptoms include redness of the skin and eyes, pain, conjunctivitis and watery eyes. Cough, sore throat, wheezing, shortness of breath and burning sensation. Abdominal pain, vomiting and diarrhea.

4.2 Notes to physician


Treat according to the symptoms (decontamination, vital functions), no specific antidote known. Prophylaxis of pulmonary edema. Medical monitoring for at least 24 hours. Symptomatic treatment must include, above all, supportive measures such as correcting hydroelectrolytic and metabolic disorders and respiratory failure.

5. FIRE-FIGHTING MEASURES

Measures that must be taken to combat fire caused by the substance, or that occur in its surroundings.

5.1 Extinguishing Methods

Appropriate	Product is not flammable. Use dry chemical powder, carbon dioxide, alcohol-resistant foam or water spray.
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Not appropriate

Water jet extinguishers should be avoided in order not to cause spreading of the product to other regions.

5.2 Specific hazards of the substance or mixture

Special Procedures	Evacuate an 800-meter-radius area. Fire fight from a safe distance. Use full PPE and respiratory protection of autonomous type (SCBA) with positive pressure. Use levees to contain the water used in combat. Position yourself with your back to the wind. Use water mist to cool down equipment exposed in the vicinity of the fire.
Dangers arising from burning	Fire may produce asphyxiating gas from the phthalic anhydride. This product can accumulate static charges that can cause an electrical incendiary discharge. Combustion of the chemical product or its packaging may form irritating and toxic gases such as carbon monoxide and carbon dioxide.

5.3 Measures for protection of the fire fighting team

Respiratory protective equipment of autonomous type (SCBA) with positive pressure and full protective clothing. Containers and tanks involved in the fire must be cooled with water jets.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures


6.1.1 - For the staff that is not part of emergency services	Use water repellent overall, safety goggles against splashes, closed shoes, and nitrile rubber gloves or PVC or other impermeable material. Respiratory protection must be performed depending on the concentrations present in the environment or the extension of the spillage/leakage, as such, opt for respirators with filter A - P2. Avoid contact of the product with skin, eyes and mucous membranes. Do not handle broken packages, unless properly protected with the use of personal protective equipment. Do not touch or walk over spilled product. Move away any ignition sources. Do not smoke. Stay away from low-lying areas, having the wind on your back. <u>Personal precautions:</u> Use PPE, complete with suitable protective clothing, goggles against splashing, closed shoes, nitrile rubber gloves or PVC or other waterproof material. Use of respirators with filter A - P2 recommended.
6.1.2 - For emergency services staff	<u>Removal of ignition sources:</u> Interrupt the power supply and disconnect sources of sparks. Remove from the site any material that may start a fire (ex.: diesel oil spill). <u>Dust Control:</u> Cover with plastic tarp or apply water mist to prevent the spread of the material. <u>Prevention of inhalation and contact with the skin, mucous membranes and eyes:</u> Use clothes and accessories as described above. Use eye protection.

6.2 Precautions to the environment

Special Procedures	Do not allow it to reach pipes or waterways. In case of pollution of rivers, lakes, or drainage for sewage, contact competent authorities in accordance with local laws.
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6.3 Methods and materials for containment of cleaning

Methods for cleaning	<u>Paved Floor:</u> Use water mist or vapor suppressant foam to reduce the dispersion of vapors. Use natural barriers or containment of spillage. Collect spilled product and place in appropriate containers. Adsorb the remaining product, with dry sand, soil, vermiculite or other inert material. Place the adsorbed material in appropriate containers and remove them to a safe place. Soil: Remove the layers of contaminated soil until uncontaminated soil is reached, collect this material and place in a sealed container
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Prevention of secondary hazards	properly labeled; Water bodies Immediately stop collection for human or animal consumption, contact the nearest environmental agency and the emergency center of the company, as the measures to be adopted depend on the proportion of the accident, the characteristics of the water resource in question and the quantity of the product involved. For final disposal, proceed according to Section 13 of this MSDS. Do not dispose directly into the environment or into the sewer network. The diluted water originated from firefighting may cause pollution.
Procedures	Isolate a 25-meter-radius area (solid products), at a minimum, in all directions. Use PPE. Remove ignition sources. Contain the spill. Collect in containers for disposal. Avoid contamination of water courses.
Methods	Do not use empty packaging.


7. HANDLING AND STORAGE

7.1 Precautions for safe handling:

Guidelines for safe handling	Use the product following the recommendations of the manufacturer. Use PPE as described in Item 8. Avoid contact with skin, eyes and clothing. Keep people, especially children and pets away from the area of work. Do not come into direct contact with product. Keep product in its original container. Keep any leftovers of products in their original packages properly closed. Handle the product with appropriate local exhaust ventilation or in a well ventilated area, in open ambients, handle it downwind. In the case of intoxication symptoms, stop work immediately and proceed as described in item 4 of this sheet.
Exposure prevention for workers	Manipulate in a ventilated area or with general system of local ventilation. Use PPE as described in Item 8. Do not eat, drink or smoke when handling the product. Wash hands before eating, drinking, smoking or using the toilet. Upon opening the package do it so as to avoid spillage. Do not use individual protection equipment damaged and /or defective. Do not unclog nozzles, orifices, pipes and valves with the mouth. Do not manipulate and/or carry damaged packages. Adopt good personal hygiene practices. Do not store or consume food in the workplace. Contaminated clothing must be changed and washed before reuse. Remove clothing and contaminated protective equipment before entering eating areas.
Appropriate technical measures for the worker	<u>Appropriate</u> Wash contaminated clothing separately before reuse, avoiding contact with other utensils for personal use. Wash hands and face during breaks and at the end of working hours. <u>Inappropriate</u> : Do not wash contaminated clothes together with other pieces of clothing or utensils for personal use.

7.2 Conditions for safe storage, including any incompatibilities

Appropriate Conditions	Store in a hermetically closed container in a dry, cool, well-ventilated place away from incompatible materials. Carefully close open containers and store in a vertical position to prevent leaks. Always keep in containers which correspond to the original packaging. Observe the indications contained on the label. Protect from direct action of the sun. Keep away from sources of ignition. Keep away from heat. Do not eat, drink or smoke during handling. Wash hands and face thoroughly after handling. Contaminated clothing must be changed and washed before reuse. Tanks should be electrically grounded and have containment levee.
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Conditions to avoid	Sources of heat and direct sunlight.
Prevention of fire and explosion	It is not expected that the product present danger of fire or explosion. Keep the product away from heat, sparks, open flames and other ignition sources.
Product and incompatible materials / other information	Do not store together with food, rations, medications, beverages intended for human and animal consumption.
Safe materials for packaging	<u>Recommended:</u> Product is already packed in appropriate packaging. Store in metal or polyethylene drums.

8.EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Exposure limits occupational	Chemical name	Exposure Limit	Type	References
	Phthalic anhydride	2 ppm (12 mg/m ³)	PEL-TWA	OSHA
		1 ppm (6 mg/m ³)	REL-TWA	NIOSH
		0,002 mg/m ³ 0.002 mg/m ³ (inhalable fraction and vapor)	TLV-TWA	ACGIH
		0.005 mg/m ³ (inhalable fraction and vapor)	TLV-STEL	

Biological indicators	There are no biological indicators of exposure established.
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8.2 Engineering control measures

Adequate	The ventilation rate should be in accordance with the conditions. If applicable, use process protections, local exhaust ventilation or other engineering controls to keep the levels of material transported by air below the recommended exposure limits. It is mandatory to have facilities to wash out eyes and an emergency shower when handling this product.
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8.3 Personal protective measures



<u>Respiratory protection:</u>	Respirator with filter A - P2.
<u>Hand protection:</u>	Safety nitrile rubber or PVC gloves.
<u>Eye protection:</u>	Safety glasses with side protection against splashing.
<u>Protection for skin and body:</u>	Suitable protective clothing and closed shoes. The material used must be waterproof.
Thermal Hazards:	Does not present thermal hazards.

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Special Precautions: Keep PPE properly cleaned and under appropriate use conditions, performing periodic inspections and possible maintenance and/or replacement of damaged equipment.

Hygiene measures: Wash contaminated clothing separately, avoiding contact with other utensils for personal use.

Collective urgent measures: Emergency shower and eye washer.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Solid.
Form	Scales (flakes).
Color	White:
Odor and odor threshold:	Asphyxiant (limit of odor: 0.053 ppm).
Molecular weight	148.117 g/mol (Phthalic Anhydride).
pH	> 2.0.
Melting Point / Freezing point:	131.2°C.
Initial boiling point and boiling temperature range:	284.5°C.
Flash Point	151.7°C (closed vessel); 165°C (open vessel).
Rate of evaporation	Not available
Flammability	Not flammable. Combustible under specific circumstances.
Lower Limit/Upper limit of flammability or explosivity:	Lower: 1.7% vol. / Upper: 10.4% vol. LEL (dust): 1.5×10^{-5} g/cm ³ .
Vapor Density	5.1 (air = 1).
Relative density:	1.527 g/cm ³ (solid at 20°C); 1.2 g/cm ³ (liquid at 135°C).
Vapor Pressure	0.0005 mmHg (25°C).
Solubility	Soluble in water (0.6 g/100g water at 25 °C). Soluble in ethyl alcohol (< 1mg/mL at 19°C), Acetone (≥ 100 mg/mL to 19 °C) and benzene (6.2 g/100g of benzene).
Partition coefficient - n-octanol/water	logKow: 1.6.

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Autoignition temperature:	570°C.
Decomposition temperature	Not available
Viscosity	1.19 mPa.s (132°C).
Surface tension	Not available
Corrosiveness	Not available
Other information	Saturation concentration: 0.0016 g/m ³ (20°C); 0.0078 g/m ³ (30°C).

10. STABILITY AND REACTIVITY

10.1 Reactivity

There are no hazardous reactions known.

10.2 Chemical Stability

Stable under normal conditions of handling and storage. Does not undergo polymerization.

10.3 Possibility of hazardous reactions

Risk of explosion in contact with oxidizing agents, nitric acid, glycerin, copper oxide and sodium nitrite. The substance can react dangerously with strong bases, alcohols, metals and water.

10.4 Conditions to avoid

High temperatures and contact with incompatible materials. Avoid direct contact with sunlight.

10.5 Incompatible materials


Oxidizing agents, nitric acid, glycerin, copper oxide, sodium nitrite, strong bases, alcohols, metals and water.

10.6 Hazardous decomposition products

Thermal decomposition form irritating and toxic gases such as carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Acute toxicity:	<u>LD50 Oral in rats:</u> 1530 mg/Kg.
	<u>LD50 Dermal in rats:</u> >5000 mg/Kg.
	<u>LC50 Inhalation in rats:</u> Not available
Corrosion and skin irritation:	Causes irritation to the skin with redness and pruritus.
Severe ocular lesions /eye irritation:	Causes severe ocular lesions with burning, tearing, conjunctivitis, blurred vision and pain with the possibility of irreversible lesions.
Respiratory sensitization or to the skin:	May cause allergic reactions to the skin with dermatitis and pruritus. When inhaled can cause allergic symptoms, asthma or respiratory difficulties with shortness of breath and tiredness.
Chronic toxicity:	<u>Carcinogenicity:</u> It is not expected that the product present carcinogenicity.
	<u>Mutagenicity:</u> It is not expected that the product present mutagenicity in germ cells.

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Effects on reproduction:

It is not expected that the product present toxicity for reproduction.

Single exposure:

Systemic toxicity to target organ:

May cause irritation to the airways. If inhaled can cause respiratory irritation, bronchitis, emphysema and allergy or asthma with cough, sore throat and panting, short breathing and burning sensation.

Repeated exposure:

There are no data.

Aspiration hazard: It is not expected that the product present aspiration hazard.

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Toxicity to aquatic organisms: LC50 Fish (*Danio rerio*) (7d): 560 mg/L.
EC50 (*Daphnia magna*) (48h): >640 mg/L.
CE50 Algae (*Desmodesmus Subspicatus*) (72h): >= 100 mg/L.

Toxicity to other organisms: LC50 Birds: N/A.
LC50 Bees: N/A.
LC50 Earthworms: N/A.

Main effects: The product is not classified as dangerous for aquatic organisms.

12.2 Persistence and degradability

Readily biodegradable and low persistence.

Biodegradability: 85.2 after 14 days.

12.3 Bioaccumulative potential

Bioaccumulation is not expected in aquatic organisms.

logKow: 1.60

BCF: 4.053

12.4 Mobility in soil

High mobility in soil is expected.

12.5 Other adverse effects


There are no known other environmental effects for this product.

13. DISPOSAL CONSIDERATIONS

13.1 Recommended methods for final disposal

Product/Leftover of the product:

It must be disposed of as hazardous waste according to local legislation. Treatment and disposal should be evaluated specifically for each product. Federal, state and municipal laws should be consulted. Keep remnants of the product in its original packaging and properly closed. Disposal must be carried out according to the established for the product. Keep the remnants of the product in its original packaging and closed, in accordance with local laws.

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Used packaging: Used containers should be emptied in the best possible way and be disposed of according to the dangerousness of the content. Never reuse empty packaging, as they may contain residues of the product and shall be kept closed and forwarded to an appropriate location according to local legislation.

14. TRANSPORT INFORMATION

National and international regulations:

DOT Classification: (Inland Transport):

- NOT REGULATED AS DANGEROUS GOODS.

IATA Classification: (Air Transport):

- NOT REGULATED AS DANGEROUS GOODS.

I.M.O. Classification: (Maritime Transport):

- NOT REGULATED AS DANGEROUS GOODS.

DOT (Department of Transportation)

IATA (International Air Transport Association, Dangerous Goods Regulations).

I.M.O / the IMDG (International Maritime Dangerous Goods Code).

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

Component Marine Pollutants: This material does not contain any chemicals listed on the Hazardous Materials Table required by US DOT to be identified as a marine pollutant.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

Phthalic anhydride 85-44-9

SARA 313: 1 % de minimis concentration

CERCLA: 5000 lb final RQ ; 2270 kg final RQ

SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories

Acute toxicity; Skin Corrosion/Irritation; Respiratory/Skin Sensitization; Serious Eye Damage/Eye Irritation; Specific Target Organ Toxicity

U.S. State Regulations

The following components appear on one or more of the following state hazardous substances lists:


Phthalic anhydride 85-44-9 - CA: yes | MA: yes | MN: yes | NJ: yes | PA: yes

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65) - Not listed under California Proposition 65.

Canada Regulations - Canadian WHMIS Ingredient Disclosure List (IDL)

Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL - Phthalic anhydride 85-44-9 - 0,1%.

WHMIS Classification - D2A , D2B

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U.S. Inventory (TSCA) - Listed on inventory.

16. OTHER INFORMATION

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Recommended use- Follow all recommendations of use, storage, and disposal indicated by the manufacturer/registrant and described on the packaging, product package insert and cited in Section 1 of this MSDS.

Important Legal Notice Important- The data and information contained herein is provided in good faith and represent the best current knowledge about the matter, and are based from data supplied by the registrant company, manufacturer or importer of this product, available at the moment, however do not completely exhaust the subject. No warranty is given about the result of the application of such data and information, not absolving users/receivers /workers/employers of their responsibilities, at any stage of the handling, storage, processing, packaging and distribution of this material/product. Prevail over the data contained herein the provisions in the legislation, regulations and standards in force. The registrant assumes no liability for any losses, damages, or expenses related to the handling, storage, use or disposal of the product, repair of damages or compensation of any kind.

Be warned that the handling of any chemical substance requires prior knowledge of its dangers by the user. The company using the product should promote the training of its employees and contractors regarding the possible risks coming from the product.

This document is mandatory and provides information on various aspects of this material /chemical product regarding risks, handling, storage, emergency actions, protection, safety, health and the environment, the supplier of this material/product to the user/receiver/workers.

Glossary:

ACGIH – American Conference of Governmental Industrial Hygienists;

BCF - Bioconcentration Factor

GHS – Globally Harmonized System

CAS - *Chemical Abstracts Service*

LC50 – Lethal concentration 50%

LD50 – Lethal dose 50%

EC50 - Effective concentration

NFPA - *National Fire Protection Association*

PPE - Personal Protection Equipment

N/A – Not applicable;

N/A - Not available;

UN - The United Nations;

OSHA - *Occupational Safety and Health Administration*;

PEL -Permissible Exposure Limits;

REL - Recommended Exposure Limits;

TLV - *Threshold limit value*;

TWA – *Time Weighted Average*.

NBR - Brazilian Standard

ABNT - Brazilian Technical Standards

EPA – *Environmental Protection Agency*