

SAFETY DATA SHEET**Product: PHTHALIC ANHYDRIDE**

Revision: 09

Date: 11/29/2010

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Revision 09: alteration on items: 1, 2, 3, 4, 9, 11 e 15.

1- IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Identification of the substance:

Product name: **PHTHALIC ANHYDRIDE**

Pré-registration number: CR248277-21

Use of the substance: Mostly used in the production of phthalic plasticizers, alkydic resins and polyesters resins. Also used in dyes phenolphthalein, PVC stabilizers, drying agents for paints and aro.

Supplier identification

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United Kingdom
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e-mail: ces-reachit-contact.reach@intertek.com**2- HAZARDS IDENTIFICATION**

Most important hazards:

Harmful if swallowed. Irritating to respiratory system and skin. Risk of serious eye damage. May cause sensitization by inhalation and skin contact.

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Product effects

Adverse human health effects: May cause burns to skin, eyes and gastrointestinal tract. May cause irritation to the respiratory tract and allergic reactions by inhalation and skin contact.

Environmental effects: May cause damage to the environment due to acid pH.

Physical and chemical hazards: When in contact with water it forms Phthalic Acid. May produce acrid smoke and fumes if burning.

Specific hazards: Not applicable.

Main symptoms: Skin and mucous membranes burns. Redness, tearing and eye pain. Cough, sore throat, difficulty breathing, nausea, burning sensation and abdominal pain.

Classification of the chemical product:

Classification system adopted: **REGULATION (EC) No 1272/2008 of the European Parliament and of the Council, of 16 December 2008.**

Hazard Class and Category: Acute toxicity (oral) - Category 4
Specific target organ toxicity — Single exposure - Category 3, Respiratory tract irritation
Skin irritation - Category 2
Serious eye damage - Category 1
Sensitization — Respiratory - Category 1
Sensitization — Skin - Category 1

Label elements according to Regulation 1272: 2008 (GHS)

Symbol:   
GHS07 GHS05 GHS08

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

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Precaution Statement:

P261: Avoid breathing dust/fume/gas/mist/vapours/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.
P280: Wear protective gloves/protective clothing/eye protection/face protection.
P285: In case of inadequate ventilation wear respiratory protection.
P301 + P312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P304 + P341: IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position 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.
P330: Rinse mouth.
P332 + P313: If skin irritation occurs: Get medical advice/attention.
P333 + P313: If skin irritation or rash occurs: Get medical advice/attention.
P342+ P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P362: Take off contaminated clothing and wash before reuse.
P363: Wash contaminated clothing before reuse.
P403 + P233: Store in a well-ventilated place. Keep container tightly closed.
P405: Store locked up.
P501: Dispose of contents/container to ...(in accordance to local legislation)

Classification system adopted:**European Chemical Bureau – European Community:
Directive 67/548/EEC (substances).**

Label elements according to Directive 67/548/EEC

Symbol:

Xn; R 22
Xi; R 37/38-41

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Hazard Class and Category:	Acute toxicity (oral) Respiratory and skin sensitization Serious eye damage Respiratory and skin irritation
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Risk Phrases:	R22: Harmful if swallowed. R37/38: Irritating to respiratory system and skin. R41: Risk of serious damage to eyes. R42/43: May cause sensitization by inhalation and skin contact.
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3- COMPOSITION/INFORMATION ON INGREDIENTS

Substance name:	PHTHALIC ANHYDRIDE
Chemical formula:	C ₈ H ₄ O ₃
Synonym:	Anhydride of Phthalic Acid, Anhydride of Acid 1,2 Benzene Di-Carboxylic
Concentration:	99,5%, minimum
CAS Number:	85-44-9
EINECS number:	201-607-5

4- FIRST-AID MEASURES
Exposure routes

Inhalation:	<p><u>Solid:</u> Move exposed person to fresh air. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In the event of any complaints or symptoms, avoid further exposure.</p>
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Inhalation:	<p><u>Liquid:</u> Remove victims from the danger zone without endangering your own safety. Move affected person to fresh air. If patient has difficulty breathing, administer oxygen, keep him calm and protect him from loss of warmth. Get medical attention.</p>
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Skin contact:

Solid: Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Liquid: Wash skin immediately with plenty of water and soap. Call a physician. **CONTACT WITH THE HOT MELT:** Cooling immediately with plenty of water. Do not remove product crusts which may have formed neither forcibly nor by applying any solvents to the skin involved. In order to obtain medical care for possible burns and for a smooth cleansing of the skin, seek medical advice immediately.

Eye contact:

Solid: Get medical attention immediately. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Liquid: Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek immediate medical attention.

Ingestion:

Solid: Wash out mouth with water. Move exposed person to fresh air. Keep person warm and at rest. If material has been swallowed and the exposed persons conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Liquid: Wash out mouth with water. Ensure that the patient drinks water. In any case, consult a physician.

Protection of first-aiders and/or
special notes to a physician:

Avoid contact with this product while helping the victim; keep the victim warmed. Symptomatic treatment should include, above all, measured of support as correction of hydro electrolytic and metabolic disturbances.

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5- FIRE-FIGHTING MEASURES

Suitable extinguishing media:	Combustible if heated. Compatible with dry chemical, water spray, carbon dioxide and polyvalent foam.
Special hazard arising from the chemical:	Vapor as well as dust of the product can form explosive mixtures with air. Phthalic Anhydride when stored in molten (liquid) form (thus, above its flash point) presents higher fire risk.
Special protective equipment for fire-fighters:	Use self-contained breathing apparatus (SCBA) operated in positive pressure mode and complete protective clothing.

6- ACCIDENTAL RELEASE MEASURES

Personal precautions:	Remove ignition sources. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid contact with skin and eyes. Use protective gloves, safety goggles and protective clothing.
Environmental precautions:	Prevent from entering into watercourses, sewerage and confined areas.
Cleaning up methods:	
Appropriate containment techniques:	Molten: contain the flow of product away from the spilling area; product will solidify. Solid: collect with a clean shovel, put in clean and dry vessels and cover them. Remove them from the spilling area. Neutralize traces of residues or very little spills that remained over the soil with sodium carbonate or bicarbonate and water, or alkaline substances.
Appropriate clean up procedures:	Discard any product, waste, container or wrapper available in an appropriate manner as not to harm the environment, according to federal regulations, state and local.
Inappropriate containment or clean up techniques:	Do not discard directly in the environment or the sewage network.

7- HANDLING AND STORAGE**Appropriate technical measures for handling**

Precautions for safe handling:

Avoid inhalation, contact with skin and eyes. Do not handle near incompatible materials. Use proper personal protective equipment as indicated in Section 8.

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Hygiene measures: Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Wash hands before eating, drinking, smoking or going to the toilet. Take off all contaminated clothing and wash before reuse.

Appropriate technical measures for storage

Conditions for safe storage: Keep only in original container, in a cool, dry, well ventilated place. Keep away from food. Store locked up. Keep out of reach of children. Avoid static electricity by grounding.

Solid: should be stored in covered area, signalized, well ventilated and protected from the sun and from ignition sources.

Molten: should be stored at temperatures between 160 and 165°C and inert atmosphere with nitrogen. Storage area should be provided with containment dike. Tanks should be heated with steam.

Incompatible products: Alkaline materials, oxidizers and strong acids. Copper oxide, nitric acid and sulfuric acid, sodium nitrite.

Packaging compatibilities

Recommended use: Solid: Milky polyethylene bags of 180 g/m²
 Molten: 316 stainless steel tanks (with steam coil)

8- EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limit values:	Substance	TLV – TWA (ACGIH)	REL – TWA (NIOSH)	PEL - TWA (OSHA)
		(ppm)	(ppm)	(ppm)
	Phthalic Anhydride	1	1	2

Exposure controls:

Engineering controls measures: The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. It is recommended safety shower and eye bath available near work side. Compressed air lines used for respiratory protection should be provided with purifiers. Engineering controls are the most effective way of reducing product exposure.

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Personal protective equipment:

Eye/face protection:	Protective safety goggles.
	Protective clothing. Safety leather shoes with rubber impermeable sole.
	Solid:
Skin/body protection:	Latex or PVC gloves. Overalls of single canvas with long sleeves and hood.
	Molten:
	Scrap gloves, scrap jacket and trousers and facial protection.
Respiratory protection:	Full face piece respirator for organic vapors. In cases of high potential of exposure use a supplied-air respirator, full facepiece, operated in positive-pressure mode.
Special precautions:	Avoid wear contact lenses while using this product.
Hygiene measures:	Do not eat, drink or smoke while using this product. Wash hands before eating, drinking, smoking or going to the toilet. Take off all contaminated clothing and wash before reuse.

9- PHYSICAL AND CHEMICAL PROPERTIES

General information:

Physical state: Solid (crystalline needles) or liquid

Colour: Solid: white
Molten: Colorless.

Odour: Irritant

Important health, safety and environmental information:

pH: Acid

Boiling point: 284.5 °C at 1013 hPa (Beilstein, 2003).

Flash point: 152°C (closed cup)
165°C (open cup)

Ignition point: 580°C (Chemsafe, 2008).

Explosive properties: Lower: 1.7% v/v
Upper: 10.5% v/v0.015 kg/m³ (inferior) for powder

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Vapour pressure:	0.0006 hPa at 26.6°C (Crooks, 1946).
Density:	1.527 g/cm ³ at 20°C (Beilstein, 2003).
Solubility (g/100g):	Formic acid: 470 g/L at 20°C (Beilstein, 2003) and soluble in carbon disulfide (Lewis, 1993).
Solubility in water (g/100g):	6000 – 16400 mg/L. (Lorz, 2002; Roempp, 2009; Merck Index, 2001; Kirk-Othmer, 2008).
Molecular weight	148.1156
Viscosity (cP):	1.19 mPa at 132°C (Kirk-Othmer, 2008); 1.125°C at 155°C (Beilstein, 2003).
Vapor density (Air=1):	5.1
Melting point:	131.6 °C (Lorz, 2007).
Refraction index:	1.5744 at 155°C
Critical volume:	368cm ³ /mol
Critical pressure:	47.6 bar
Critical temperature:	537°C
Partition coefficient n-octanol / water (long value):	Log Pow = measured: 1.60 (Hansch, 1995); calculated: 2.07 (Bayer Industry Services, 2004).

10- STABILITY AND REACTIVITY

Stability:	Stable under normal conditions of storage and handling. Polymerization will not occur.
Incompatible materials:	Alkaline materials, oxidizers and strong acids. Copper oxide, nitric acid and sulfuric acid, sodium nitrite.
Hazardous decomposition products:	Carbon dioxide and carbon monoxide. Reacts slowly with water to form Phthalic Acid.

11- TOXICOLOGICAL INFORMATION

Acute toxicity:	May cause coughing, shortness of breath, nausea, burning sensation and abdominal pain. Sore throat, edema and bleeding ulcer.
Acute toxicity: oral:	Rat (Wistar) LD50: 1530 mg/kg bw (male). Experimental result. Loeser E (1978). Rat LD50: 2500 — 5000 mg/kg bw. Experimental result. Hecht G (1954).

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	Rabbit LD50: ≥ 1000 mg/kg bw. Experimental result. Hecht G (1954).
Acute toxicity after inhalation exposure:	Rat (Sprague-Dawley): LC50 (4 h): > 2.14 mg/L air. Experimental result. Durando J (2010). OECD 403. Rat (albino) inhalation: LC50 (1 h): > 210 mg/m ³ air. Experimental result. Industrial Biotest Laboratories (IBT) unreliable test institute.
Acute toxicity: dermal	Rabbit: LD50: > 3160 mg/kg bw. Experimental result. Exxon (Chemical Hazard Data Sheet: Phthalic Anhydride, Number HDHEF-00026 (1996) Rabbit (albino): LD50: > 10000 mg/kg bw. Experimental result. Industrial Biotest Laboratories (IBT) unreliable test institute.
Acute toxicity: other routes	Guinea pig: intraperitoneal. LD50: < 100 mg/kg bw. Experimental result. Fassett DW (1963). Mouse: intraperitoneal. LD50: 165 mg/kg bw. Experimental result. Oettel H (1966).
Skin corrosion/irritation:	May cause severe irritation and burns the skin and mucous membranes with pain, itching and redness.
Skin irritation:	Rabbit (New Zealand White). not irritating. Experimental result. Thyssen J (1979). Rabbit (New Zealand White): slightly irritating. Experimental result. Gad SC, Walsh RD, Dunn, BJ (1986).
Serious eye damage/irritation:	May cause burns and severe eye irritation with pain, itching, redness and tearing.
Eye irritation:	Rabbit (New Zealand White): moderately irritating. Experimental result. Thyssen J (1979). Rabbit (New Zealand White): irritating. Experimental result. Gad SC, Walsh RD, Dunn, BJ. (1986).
Respiratory or skin sensitization:	May cause contact dermatitis, skin sensibilization, cronic eye irritation, asthmatic bronchitis.
Skin sensitisation:	Mouse (Balb/c): sensitizing. Experimental result. Van Och FMM, Slob W, de Jong WH, Vandebriel RJ, van Loveren H (2000). Mouse (CBA): Sensitising. Experimental result. Basketter DA, Scholes EW (1992). Assay equivalent or similar to OECD 429. Mouse (C57BL): sensitizing. Experimental result Hayashi M, Higashi K, Kato H, Kaneko H (2001).

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Mouse (various): sensitizing. Experimental result. Dearman RJ, Filby A, Humphres IR, Kimber I (2002) Plitnic LM, Loveless SE, Ladics GS, Holsapple MP, Smialowicz RJ, (2003) Van Och FMM, Van Loveren H, De Jong WH, Vandebriel RJ (2002) Vandebriel RJ, De Jong WH, Spiekstra SW, Van Dijk M, Fluitman A, Garssen (2000a). (LLNA)

Mouse (several strains were used; mostly CBA/Ca or BALB/c): Sensitising. Experimental result. Ashby J, Basketter DA, Paton D, Kimber I (1995) Dearman RJ, Basketter DA, Kimber I (1992) Haneke KE, Tice RR, Carson BL, Margolin BH, Stokes WS (2001) Kimber I, Hilton J, Weisenburger C (1989) Kimber I, Weisenberger C (1989). A murine locallymph node assay for (1989) Vandebriel RJ, De Jong WH, Spiekstra SW, Van Dijk M, Fluitman A, Garssen (2000b). Method (LLNA).

Guinea pig (Dunkin-Hartley): sensitizing. Experimental result. Basketter DA, Scholes EW (1992). Method: equivalent or similar to OECD 406.

Guinea pig: sensitizing. Experimental result. Gad SC (1988).

Monkey (macaca fascicularis): sensitising. Experimental result. Biagini RE, Bernstein DI, Gallagher JS, Moorman WJ, Knecht EA, Smallwood (1988).

Mouse (Balb/c and C57BL/6): sensitising. Experimental result. Dearman RJ, Basketter DA, Kimber I (1992) Dearman RJ, Filby A, Humphres IR, Kimber I (2002) Dearman RJ, Kimber I (1992) Dearman RJ, Warbrick EV, Humphreys IR, Kimber I (2000) Dearman RJ, Warbrick EV, Kimber I (1999) Hayashi M, Higashi K, Kato H, Kaneko H (2001)

Mouse (several strains were used): not sensitizing. Experimental result. Gad SC, Dunn BJ, Dobbs DW, Reilly C, Walsh RD (1986) Descotes J (1988).

Respiratory sensitisation:

Guinea pig (Hartley): sensitizing. Experimental result. Sarlo K, Clark ED, Ferguson J, Zeiss CR, Hatoum N (1994).

Guinea pig: sensitizing. Experimental result. Chernichenko IA, Vinogradov GI, Karandakova IM (1973) Sarlo K, Clark ED (1992)

Guinea pig: sensitizing. Experimental result. Blackwell MP (2000)

Guinea pig (Hartley): sensitizing. Experimental result. Blaikie L, Morrow T, Wilson AP, Hext P, Hartop PJ, Rattray NJ, Woodcock (1995).

Carcinogenicity:

Not listed as carcinogenic (IARC).

Reproductive toxicity:

Some data indicate that the product is possibly toxic to reproduction/development.

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12- ECOLOGICAL INFORMATION

Ecotoxicity:	Product may cause damage to the environment due to low pH.
Persistence/degradability:	It is expected that this product present rapid degradability and low persistence.

13- DISPOSAL CONSIDERATION**Recommended methods for safe and environmentally preferred disposal**

Disposal methods:	Prior to implementing land disposal of waste residue (including waste sludge), consult local legislation for adequate disposal methods. Empty containers can retain product residues and shall be disposed in accordance with the provisions proposed for the product.
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14- TRANSPORT INFORMATION**Solid****International regulations**

Land:	UN - "United Nations" Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations, 15th Edition, 2007. European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR), 2009.
Sea:	IMO - "International Maritime Organization" International Maritime Dangerous Goods Code (IMDG Code) - Incorporating Amendment 34-08; 2008 Edition.
Air:	IATA - "International Air Transport Association" Dangerous Goods Regulation (DGR) - 51th Edition, 2010.
UN classification number:	Not regulated

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Molten

International regulations

Land:	UN - "United Nations" Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations, 15th Edition, 2007. European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR), 2009.
Sea:	IMO - "International Maritime Organization" International Maritime Dangerous Goods Code (IMDG Code) - Incorporating Amendment 34-08; 2008 Edition.
Air:	IATA - "International Air Transport Association" Dangerous Goods Regulation (DGR) – 51th Edition, 2010.
UN classification number:	UN3256
Proper Shipping Name/Description:	LIQUID AT ELEVATED TEMPERATURE, FLAMMABLE, N.E. (Phthalic anhydride)
Class or Division:	3
Packing group:	III

15- REGULATORY INFORMATION

Regulatory:	Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorization and Restriction of Chemicals (REACH).
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Regulation 1272:2008: GHS, United Nations, 3th Revised Edition, 2009

ECB: Directives 67/548 e 1999/45

UN Recommendations on the TRANSPORT OF DANGEROUS GOODS. Model Regulations, 16th Edition, 2009

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16- OTHER INFORMATION

This information had been based on the current knowledge of the product and intended to describe safety, health and environmental hazards.

Warns that the manuscript of any chemical substance requires the previous knowledge of its hazards for the user. It is contained in the using company of the product promotes training of its employees about possible risks come upon of the product.

SDS elaborated by InterTox: October, 2009 – <http://www.intertox.com.br>

Abbreviations:

ACGIH – American Conference of Governmental Industrial Hygienists

BCF – Bioconcentration Factor

CAS – Chemical Abstracts Service

EINECS – European INventory of Existing Commercial chemical Substances

IARC – International Agency for Research on Cancer

LD₅₀ – Lethal Dose 50

NIOSH - National Institute for Occupational Safety and Health

OSHA - Occupational Safety & Health Administration

PEL – Permissible exposure limit

REL - Recommended Exposure Limit

TLV – Threshold Limit Value

TWA – Time Weighted Average

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