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## 1 – IDENTIFICATION

**Name of product (commercial name):** phosphoric acid.

**Main recommended applications for substance or mixture:** food, animal nutrition and fertilizer.

**Restrictions of use:** Inappropriate product for direct use.

**Internal identification code of product(s):**

Food Grade Phosphoric Acid 85%

Food Grade Phosphoric Acid 80%

Food Grade Phosphoric Acid 70%

Technical Grade Phosphoric Acid 85%

Technical Grade Phosphoric Acid 80%

Technical Grade Phosphoric Acid 75%

Industrial Grade Phosphoric Acid J80

Industrial Grade Phosphoric Acid K75

Industrial Grade Phosphoric Acid Refined

**Name of Company:** ICL BRASIL LTDA

**Address:**

Office Facility: Rua George Ohm, 230 - 21º andar - São Paulo, SP, Brasil - 04576-020

Factory Facility: Parque Industrial de Cajati – BR 116 – KM 488 – CEP 111950-000 – Cajati – SP

**Company's Telephone Numbers:**


**Office facility:** +55(11) 2155-4500

**Factory facility:** +55(13) 3854-9451; fax: (13) 3854-1359

**Telephone number for emergencies:** +55(13) 3854-9462

**E-mail:** [roberto.bueno@icl-group.com](mailto:roberto.bueno@icl-group.com)

**Website:** [www.iclbrasil.com.br](http://www.iclbrasil.com.br)

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## 2 – IDENTIFICATION OF DANGERS

### Classification of danger posed by chemical product:

Acute toxicity – oral – category 4

Acute toxicity – dermal – category 5

Corrosion/skin rash – category 1C

Severe ocular lesions/ocular irritation – category 1

Specific target organs toxicity – individual exposure – category 3

**Classification system used:** ABNT-NBR 14725-2:2009 Norm – corrected version 2:2010.

Globally Harmonized System for Classification and Labeling of Chemical Products, UN.

Other dangers not resulting in classification: Other dangers are unknown.

Appropriate elements of labeling

### Pictograms:



**Word of warning:** Danger

### Danger phrase:

H302 Toxic if ingested


H313 May be toxic to skin if there is contact

H314 Provokes severe skin burns and eye damage

H335 May provoke irritation in airways

### Precaution phrases:

P261 Refrain from inhaling dust/fumes/gases/mist/steam/aerosol.

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P301 + P312 + P330 + P331 in the case of ingestion: If you should feel sick, contact TOXICOLOGY INFORMATION CENTER/physician. Water-wash mouth. Do not induce vomiting.

P303 + P361 + P353 in the case of contact with skin (or hair): Immediately remove all contaminated clothes. Water-wash skin/expose contaminated part of body to running water.

P304 +P 340 in the case of inhalation: Remove victim to ventilated area and keep him/her at rest in position that does not interfere with breathing.

P305+ P351 + P338 in the case of contact with eyes: Carefully expose eyes to running water for several minutes. In the case of use of contact lenses, remove them, if easy. Continue exposure to water.

P312 in the case of discomfort, contact TOXICOLOGY INFORMATION CENTER/physician.

### 3 – COMPOSITION AND INFORMATION ABOUT INGREDIENTS

#### **Substance**

**Chemical or commonly used name:** Phosphoric Acid

**Synonym:** Orthophosphoric acid


**CAS registration number:** 7664-38-2

**Impurities contributing to danger:** There are no impurities contributing to danger.

### 4 – FIRST AID MEASURES

#### **First-Aid Measures**

**Inhalation:** Remove victim to uncontaminated and drafty location. Keep victim at rest in position that does not interfere with breathing. Monitor respiratory function. If victim

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is breathing with difficulty, supply oxygen. Seek medical help. Bring this safety information document along.


**Skin contact:** Readily remove contaminated clothing and shoes. Wash affected parts with abundant running water for at least 15 minutes. Seek medical help. Bring this safety information file along.

**Contact with eye:** immediately wash eyes with running water for at least 15 minutes, while keeping eyelids open. Remove contact lenses as the case may be. Seek medical help immediately. Bring this safety information file along.

**Ingestion:** Never administer food or medication through mouth in unconscious victims or those seizing. Conscious victims may ingest water a little at a time so as not to induce vomiting. Do not induce vomiting after ingestion of acids. Seek medical help. Bring this safety information file along.

**Major, acute or belated symptoms and effects:** Toxic if ingested and potentially toxic if in contact with skin. May provoke burning sensation, abdominal pain, electric shock or collapse, nausea, vomiting, bloody diarrhea. Provokes severe burns with blisters, burns, redness, dryness and skin pain, as well as damage to the eyes with burning, redness, tearing, conjunctivitis, wheezing, sneezing, salivation, difficulty breathing and risk of pulmonary edema.

**Note to physician:** Avoid contact with product upon assisting victim. Keep at rest and warm. Symptomatic treatment should include, above all, such support measures as correction of hydroeletroliticand metabolic disorders, aside from respiratory assistance. In the case of contact with skin, do not rub damaged region. Monitor arterial gases. Gastric lavages should not be considered routine upon ingestion. Weigh the benefits based on the amount ingested and the time since ingestion. Consider the risk of metabolic disorders and gastrointestinal lesions.

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## 5 – FIREFIGHTING MEASURES

**Means of extinguishing fire:** Appropriate: compatible with any means of extinguishing fire. Not recommended: direct water jets.

**Specific dangers posed by mixture or substance:** In combustion, mixture or substance may form such irritant and toxic gases as carbon oxide or dioxide.

**Protection measures taken by the firefighting team:** Breathing protection equipment of the autonomous type (SCBA) with positive pressure and complete protective attire.


## 6 – CONTROL MEASURES FOR SPILLS AND LEAKAGES

### Personal precautions

**For staff not related with emergency services:** Preventively remove all sources of ignition. Avoid sparks or flames. Do not touch the damaged containers or the spilled material without use of appropriate attire. Avoid inhalation, contact with eyes or skin. Use individualized protection gear, as described in section 8.

**For staff from emergency services:** Wear all-PVC acid resistant protective gear, protective goggles and gloves. The gloves must be made of natural rubber or natural latex, polychloroprene, nitrile rubber/latex, butyl rubber – butyl, fluorocarbon rubber or polyvinyl chloride – PVC. In the case of major leakages, where exposure is significant, one recommends using protective respiratory equipment with filters to block out steam and mist. Air purifying respirators with acid gas blocking filters or multiuse. If there is a larger concentration, use a self-contained breathing apparatus. Masks equipped with mechanical filters do not protect workers exposed to oxygen deprived atmosphere. The following filter is recommended: P2 or P3 particle filter.

**Precautions in the environment:** Make sure the spilled product does not reach watercourses and sewer system. It may contaminate the watercourses by making

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them improper for use of any type. High concentrations in the air put both human and animal life at risk.

**Methods and materials to contain and clean:** Use water steam or suppressing steam foam to reduce steam dispersion. Use natural hurdles or those for containing spills. Collect spilled product and place in specific containers. Absorb whatever amounts of the product are left with

dry sand, earth, vermiculite, or any other inert material. If possible, transfer product. Never use organic material to absorber leakages. Place absorbed material in specific containers and transport them to safe place. Put absorbing material used in spill to waste in an adequate landfill. Slowly and carefully neutralize residue before taking it to final disposition. For final destination, proceed as described in Section 13 herein.


**Differences in actions in major and minor leakages:** there are no distinctions between the actions to be taken for major or minor leakages of this product.

## 7 – HANDLING AND STORING

### **Appropriate technical measures for handling**

**Precautions for safe handling:** handle material in ventilated area or in one with a general ventilation system/local exhaust system. Avoid the formation of steam/mist. Avoid inhaling product in the cases where there is formation of steam or mist. Avoid contact with eyes and prolonged contact with skin and clothes. Wear protective gloves, protective attire, protective goggles, and face protecting gear, as described in section 8.

**Hygiene measures:** Do not eat, drink or smoke while handling the product. Thoroughly wash your hands before eating, drinking, smoking or going to the bathroom. Contaminated clothes should be changed and washed before they can be worn again.

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**Safe storage conditions, including any incompatibility**

**Fire and explosion prevention:** Remove all sources of ignition. Keep product away from heat, sparks, open flames/heated surfaces. Do not smoke.

**Adequate conditions:** Keep product in its original package and in fresh, dry place, protected from direct sun light and fire proof. Keep containers tightly closed. Store product in a distant location from foods. Out of the reach of children. There is no need for addition of stabilizers and antioxidants to ensure durability of the product.

**Food grade acid:** Store solution in location at temperature of 15°C to avoid crystallization.

**Technical Grade Acid:** Keep solution in location at temperature of 0° C to avoid crystallization.

**Industrial Grade Acid:** Keep solution in location at temperature of 0° C to avoid crystallization.

**Packaging material:**

**Storage tanks:**

**Metal sheets:** 316L stainless steel or Teflon or rubber covered;

**Flange:** 316L stainless steel or Teflon or rubber covered;

**Tubes:** 316L stainless steel or Teflon or rubber covered

**Tube Joints:** 316L stainless steel or Teflon or rubber covered

**Lining:** chlorobutyl rubber


Trucks:

**Metal sheets:** 316L stainless steel;

**Flange:** 316L stainless steel

**Tubes:** 316L stainless steel

**Tube joints:** 316L stainless steel

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## 8 – EXPOSURE CONTROL AND INDIVIDUAL PROTECTION

### **Control parameters**

#### **Occupational exposure limits:**

**Chemical or common name: Phosphoric Acid**

**TLV – TWA (ACGIH, 2011):** 1 mg/m<sup>3</sup>

**TLV – STEL (ACGIH, 2011):** 3 mg/m<sup>3</sup>

**Biological indicators:** not available.

**Engineering control measures:** promote combined ventilation or local exhaust. One recommends making emergency showers and eye wash station available inside work area. Keep concentrations of the substance or mixture in the air below the occupational exposure limits indicated. The engineering control measures are the most effective to reduce exposure to the product.

#### **Personal protection measures**


**Protection for eyes and face:** protective goggles.

**Protection for skin and body:** complete protective attire, acid resistant PVC and protective gloves. Protective material for the skin should be sufficiently impermeable and resistant to corrosive products. Check tension before using. Latex and leather gloves are completely inappropriate. The following materials are appropriate as those for protective gloves (permeation time  $\geq$  8 hours): natural rubber/natural latex – NR (0.5 mm) (not for use with dust and allergenic free products); polychloroprene – CR (0.5 mm); nitrile rubber/nitrile latex – NBR (0.35mm); butyl rubber – Butyl (0.5 mm); fluorocarbon rubber – FKM (0.4 mm); polyvinyl chloride – PVC (0.5 mm).

**Respiratory protection:** respiratory protective equipment with vapor/mist blocking filter. Air purifying respirators with acid gas blocking filter or multiuse. In the case of big concentrations, wear air purifying respirator. Masks equipped with mechanical filters do not protect workers exposed to oxygen deprived atmosphere. The following filter is recommended: P2 or P3 particle filter.

**Thermic danger:** There are no thermal dangers.



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## 9 – PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Food Grade Phosphoric Acid

**Aspect (physical state, form and color):** syrupy colorless liquid

**Odor and odor limit:** characteristically acid

pH: <1

**Fusion and freezing points:** 42°C / 21°C

**Initial boiling point and boiling temperature range:** 158°C

**Flash point:** not available.

**Evaporation point:** not available

**Flammability (solid; gas):** not available

**Upper/lower flammability or explosivity limits:** not available.

**Vapor pressure:** not available.

**Vapor density:** not available

**Relative density:** not available

**Solubility:** soluble in water


**Partition coefficient – n –octanol water:** not available

**Auto-ignition temperature:** not available.

**Decomposition temperature:** not available.

**Viscosity:** not available.

**Other information:** Density: 1.572 to 1.686 g/ml; concentration: 75 to 85% (H<sup>3</sup>PO<sup>4</sup>).  
In addition to being corrosive, product cannot be heated as it would have an oxidant effect.

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## 9.2. Technical Grade Phosphoric Acid

**Aspect (physical state, form and color):** syrupy colorless liquid

**Odor and odor limit:** characteristically acid

pH: <1

**Fusion point/freezing point:** 42°C / 15°C

**Initial boiling point and boiling temperature range:** 158°C

**Flash point:** not available

**Evaporation rate:** not available

**Flammability (solid; gas):** not flammable.

**Lower/upperflammability or explosivity limits:** not available.

**Steam pressure:** not available

**Steam density:** not available

**Solubility:** soluble in water

**Partition coefficient – n – octanol water:** not available

**Auto-ignition temperature:** not available.

**Decomposition temperature:** not available.

**Viscosity:** not available.

**Other information:** Density: 1.572 to 1.686 g/mL; concentration: 75 to 85% (H<sub>3</sub>PO<sub>4</sub>).

In addition to being corrosive, product cannot be heated as it would have an oxidant effect.


## 9.3 Industrial Grade Phosphoric Acid (J80, K75 and Refined)

**Aspect (physical state, form and color):** Syrupy liquid, light to dark brown or light to dark green.

**Odor and odor limit:** characteristically acid

pH: <1

**Fusion point/ freezing point:** 42°C / 5°C

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**Initial boiling point and boiling temperature range:** 158°C

**Flash point:** Not available

**Evaporation rate:** not available

**Flammability (solid; gas):** not flammable

**Lower / Upper flammability or explosivity limits:** not available

**Steam pressure:** not available

**Steam density:** not available

**Relative density:** not available

**Solubility:** soluble in water

**Partition coefficient – n – octanol water:** not available

**Auto-ignition temperature:** not available

**Decomposition temperature:** not available

**Viscosity:** not available

**Other information:** Density: 1.500 to 1.780 g/mL; Concentration: 25 to 62% (P<sub>2</sub>O<sub>5</sub>).


In addition to being corrosive, product cannot be heated as it would have an oxidant effect.

## 10 – STABILITY AND REACTIVIT

**Reactivity:** Product presents reaction potential.

**Chemical stability:** Stable under usual handling and storage conditions.

**Possibility of dangerous reactions:** Product attacks several metals thus forming explosive and flammable gases. In contact with common metals, product releases

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hydrogen, a flammable gas, and may form an explosive mixture with the air. Product reacts violently with bases. Substance polymerizes violently under the influence of epoxide and azo compounds. When mixed with nitrogen can be explosive. Forms flammable gas with sulfites, mercaptans, cyanides and aldehydes.

**Conditions to be avoided:** Elevated temperatures. Sources of ignition. Contact with incompatible materials.

**Incompatible materials:** Phosphoric acid is a strong acting acid that reacts with alkali (bases), forming phosphate salts, which are corrosive to some types of metals and alloys. When reacting with chlorine and stainless steel, on being heated, may release hydrogen. Product produces exothermic reaction with aldehydes, amines, amides, alcohol, diol, nitrogenous compounds, carbamate, ether, caustics, phenols and cresols, ketones, organophosphates, epoxides, explosives, combustible products, unsaturated halides and organic peroxides. In contact with cyanides, sulfites, fluoride, organic peroxides, and organic halogenated product forms toxic fumes.

**Dangerous products of decomposition:** thermic decomposition produces phosphorus oxide fumes, irritant to the upper respiratory tract.

## 11 – TOXICOLOGICAL INFORMATION


**Acute toxicity:** Toxic if ingested. May be toxic in contact with skin. May provoke burning sensation, abdominal pains, shock or collapse, nausea, vomiting, bloody diarrhea.

**DL<sub>50</sub> (oral, rats):** 1250 mg/kg

**DL<sub>50</sub> (dermal, rabbits):** 2740 mg/kg

**Corrosion/skin rashes:** Provokes severe burns in skin with bubbles, burning, redness, skin dryness and pain.

**Severe ocular lesions/ocular irritation:** provokes damage to eyes with burning, redness, tearing, conjunctivitis and pain in the eyes.

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**Respiratory sensitivity or to the eyes:** May cause skin dermatitis. Exposure to liquid for extended periods may cause dryness and skin cracking.

**Mutagenicity in germ cells:** Product is not expected to present mutagenic potential for humans.

**Carcinogenicity:** Product is not expected to present carcinogenicity for humans.

**Toxicity to reproduction and lactation:** Product is not expected to present toxicity to reproduction and lactation.

**Toxicity to specific target organs – one-time exposure:** May provoke irritation in airways with coughing, wheezing, sneezing, salivation, difficulty breathing and risk of pulmonary edema.

**Toxicity to specific target – repeated exposures:** Repeated exposure may cause bronchitis, which might aggravate into coughing, phlegm, and/or difficulty breathing. Danger posed by aspiration: Danger posed by aspiration is not expected.

## 12 – ECOLOGICAL INFORMATION


### **Environmental effects, behavior and product of product**

**Ecotoxicity:** phosphoric acid is soluble in water. Even in low concentrations, it tends to reduce pH of water due to its acidity. Product is not considered dangerous for water life.

**Persistence and degradability:** Fast degradation and low persistence are expected. Bio accumulative potential: Contaminates soil, thus requiring neutralization and restoration work.

**Mobility in soil:** rapid mobility is expected in soil. Rapid dissipation of gaseous cloud.

**Other adverse effects:** Due to the corrosive nature of phosphoric acid, animals exposed to this product may suffer tissue damage and death depending on the concentration found in the environment. Plants contaminated with the product may adversely be affected or destroyed.

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### 13 – CONSIDERATIONS ABOUT THE FINAL DESTINATION

**Recommended methods for treatment and dispositions applied to product:** thoroughly neutralize with lime if possible. It should be put to waste as dangerous residue, according to resolution CONAMA 005/1993, NBR 10.004/2004 and state legislation. The treatment and disposition must be evaluated specifically for each product. It may be deposited in landfills, sent to an appropriate incineration unit or other form of elimination as long as it meets the requirements of local legislation.

**Remains of products:** keep remains of the product in its original package, duly sealed. Wasting must be carried out in accordance with what is established for the product.

**Used packages:** do not reuse empty packages. They main contain remains of the product and should therefore be kept sealed and sent for destruction in appropriate place.

### 14 – INFORMATION ABOUT TRANSPORTATION

#### **National and International Regulation**

**Terrestrial:** Resolution # 420 dated February 12<sup>th</sup>, 2004 issued by The National Terrestrial Transportation Agency (ANTT), approves complementary instructions to Terrestrial Transportation of Dangerous Products Regulations and its modifications.


**UN number:** 1805

**Appropriate name for shipping:** Phosphoric acid, liquid

**Risk class/main risk subclass:** 8

**Risk number:** 80

**Packing group:** III

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**Sea transport:** DPC – Directorate of Ports and Coasts (Transportation in Brazilian waters) Norms of the Maritime Authority (NORMAN).

**NORMAN 01/DPC:** Watercraft Employed in Open Sea Navigation

**NORMAN 02/DPC:** Watercraft Employed in in-country navigation.

IMO – “International Maritime Organization”

IMDG Code – International Maritime Dangerous Goods Code

**UN number:** 1805

**Proper shipping name:** PHOSPHORIC ACID SOLUTION

**Class or division:** 8

**Packing group:** III

**Marine pollutant:** N

**EmS:** F-A, S-B

**Airway:** ANAC – National Civil Aviation Agency – Resolution # 129 dated December 8<sup>th</sup>, 2009.

**RBAC # 175** – (Brazilian Civil Aviation Regulation) – Transportation of Dangerous Articles in Civil Aircrafts.

**IS N# 175 – 001** – Supplementary Instruction – IS

**ICAO** - International Civil Aviation Organization

**IATA** – International Air Transport Association

**DGR** - Dangerous Goods Regulation

**UN Number:** 1805


**Proper shipping name:** PHOSPHORIC ACID SOLUTION

**Class or division:** 8

**Packing group:** III

**Danger to environment:** Not so expected.

**Additional Regulations:** Regulation pertaining to transportation of product are abovementioned.

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## 15 – INFORMATION ABOUT REGULATIONS

**Specific regulations for chemical product:** Federal Decree # 2657, dated July 3<sup>rd</sup>, 1998.

**ABNT-NBR** norm 14725:2012

Law # 12,305, dated August 2<sup>nd</sup>, 2010 (National Policy Governing Solid Residue).

Decree # 7,404, dated December 23<sup>rd</sup>, 2010

Administrative Rule # 229, May 24<sup>th</sup>, 2011 – Alters norm # 26.

Administrative Rule # 1274, August 25<sup>th</sup>, 2003: Product subject to control and inspection by the Ministry of Justice – Federal Police Department – MJ/DPF, when importation, exportation, and re-exportation are in question previous authorization by the Federal Police Department is indispensable for realization of these operations.

## 16 – OTHER INFORMATION

Important information, but not specifically described in afore sections.

This file was written based on current knowledge of the chemical product supplies information as for protection, safety, health and the environment. Warning must be made to the fact handling of any chemical substance requires previous knowledge about its dangers by the user. It is in the discretion of the user of the product to promote training of its employees and contractors in the possible risks deriving from use of the product.

Legends and acronyms

**ACGIH** - American Conference of Governmental Industrial Hygienists

**DL<sub>50</sub>**–Lethal Dose 50%


**N** - No

**STEL** - Short term exposure limit

**TLV** - Threshold Limit Value

**TWA** - Time Weighted Average



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**UN** – United Nations

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