



Extended -SAFETY DATA SHEET

Prepared in accordance with Annex II of the REACH Regulation (EC) 1907/2006, Regulation (EC) 1272/2008 and Regulation (EC) 453/2010

PHTHALIC ANHYDRIDE SOLID (FLAKES) With less than 0.05% Maleic anhydride

Revision: 0 Last up date: Issued date: January, 2011 pag.1 / 34

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

1.1. Substance Identification

Trade name	PHTHALIC ANHYDRIDE (FLAKES) with less than 0.05% maleic anhydride
IUPAC name	2-Benzofuran-1,3-dione
Synonym	1,3 Isobenzofurandione ;1,2 benzendicarboxylic acid anhydride; phthalic acid anhydride
EC#	201-607-5
CAS #	85-44-9
Molecular Formula	C ₈ H ₄ O ₃
Molecular weight	148,12
REACH Registration number	01-2119457017-41-0012
Chemical characterization	Mono-constituent substance-organic

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

Identified use	Process category (PROC)	Product Category (PC)	Sector of Use (SU)	Article category (AC)	Environmental Release Category (ERC)
ES 1 Production	PROC 1, PROC 2 PROC 8b PROC 9	n/a	n/a	n/a	ERC 1
ES 2 Intermediate	PROC 1, PROC2, PROC 3, PROC 4 PROC 8b,	PC 19	SU 3 SU 8 SU 9	n/a	ERC 6a

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Identified use	Process category (PROC)	Product Category (PC)	Sector of Use (SU)	Article category (AC)	Environmental Release Category (ERC)
	PROC9				
ES 3 Monomer	PROC1, PROC2, PROC 3, PROC4, PROC 8b PROC9	PC 32	SU 3 SU 10 SU 12 SU 11	n/a	ERC 6c, 6d
ES4 Formulation, mixture, refilling and loading	PROC1, PROC2, PROC3, PROC4, PROC5, PROC 8b, PROC9	n/a	SU 3 SU 10	n/a	ERC2
ES5 Laboratory chemical	PROC 15	PC21	SU 22	n/a	ERC 8A, 8B

Uses advised against

There are no use advices against.

1.3. Details of the supplier of the safety data sheet

Name	S.C. OLTCHIM S.A
Address	1 Uzinei Street, 240050 Ramnicu Valcea, Romania
Phone N°	+40 250 701 200
FAX N°	+40 250 735 030
E-mail of competent person responsible for SDS in the MS or in the EU:	tehnich@oltchim.ro



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1.4. Emergency telephone

European Emergency N°:	112
Emergency telephone at the company:	+40/250/738141
Available outside office hours:	24h/day/365days

2. HAZARD IDENTIFICATION

2.1. Classification of the substance

2.1.1. Classification according to Regulation (EC) 1272/2008

Acute Toxicity categ 4-H302: Harmful if swallowed.

Skin Irritant categ. 2- H315: Causes skin irritation.

Eye Damage 1-H318: Causes serious eye damage.

Resp. Sensitizer- H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin Sensitizer1 -H317: May cause an allergic skin reaction.

STOT Single Exp. 3- H335: May cause respiratory irritation.

2.1.2. Classification according to Directive 67/548/EEC

Xn; R22 Harmful; Harmful if swallowed

Xi; R37/38 Irritant: Irritating to respiratory system and skin

Xi; R41 Irritant; Risk of serious damage to eyes.

R42/43 May cause sensitization by inhalation and skin contact.

2.2. Label elements

2.2.1. Labeling according to Regulation (EC) 1272/2008

Signal word: Danger

Hazard pictogram:

GHS08: health hazard



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GHS05: corrosion



GHS07: exclamation mark



Hazard statements:

H302: Harmful if swallowed.

H335: May cause respiratory irritation.

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.

Precautionary statements:

P261: Avoid breathing dust.

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.

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

P335 : Brush off loose particles from skin.

P363 : Wash contaminated clothing before reuse.

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.

P 304+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.

P342+P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

P405: Store locked up.



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

P501 : Dispose of contents/container according to valid regulations.

2.2.2. Labeling according to Directive 67/548/EEC

Indication of danger:

Xn - harmful



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

Safety-phrases:

S23 - do not breathe gas/fumes/vapour/spray (appropriate wording to be specified by the manufacturer) (vapour/spray)

S24/25 - avoid contact with skin and eyes

S26 - in case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S37/39 - wear suitable gloves and eye/face protection

S46 - if swallowed, seek medical advice immediately and show this container or label

2.3. Other effects

The substance does not meet the criteria for PBT or vPvB substance.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical name	PBT/ vPvB	CAS no/EC No/REACH No.	Classification according to Reg (EC) No. 1272/2008)	Classification according to D 67/548/EC	Concentr a tion, % (w/w)
Phthalic anhydride	No/No	85-44-9/201607-5/ 01-2119457017-41-	Acute Tox. 4:H302	Xi R22 Xi; R37/38	99.7



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Maleic Anhydride	No/No	0012 108-31-6/203-571-6	Skin Irrit. 2:H315 Eye Damage 1: H318 Resp. Sens.: H334 Skin Sens. 1:H317 STOT Single Exp. 3: H335 Acute Tox. 4 (*):H302 Skin Corr. 1B:H314 Resp. Sens. 1:334 Skin Sens. 1:H317	Xi; R41 R42/43 Xn; R22 C; R34 R42/43	<0.05
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Impurities

No impurities relevant for classification and labeling.

See section 16 for the full text of the R phrases and H-statement declared above

4. FIRST - AID MEASURES

4.1 Description of first aid measures

General Advice: IF exposed or if you feel unwell: Call a Poison Center or doctor/physician. Show this safety data sheet to the doctor in attendance.

Seek medical attention immediately in all cases of exposure!

If inhaled: Remove to fresh air. If not breathing give artificial respiration. If breathing is difficult give oxygen. Do not use mouth- to-mouth resuscitation. Call a physician.

In case of skin contact: In case of contact remove any contaminated clothing. Wash skin with soap or mild detergent and plenty of water for at least 15 minutes. Wash clothes before reuse. Get medical attention.

In case of eyes contact: Remove contact lenses; flush eyes immediately with excess water for at least 15 minutes, lifting lower and upper eyelids occasionally; get medical advice /



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attention by an eye specialist afterwards immediately

Ingestion: Rinse mouth with cold water and drink much water in many little drafts (dilution effect); avoid vomiting; get medical advice / attention.

Never give anything by mouth to an unconscious person!

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

By inhalation: Dust or fumes can cause irritation of the nose throat and respiratory tract. Symptoms of exposure may include runny nose, coughing and nose bleeds, depending on severity of exposure. Severe over-exposure can produce lung damage, choking unconsciousness or death.

By skin contact: Hazardous in case of skin contact (corrosive, permeator). The amount of tissue damage depends on length of contact. Skin contact can produce inflammation, irritations and possible burning. Skin inflammation is characterized by itching scaling, reddening, or, occasionally, blistering.

By eye contact: Eye contact can result in corneal damage or blindness. Inflammation of the eye is characterized by redness, watering and itching.

By ingestion: Product ingestion causes irritations and possible burning to mouth, throat and stomach.

Chronic effects: Chronic exposure by inhalation or skin contact can cause allergic sensitization causes liver and kidney effects in laboratory animals.

4.3 Indication of immediate medical attention and special treatment needed

Treat symptomatically and supportively.

5. FIRE - FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media: Water spray, dry chemical, carbon dioxide and foam.

Unsuitable extinguishing media: Water jet or foam may cause frothing.

5.2 Special hazards arising from the substance or mixture

Exposure hazards: Combustible. Phthalic anhydride dust it is possible to form explosive mixture with air.

Hazardous combustion products: Carbon dioxide and carbon monoxide may form by combustion. In contact with hot water may form phthalic acid.



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5.3 Advice for firefighters

Special precautions for fire-fighters: Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Protection of fire-fighters: The fire fighters should wear full protective equipment and self-contained breathing apparatus with full face piece operated in positive pressure mode.

Other information: Do not get water inside containers/bags. Water spray or fog carefully applied to surface of the burning material can be used to extinguish the fire. Use water spray to prevent dust formation, absorb heat, keep containers cool and protect fire-exposed materials. Cool containers with flooding quantities of water until well after fire is out. Use water spray to flush spills from ignition source.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

For non-emergency personnel: Keep unnecessary and unprotected personnel away from entering. Avoid contact with skin, eyes, and clothing – wear suitable protective equipment (see section 8). Do not touch or walk through spilt material. Shut off all ignition sources.

For emergency responders: Remove ignition sources. Avoid dust formation; avoid contact with skin, eyes and clothing; provide adequate ventilation; warn persons sojourning in endangered areas; observe protective measures in sections 7 and 8.

6.2. Environmental precautions

Environmental precaution: Prevent from contamination the ground and surface area by isolating the hazard area. Contain and recover when possible. Keep closed container and dispose to all applicable federal, state, or local environment regulation.

6.3. Methods and materials for containment and cleaning up

Methods of cleaning up: Do not touch spilled material. Remove all ignition sources (heat, sparks and flames). Use non-sparking tools and equipment. Prevent material from entering sewers or confined spaces. For solid material spills, avoid generation dust. Contain spills and solution with earth, sand or absorbent material which does not react with spilled material. Shovel material into suitable, covered, labeled containers. Flush area with water. *Do not get water inside containers!*

6.4 Reference to other sections

Additional advice: Refer to section 8, 13.



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7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Protective measures: Protect against physical damage. Isolate from any sources of heat or ignition. NO SMOKING! Protect against moisture. It is also a combustible dust and so is a dust explosion hazard. Avoid static electricity, e.g. by grounding; keep implicitly away from ignition sources. Use non-sparking tools and equipment. All ignition sources are prohibited in area where phthalic anhydride is handled. Never add water to this product. Empty containers pose a fire risk; evaporate the residual under a fume hood.

Advice on general occupational hygiene: Avoid inhalation or ingestion and contact with skin and eyes. General occupational hygiene measures are required to ensure safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no drinking, eating and smoking at the workplace. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home.

7.2. Conditions for safe storage, including any incompatibilities

Phthalic anhydride should be stored in a tightly closed packaging in a cool, dry, well ventilated area away from sources of heat, moisture and incompatible substances.

Incompatible: Strong acids, strong bases, strong oxidizing agents, strong reducing agents, amines, ammonia

Incompatible materials for storage:

7.3. Specific end use(s)

Please check the identified uses from Section 1.2.

For more information please see the relevant exposure scenario, available via your supplier/given in the Annex I.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Exposure limit value:

Occupational Exposure Limit Values:

TLV (ACGIH) (threshold limit value): 1 ppm (6.1 mg/m³) TLV 1 mg/m³ (TRGS 900)

8.2 DNEL and PNEC values



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	water	sediment	soil	Sewage treatment plant
PNEC	5.6 mg/l	0.0826 mg/kg	0.153 mg/kg	10 mg/l
DNEL	dermal	inhalation	oral	
workers	10 mg/kg a.d	32.2 mg/kg a.d		
General population	5 mg/kg a.d	8.6 mg/kg u.d	5 mg/kg a.d	

8.3. Exposure control

Engineering control: A system of local and/ or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area.

Personal protective equipment

Respiratory protection: Protective respiratory equipment should be selected specifically for working place. Up to 30 mg/m³ use dust and mist respirator. Up to 60 mg/m³ use dust and mist respirator except single-use and quarter-mask respirator, full-face piece respirator with high-efficiency particulate filter, powered air-purifying respirator with dust and mist filter. In case of emergency situation (unknown concentrations) use positive pressure full-face piece.

Hand protection: Wear rubber and neoprene gloves.

Eye / Face protection: Use chemical safety goggles and/or a full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Skin protection: Wear impervious protective clothing, including boots, gloves, lab coat apron or coveralls as appropriate, to prevent skin contact.

9. PHYSICAL AND CHEMICAL PROPERTIES

General information

Appearance thin white flakes
Odor aromatic / irritant

Important health, safety and environmental information

Boiling point 284.5⁰C
Specific density 1.53 g/cm³, at 200⁰C
Bulk density 500-700 kg/m³



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Vapor pressure 20 °C	0.01mbar
Vapor density (air=1)	5.1
Solubility in water	6 g/l (forming phthatic acid)
Alcohol solubility	very good at 20°C monoester formation
Partition coefficient (log K _{ow})	0.73, 20°C
Flash point	152°C (close cup)
Explosive properties	explosive under open flame explosion limits in air % by volume : lel-1.7; uel-10.5

Other information

Melting point	131-133°C
Auto ignition temperature	580°C
Descomposition temperature	no descomposition

10. STABILITY AND REACTIVITY

10.1. Reactivity: See point 10.5.

10.2 Chemical stability: Stable under ordinary conditions of use and storage. Heat will contribute to instability. In molten state it should be covered with inert gas.

10.3 Possibility of hazardous reactions: Reacts with strong oxidizing agents.

10.4 Conditions to avoid: heat, flame, source of ignition and incompatibles.

10.5 Incompatible materials: Strong acids, strong bases, strong oxidizing agents, strong reducing agents, amines, ammonia, coatings, plastics, water.

10.6. Hazardous decomposition products: None. Slowly reacts with water to form phthalic acid.

11. TOXICOLOGICAL INFORMATION

	Conclusions
Acute toxicity	Oral: LD50 (rat): 1530 mg/kg bw (male) therefore a classification according to Reg. 1272/2008 as Acute Toxicity categ 4-H302 is justified. Dermal: LD50 (rabbit) >3160 mg/kg bw Inhalation: LC50 (rat) > 2140 mg/m ³ air (male/female) according to OECD Guideline 403



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Irritation/Corrosion	Skin irritation / corrosion: irritating; therefore a classification according to Reg. 1272/2008 as Skin Irritant categ. 2- H315 is justified Eye irritation: irritating; therefore a classification according to Reg. 1272/2008 as Eye damage categ 1 is justified.
Sensitisation	Skin: sensitizing and it is classified as skin Sens. 1, H317 Respiratory: sensitizing to respiratory system and it is classified as Resp. Sens. 1, H334
Repeated dose toxicity	Oral: NOAEL = 500 mg/kg bw/day Inhalation: no NOAEC identified Dermal: waiving. Phthalic anhydride is rapidly hydrolyzed to phthalic acid in contact with water; due to the ionic character of this compound only a marginal penetration though the skin barrier is expected.
Mutagenity	Phthalic anhydride was not mutagenic in the Ames test with and without metabolic activation (OECD 471).
Carcinogenity	No evidence of carcinogenicity was seen in rats after exposure to approximately 1000 mg/kg bw of phthalic anhydride or in male and female rats after exposure to 4670 and 3430 mg/kg bw, respectively, in comprehensive chronic (105-week) feeding study.
Toxicity for reproduction	No effects on reproductive organs were observed in an oral carcinogenicity study in rats and mice.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity

Short-term toxicity to fish

Brachydanio rerio (new name: *Danio rerio*)/fresh water/semi-static LC50 (7 days): 560 mg/L test mat.

Long-term toxicity to fish

Salmo gairdneri (new name: *Oncorhynchus mykiss*)/fresh water/semi-static NOEC (60 d): 10 mg/L test mat.

Short-term toxicity to aquatic invertebrates



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Daphnia magna/fresh water/static EC50 (48 h): > 640 mg/L test mat.

Long-term toxicity to aquatic invertebrates

Daphnia magna/freshwater NOEC (21 d): 16 mg/L test mat.

Algae and aquatic plants

Desmodesmus subspicatus (algae)/freshwater/static NOEC (72 h): \geq 100 mg/L test mat.

Toxicity to sediment

As for phthalic anhydride the trigger value for logKow is not exceeded and a low potential for adsorption is supposed, testing on toxicity towards sediment organisms is not necessary.

Toxicity to soil macro-organisms

The results of the chemical safety assessment indicates that exposure via these pathways would not be expected to result in an unacceptable level of risk for the terrestrial compartment. Therefore, no specific testing is required for the toxicity of phthalic anhydride to soil macroorganisms.

Resulting PNECs

	water	sediment	soil	Sewage treatment plant
PNEC	5.6 mg/l	0.0826 mg/kg	0.153 mg/kg	10 mg/l

12.2. Persistence and degradability:

12.2.1 Abiotic degradation

Photo degradation in air

In the atmosphere a half-life of 21.4 days for phthalic anhydride and 13 days for the hydrolysis product phthalic acid is estimated due to indirect photolysis with hydroxyl radicals, considering an OH-concentration of 500,000 radicals/cm³ as a 24-h average.

Photo degradation in water

In the hydrosphere, phthalic anhydride is transformed photo chemically under anaerobic conditions showing polymerization to polyphenyl. The half-lives are in the range from 3.9 h to 9.6 h following first other reactions. For photo oxidation in sea water a half-life of 0.93 hours is obtained.

Hydrolysis

Phthalic anhydride hydrolyses by 50 % within 30.5 seconds in the presence of water at pH 7 and 25 C, forming phthalic acid.



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12.2.2. Biotic degradation

The ready biodegradability of phthalic anhydride was determined in a modified MITI test comparable to OECD TG 301 C (Ready biodegradability: MITI (I) (Ministry of International Trade and Industry, Japan). 85 % degradation was observed after 14 days (MITI, 1992). Based on this result the substance is classified as readily biodegradable.

Degradation rate in water:	Hydrolysis - 30.5 seconds at pH 7.24 at 25°C Photolysis - 3.9 to 9.6 hours
Degradation rate in sediment:	Not relevant
Degradation rate in soil:	Not relevant
Degradation rate in air:	Atmospheric half-life of 21.4 d for phthalic anhydride Atmospheric half-life of 13 d for phthalic acid

12.3. Bioaccumulative potential:

Aquatic bioaccumulation

Calculated BCF values of 3.4 for phthalic anhydride and 3.16 for the hydrolysis product phthalic acid indicate no significant potential for bioaccumulation of both substances in aquatic organisms. (A logPow of 1.6 was used for calculation.)

Terrestrial bioaccumulation

In green house studies using ¹⁴C-phthalic acid as test substance bioaccumulation ratios of 0.013 for plants and 0.0046 for seeds were obtained (Dorney et al., 1985). This study demonstrates the relatively low potential for bioaccumulation of phthalic acid in plants.

12.4. Mobility

Water:

Air

Soil and sediments

log Pow = 0,73 (Phthalic acid at 20°C)

- BCF < 100

- Readily biodegradable

12.5. Results of PBT and vPvB assessment:

PBT	Evaluation
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Persistence	half-life of phthalic anhydride in all compartments (water, soil, air) < 40 days	not enough persistence for classification
Bioaccumulation	BCF of phthalic anhydride < 2000	not enough bioaccumulation for classification
Toxicity	acute oral toxicity of the substance: haz. cat. 4	substance is not classified as toxic

vPvB		Evaluation
very strong Persistence	half-life of phthalic anhydride in all compartments (water, soil, air) < 60 days	not enough strong persistence for classification
very strong Bioaccumulation	BCF of phthalic anhydride < 5000	not enough strong bioaccumulation for classification

13. DISPOSAL CONSIDERATIONS

This section contains generic advice and guidance.

13.1 Waste treatment methods

13.1.1 Product

Methods of disposal: The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spill material and runoff and contact with soil, waterways, drains and sewers.

13.1.2. Packaging

Methods of disposal: The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.



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14. TRANSPORT INFORMATION

ADR: Phthalic anhydride is not classified under ADR regulations.

RID: Phthalic anhydride is not classified under RID regulations.

Maritime transport IMDG: Phthalic anhydride is not classified under IMDG regulations.

Air transport ICAO/IATA: Phthalic anhydride is not classified under IATA regulations.

15. REGULATORY INFORMATION

15. REGULATORY INFORMATION

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorization

Substances of very high concern (Authorizations): Phthalic anhydride is not listed

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles

Restrictions on use: no restriction

Other EU regulations: Phthalic anhydride is not a SEVESO substance, not ozone depleting substance and not a persistent organic pollutant.

WGK (Germany): WGK 1 slightly water endangering

15.2 Chemical safety Assessment

A chemical safety assessment has been carried out for this substance. Relevant chapters of the resulting Chemical Safety Report (CSR) – exposure scenarios and risk management measures – are listed in the annex to this safety data sheet.

16. OTHER INFORMATION



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16.1. Full text of H-Statements referred to under sections 2 and 3

H302: Harmful if swallowed.

H335: May cause respiratory irritation.

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.

16.2 Full text of R-phrases referred to under sections 2 and 3

R22: Harmful if swallowed.

R 37/38: Irritating to respiratory system/skin.

R41: Risk of serious damage to the eyes.

R42/43: May cause sensitization skin contact.

16.3. Full text of P-Statements referred to under sections 2 and 3.

P261: Avoid breathing dust.

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.

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

P335 : Brush off loose particles from skin.

P363 : Wash contaminated clothing before reuse.

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.

P 304+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.

P342+P311: If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.

P405: Store locked up.

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

P501 : Dispose of contents/container according to valid regulations.

16.4. Full text of S-Statements referred to under sections 2 and 3.

S23: Do not breathe dust.



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S24/25: Avoid contact with skin and eyes

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

S37/39: Wear suitable gloves and eye/face protection

S46: If swallowed, seek medical advice immediately and show this container or label

16.5. Explanations for possible abbreviations mentioned in above sections

PBT: Persistent, bioaccumulative and toxic.

vPvB: Very persistent and very bioaccumulative.

ES: Exposure Scenario

WGK: Wassergefährdungsklasse (Water hazard class)

PNEC: Predicted No-Effect Concentration

NOAEC: No Observed Adverse Effect Concentration

ADR: European **Agreement** concerning the International Carriage of **Dangerous** Goods by **Road**

RID: **International** Carriage of **Dangerous** Goods by **Road**

IMDG Code: International Maritime Dangerous Goods Code

ICAO/IATA: International Civil Aviation Organization/ International Air Transport Association.

16.6. Revision: Revision 0

This is the first version of the eSDS of Phthalic anhydride. Hence, no revision information should be mentioned here.

Annex I to SDS- Exposure Scenario

Disclaimer:

Oltchim provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. The information is intended to aid the user in controlling the handling risks; it is not to be construed as a warranty or specification of the product quality.

The information may not be or may not altogether be applicable to combinations of the product with other substances or to particular applications. The user is responsible for ensuring that appropriate precautions are taken and for satisfying themselves that the data are suitable and sufficient for the product's intended purpose. In case of any unclarity we advise consulting the supplier or an expert.



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ANNEX I- EXPOSURE SCENARIO

ES 1: Production of phthalic anhydride

Exposure scenario

Short title of the exposure scenario: Production of phthalic anhydride

Process Categories:

PROC01: Use in closed process, no likelihood of exposure

PROC02: Use in closed, continuous process with occasional controlled exposure

PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC 9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Environmental Release Category:

ERC01: Production of chemicals

Table : Risk management measures for industrial site

Information type	Data field	Explanation
Containment and local exhaust ventilation		
Containment plus good work practice required	Effectiveness: Unknown	Production and handling of molten phthalic anhydride



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Information type	Data field	Explanation
		involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material.
Local exhaust ventilation is not required	Effectiveness : Unknown	Production and handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material.
Personal protective equipment (PPE)		
Type of PPE (gloves, respirator, face-shield etc)	Effectiveness: Unknown	Production and handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material. Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimise exposure and



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Information type	Data field	Explanation
		risks.
Other risk management measures related to workers		
No further risk management measures required		
Risk management measures related to environmental emissions from industrial sites		
Onsite pre-treatment of waste water	Chemical pre-treatment or onsite STP.	Waste waters are generally treated on site by chemical and/or biological methods before release to the municipal STP or to the environment.
Resulting fraction of initially applied amount in waste water released from site to the external sewage system	Varies depending on system. Estimated concentration in the STP effluent is between 2 and 3mg/L based on worst case measured emissions.	Worst case measured production releases are considered below and have been determined to be safe for the environment.
Air emission abatement	Effectiveness: Adequate measures in place	Exhaust gases absorbed in wet scrubbers or removed by incineration. Worst case measured emission values are considered below and are found to be safe for the environment. The emission to air is therefore considered to be negligible.
Resulting fraction of applied amount in waste gas released to environment	43.2 kg/d	Worst case measured values before scrubbing. This value has been inputted into the environmental risk assessment and is determined to be safe for the environment. As such the actual release levels after scrubbing or incineration will pose no threat to the environment.
Onsite waste treatment	Effectiveness: 87.3%	Simpletreat within EUSES assumes 87.3% removal in the STP system. This is considered to be conservative.



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Information type	Data field	Explanation
Effluent (of the waste water treatment plant) discharge rate	2000 m ³ /d	Default: 2.000 m ³ /d
Recovery of sludge for agriculture or horticulture	No	All sludge is collected and incinerated or sent to landfill.
Resulting fraction of initially applied amount in waste water released from site	12.6%	Simpletreat within EUSES assumes 12.6% emission in effluent from the STP system. This is considered to be conservative.

ES 2: Use of phthalic anhydride as an intermediate

Exposure scenario 2 concerns the use of phthalic anhydride as an intermediate by downstream users. The procedures for dealing with the molten material and the flake as an isolated intermediate and in the production will involve very similar procedures to those of production e.g. unloading tankers, piping the molten material to heated storage vessels and/or reactors for use under contained conditions. The processes are computer controlled, with the supervising operators working in dedicated plant control rooms. It is anticipated that the exposure and emission scenarios for these uses will be very similar to production with up to 360 emission days per year. As with ES1 exposure to workers has been determined using ECETOC TRA and environmental exposure levels have been calculated in EUSES.

Exposure scenario

Short title of the exposure scenario: Use of phthalic anhydride as an intermediate

Sectors of Use:

SU3: Industrial uses: Uses of substances as such or in preparation at industrial sites

SU8: Manufacture of bulk, large scale chemicals (including petroleum products)

SU9: Manufacture of fine chemicals

Produce Category:

PC19: Intermediate

Process Categories:

PROC01: Use in closed process, no likelihood of exposure

PROC02: Use in closed, continuous process with occasional controlled exposure

PROC03: Use in closed batch process (synthesis or formulation)

PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises



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PROC08B: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Environmental Release Category:

ERC6A: Industrial use resulting in manufacture of another substance (use of intermediates)

Description of activities and processes covered in the exposure scenario

Table: Risk management measures for industrial site

Information type	Data field	Explanation
Containment and local exhaust ventilation		
Containment plus good work practice required	Effectiveness: Unknown	Handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material.
Local exhaust ventilation is not required is not required to demonstrate a safe use but may be present depending on the design of the premises	Effectiveness : Unknown	Handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material.
Personal protective equipment (PPE)		
Type of PPE (gloves, respirator, face-shield etc)	Effectiveness: Unknown	Handling of molten phthalic anhydride involves high



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Information type	Data field	Explanation
		temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material. Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimise exposure and risks.
Other risk management measures related to workers		
No further risk management measures required		
Risk management measures related to environmental emissions from industrial sites		
Onsite pre-treatment of waste water	Chemical pre-treatment or onsite STP.	Waste waters are generally treated on site by chemical and/or biological methods before release to the municipal STP or to the environment.
Resulting fraction of initially applied amount in waste water released from site to the external sewage system	Varies depending on system. Estimated concentration in the STP effluent is between 2 and 3mg/L based on worst case measured emissions.	Worst case measured releases for the phthalic anhydride life cycle are considered below and have been determined to be safe for the environment.
Air emission abatement	Effectiveness: Adequate measures in place	Exhaust gases absorbed in wet scrubbers or removed by incineration. Worst case measured emission values are considered below and are found to be safe for the environment. The emission to air is therefore considered to be negligible.



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Information type	Data field	Explanation
Resulting fraction of applied amount in waste gas released to environment	43.2 kg/d	Worst case measured values before scrubbing. This value has been inputted into the environmental risk assessment and is determined to be safe for the environment. As such the actual release levels after scrubbing or incineration will pose no threat to the environment.
Onsite waste treatment	Effectiveness: 87.3%	Simpletreat within EUSES assumes 87.3% removal in the STP system. This is considered to be conservative.
Effluent (of the waste water treatment plant) discharge rate	2000 m ³ /d	Default: 2.000 m ³ /d

ES 3: Use of phthalic anhydride as a monomer

Exposure scenario 3 relates to use of phthalic anhydride as a monomer by downstream users. However, the procedures for dealing with the molten material and the flake as a monomer will involve very similar procedures to those of production and use as an intermediate. Therefore it is anticipated that the exposure and emission scenarios for these uses will be very similar to those for production of phthalic anhydride with up to 360 days production emission days per year.

The use of phthalic anhydride as a monomer includes the production of alkyl resins which are manufactured using a polymerization reaction between an alcohol, such as glycerol, and a di carboxylic anhydride (phthalic anhydride). Glycerol and phthalic anhydride react to form the polyester glyptal.

A further example of PA use as a monomer is the manufacturing of polyester polyols. This process is very similar to that one described in the alkyl resins manufacturing. The raw materials are phthalic anhydride and polyhydric alcohols. The polyester obtained is not dissolved in any solvent but is used in the formation of polyurethanes particularly polyurethane elastomers, flexible/semi-rigid polyurethane foams and polyurethane coatings. As with previous exposure scenarios worker exposure has been assessed using ECETOC TRA and environmental exposure has been assessed using EUSES 2.1.



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Exposure scenario

Short title of the exposure scenario: Use of phthalic anhydride as a monomer

Sectors of Use:

SU3: Industrial uses: Uses of substances as such or in preparation at industrial sites

SU10: Formulation [mixing] of preparation and/or re-packaging (excluding alloys)

SU12: Manufacture of plastics products, including compounding and conversion

Produce Category:

PC32: Polymer preparations and compounds

Process Categories:

PROC01: Use in closed process, no likelihood of exposure

PROC02: Use in closed, continuous process with occasional controlled exposure

PROC03: Use in closed batch process (synthesis or formulation)

PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC08B: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Environmental Release Category:

ERC6C: Industrial use of monomers in the production of plastics (polymers).

ERC6D: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers.

Table: Risk management measures for industrial site

Information type	Data field	Explanation
Containment and local exhaust ventilation		
Containment plus good work practice required	Effectiveness: Unknown	Handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material.



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Information type	Data field	Explanation
Local exhaust ventilation is not required is not required to demonstrate a safe use but may be present depending on the design of the premises	Effectiveness : Unknown	Handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material.
Personal protective equipment (PPE)		
Type of PPE (gloves, respirator, face-shield etc)	Effectiveness: Unknown	Handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material. Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimise exposure and risks.
Other risk management measures related to workers		
No further risk management measures required		
Risk management measures related to environmental emissions from industrial sites		
Onsite pre-treatment of waste water	Chemical pre-treatment or onsite STP.	Waste waters are generally treated on site by chemical and/or biological methods before release to the municipal STP or to the environment.



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Information type	Data field	Explanation
Resulting fraction of initially applied amount in waste water released from site to the external sewage system	Varies depending on system. Estimated concentration in the STP effluent is between 2 and 3mg/L based on worst case measured emissions.	Worst case measured releases for the phthalic anhydride life cycle are considered below and have been determined to be safe for the environment.

ES 4: Formulation, mixture, refilling and reloading of phthalic anhydride

Exposure scenario 4 concerns the use of phthalic anhydride during formulation, mixture, refilling and reloading operations. The procedures for dealing with the molten and flake material include reloading tankers, piping the molten material to fill heated storage vessels and transferring to mixers/blenders to formulate preparations. These operations remain under contained conditions. The processes are computer controlled, with the supervising operators working in dedicated plant control rooms. It is anticipated that the exposure and emission scenarios for these formulation, mixture, reloading and mixing operations uses will be very similar to production with up to 360 emission days per year.

The molten form of phthalic anhydride exists at high temperature and as such contains an intrinsic thermal risk that is controlled by a high degree of system closure. The high temperature conditions also need to be maintained in order to allow the material to remain in the molten state so that it can be pumped along sealed pipelines, either for direct mixing/formulation use, or transfer to containers or tankers (which are also heated or insulated to maintain the molten states, in order for the material to be useable for the processes of this ES by the downstream users). The pipelines and any storage vessels are heated and insulated, and are not open to the atmosphere which reduces atmospheric loss from this ES. The vessel and tanker insulation has the dual function of maintaining temperature and preventing worker exposure and release to the environment.

Any small losses of gas from vessels and tankers (from venting for example) can be passed through catalytic incinerators or aqueous scrubbers to remove any phthalic anhydride from the waste gas. Tanker connecting and disconnecting (loading, unloading and reloading) generally takes place in the open air. Respiratory equipment and protective clothing are worn when connecting and disconnecting tankers. Gas displacement lines are also used if filling of road tankers takes place under cover. In the EU 95% of operations take place using the molten form with use of the flaked form only constituting 5%.

Flaking machines and systems are enclosed, with LEV equipment to prevent exposure to dusts from the flaked form. In some cases exhausts loss from the LEV may be fed back to the molten stream, scrubbed or incinerated. LEV would generally function in the same way for mixing, reloading and refilling of containers with the flake. The nature of the phthalic anhydride dictates that high-integrity closed systems are used throughout,



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Exposure scenario

Short title of the exposure scenario: Formulation, mixture, refilling and reloading of phthalic anhydride

Sector of Use:

SU3: Industrial uses: Uses of substances as such or in preparation at industrial sites

SU10: Formulation [mixing] of preparation and/or re-packaging (excluding alloys)

Process Categories:

PROC01: Use in closed process, no likelihood of exposure

PROC02: Use in closed, continuous process with occasional controlled exposure

PROC03: Use in closed batch process (synthesis or formulation)

PROC04: Use in batch and other process (synthesis) where opportunity for exposure arises

PROC05: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)

PROC08b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

PROC09: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)

Environmental Release Category:

ERC02: Formulation of preparations

Table: Risk management measures for industrial site

Information type	Data field	Explanation
Containment and local exhaust ventilation		
Containment plus good work practice required	Effectiveness: Unknown	Handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material.
Local exhaust ventilation is not required is not required to demonstrate a safe use but may	Effectiveness : Unknown	Handling of molten phthalic anhydride involves high temperatures, and high integrity



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with less than 0.05 % maleic anhydride

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Information type	Data field	Explanation
be present depending on the design of the premises		contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material.
Personal protective equipment (PPE)		
Type of PPE (gloves, respirator, face-shield etc)	Effectiveness: Unknown	Handling of molten phthalic anhydride involves high temperatures, and high integrity contained systems with little or no potential for exposure. Pipelines and vessels are sealed and insulated. Workers involved in production work in a control room, with no direct contact to the installations housing the material. Workers involved in sampling and transfer of materials to road tankers are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimise exposure and risks.
Other risk management measures related to workers		
No further risk management measures required		
Risk management measures related to environmental emissions from industrial sites		
Onsite pre-treatment of waste water	Chemical pre-treatment or onsite STP.	Waste waters are generally treated on site by chemical and/or biological methods before release to the municipal STP or to the environment.
Resulting fraction of initially applied amount in waste water released from site to the external	Varies depending on system. Estimated concentration in the STP	Worst case measured releases for the phthalic anhydride life cycle are considered below and



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Information type	Data field	Explanation
sewage system	effluent is between 2 and 3mg/L based on worst case measured emissions.	have been determined to be safe for the environment.
Air emission abatement	Effectiveness: Adequate measures in place	Exhaust gases absorbed in wet scrubbers or removed by incineration. Worst case measured emission values are considered below and are found to be safe for the environment. The emission to air is therefore considered to be negligible.
Resulting fraction of applied amount in waste gas released to environment	43.2 kg/d	Worst case measured values before scrubbing. This value has been inputted into the environmental risk assessment and is determined to be safe for the environment. As such the actual release levels after scrubbing or incineration will pose no threat to the environment.
Onsite waste treatment	Effectiveness: 87.3%	Simpletreat within EUSES assumes 87.3% removal in the STP system. This is considered to be conservative.
Effluent (of the waste water treatment plant) discharge rate	2000 m ³ /d	Default: 2.000 m ³ /d
Recovery of sludge for agriculture or horticulture	None	All sludge is collected and incinerated or sent to landfill.
Resulting fraction of initially applied amount in waste water released from site	12.6%	Simpletreat within EUSES assumes 12.6% emission in effluent from the STP system. This is considered to be overestimated.



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ES 5: Use of phthalic anhydride as a laboratory chemical

Exposure scenario 5 concerns the small scale use of phthalic anhydride as a laboratory chemical. As the majority of laboratories involved would generally not use phthalic anhydride in the molten form (due to not having the specialised systems in place to deal with the molten form of phthalic anhydride) the solid (flaked form) use would generally be most prevalent in the laboratory. The amounts used on each site would generally be very small with less than 1kg per site. As such this exposure scenario can be considered to be wide dispersive with a large number of very small point sources (individual laboratories) throughout the EU being encompassed in this use.

As such the focus of this ES should be on the regional risk as specified by the ECHA "Guidance on information requirements and chemical safety assessment: Chapter R.16: Environmental Exposure Estimation".

As with previous exposure scenarios exposure to workers has been determined using ECETOC TRA and environmental exposure levels have been calculated in EUSES.

Exposure scenario

Short title of the exposure scenario: Use of phthalic anhydride as a laboratory chemical

Sector of Use:

SU22: Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

Process Categories:

PROC15: Use as laboratory reagent

Product Categories:

PC21: Laboratory chemicals

Environmental Release Category:

ERC8A: Wide dispersive indoor use of processing aids in open systems

ERC8B: Wide dispersive indoor use of reactive substances in open systems
Table: Risk management measures for industrial site

Information type	Data field	Explanation
Containment and local exhaust ventilation		
Containment is not required to demonstrate a safe use but may be present depending on the design of the laboratories. Good work practice required	Effectiveness: Unknown	Laboratory workers involved in handling and use of phthalic anhydride are trained in the procedures and protective equipment is intended to cope



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Information type	Data field	Explanation
		with the worst case scenario, in order to minimise exposure and risks.
Local exhaust ventilation is not required to demonstrate a safe use but may be present depending on the design of the laboratories.	Effectiveness : Unknown	Laboratory workers involved in handling and use of phthalic anhydride are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimise exposure and risks.
Personal protective equipment (PPE)		
Type of PPE (gloves, respirator, face-shield etc)	Effectiveness: Unknown	Laboratory workers involved in handling and use of phthalic anhydride are trained in the procedures and protective equipment is intended to cope with the worst case scenario, in order to minimise exposure and risks.
Other risk management measures related to workers		
No further risk management measures required		
Risk management measures related to environmental emissions from laboratories		
Onsite pre-treatment of waste water	Possible on-site treatment	Laboratories may have on site waste treatment, however the quantities used in the laboratory are so small that this may not be required for phthalic anhydride use.
Resulting fraction of initially applied amount in waste water released from site to the external sewage system	Varies depending on system.	This will change depending on the use pattern in the laboratory concerned. The worst case assumed emissions have been considered in tier 1 and found to be safe.
Air emission abatement	Effectiveness: Adequate measures in place	LEV (fume hoods) are generally in place in most laboratories.



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Information type	Data field	Explanation
Resulting fraction of applied amount in waste gas released to environment	88.3 kg/d	Worst case EUSES estimated value (as there is only <1kg on site for each laboratory this value is a vast overestimation.
Onsite waste treatment	Effectiveness: 87.3%	Simpletreat within EUSES assumes 87.3% removal in the STP system. This is considered to be conservative and is applicable to the municipal STP and laboratory use.
Effluent (of the waste water treatment plant) discharge rate	2000 m ³ /d	Default: 2.000 m ³ /d
Recovery of sludge for agriculture or horticulture	None	All sludge is collected and incinerated or sent to landfill.
Resulting fraction of initially applied amount in waste water released from site	12.6%	Simpletreat within EUSES assumes 12.6% emission in effluent from the STP system. This is considered to be overestimated.



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