

Material Safety Data Sheet

according to REG (EC) no. 453/2010

Product identification:

Phthalic anhydride – liquid

printing date: 07.03.2016

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

- 1.1 Product identification:** Phthalic anhydride – index no. 607-009-00-4
(REG (EC) no. 1272/2008, annex VI, part 3)
- 1.1.1. Trade name: Phthalic anhydride – liquid; PA - liquid
- 1.1.2. Registration number: 01-2119457017-41-0019
- 1.1.3. Identified uses: Main User Groups SU 3 / 8 / 9 / 10 / 21 / 22
detailed explanation of SU und other categories of use see section 16
- 1.1.4. Uses not advised to: none

- 1.2 Company / supplier:** ATMOSA Petrochemie GmbH
Danubiastraße 21-25
A-2320 Schwechat
Tel.: +43 1 706 28 49 Fax: +43 1 706 28 49 – 16
Advisory person of the company:
Mr. Dipl.-Ing. Ladislav PIKNA, plant manager
Tel.: +43 1 706 28 49 – 13 Fax: +43 1 706 28 49 – 16
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- 1.3 Emergency telephone:** Tel. Control center PA production plant:
+43 1 706 28 49 – 31
Tel. Intoxication information center:
+43 1 406 43 43

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance / preparation

- 2.1.1. Classification according to regulation (EC) no. 1272/2008, annex VI
- | | |
|--|------|
| Acute toxicity (oral), haz. cat. 4 | H302 |
| Skin corrosion/irritation, haz. cat. 2 | H315 |
| Serious eye damage/eye irritation, haz. cat. 1 | H318 |
| Sensitisation - skin, haz. cat. 1 | H317 |
| Respiratory sensitisation, haz. cat. 1 | H334 |
| Specific target organ toxicity (single exp.): resp. syst., haz. cat. 3 | H335 |

- 2.1.2. Classification according to dir. 67/548/EEC and dir. 1999/45/EC



Xn – harmful
Xi – irritating

R22
R37/38-41 – R42/43

2.2 Labelling elements according to regulation (EC) 1272/2008

pictograms:



GHS05 - corrosion



GHS07 – exclamation



GHS08 – chronic health hazard

signal word:

DANGER

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2.3 Other hazards

2.3.1 PBT and vPvB assessment

The substance / preparation is not to be classified, neither as PBT (**P**ersistent, **B**ioaccumulative, **T**oxic), nor as vPvB (**v**ery **P**ersistent, **v**ery **B**ioaccumulative); for further details see section 12.3.

2.3 Hazard and precautionary statements

H302	Harmful if swallowed
H318	Causes serious eye damage
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335	May cause respiratory irritation
H315	Causes skin irritation
H317	May cause an allergic skin reaction
H226	<i>Flammable liquid and vapour</i>
<hr/>	
P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233	Keep container tightly closed.
P240	Ground/bond container and receiving equipment.
P242	Use only non-sparking tools.
P243	Take precautionary measures against static discharge.
P261	Avoid breathing dust/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 clothing and 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.
P303+P361+P353	IF ON SKIN (or hair): Remove/Take off immediately all contaminated Clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: 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.
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.
P337+P313	If eye irritation persists: Get medical advice / attention.
P362	Take off contaminated clothing and wash before reuse.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up.
P501	Dispose of contents / container in accordance with local regulations.

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3. COMPOSITION / INFORMATION ON INGREDIENTS

				classification acc. to reg. (EC) no. 1272/2008		
substance	EINECS / CAS no.	Index no.	contents	hazard classes and categories	pictograms signal word	hazard statements
Phthalic anhydride	201-607-5 85-44-9	607-009-00-4	> 99,80 % (w/w)	Acute toxicity (oral), haz. cat. 4 Skin corrosion / irritation, haz. cat. 2 Serious eye damage/eye irritation, haz. cat. 1 Sensitisation - skin, haz. cat. 1 Respiratory sensiti- sation, haz. cat. 1 Specific target organ toxicity (single exp.): resp. syst., haz. cat. 3	GHS05 GHS07 GHS08    Danger	H302 H315 H318 H317 H334 H335 H226
				classification and labelling acc. to dir. 67/548/EEC and dir. 1999/45/EC		
				classification	symbol	risk phrases
				Xn – harmful Xi – irritating		R22 R37/38-41 R42/43

4. FIRST AID MEASURES

- **General measures:** Take off with product contaminated clothing immediately; in case of any health disorder get medical advice / attention.
- **Inhalation:** Remove to fresh air; if breathing is difficult, give oxygen, if possible; if victim is unconscious bedding and transport only in recovery position, if indicated apply artificial respiration; get medical advice / attention in case of physical troubles / disorders; in case of irritation of the respiratory system seek medical help / attention.
- **Skin contact:** Immediate cooling with plenty of water; do not remove occurring material deposits (incrustations) on skin by force or with solvents; for treatment of possible burns and gentle cleaning of skin seek medical advice / attention immediately.
- **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 / 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.

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5. FIRE-FIGHTING MEASURES

- **Suitable extinguishing media:** Water spray, carbon dioxide (CO₂), foam, dry (extinguishing) powder.
- **Unsuitable extinguishing media:** Full water jet.
- **Special exposure hazards arising from the substance / preparation itself, combustion products or resulting gases:** In case of fire / combustion dangerous vapours / gases may occur: carbon monoxide (CO), carbon dioxide (CO₂); heavy smoke emission.
- **Special protective measures and equipment for fire-fighters:** Staying in hazard area / fire-fighting only with full turn-out gear and self contained breathing apparatus; cool endangered containers with water spray from out of harm's way; defeat evolving vapours with water; keep quench water away from drains, surface- and ground-water and soil; avoid skin contact by wearing suitable protective clothing and keeping safe distance.
- **Additional information:** With water formation of phthalic acid; quench water may cause corrosion to iron and low-alloy steel; melts above 130°C.

6. ACCIDENTAL RELEASE MEASURES

- **Personal precautions, protective equipment and emergency measures:** 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.
- **Environmental precautions:** Prevent product and large quantities of contaminated washing water from invading surface waters and soil; confine with sand or similar material; let product solidify (freeze); contain product mechanically and collect it in marked vessels; cover drains to prevent product from entering canalisation if necessary.
- **Methods and materials for cleaning up:** Let escaped (leaking) material solidify (freeze), contain it mechanically, e.g. with a clean shovel, and collect it in dedicated, marked, clean and dry vessels for disposal.

7. HANDLING AND STORAGE

- **Precautions for safe handling:** Filling only with devices possessing exhausting systems; adhere to minimal standards according to TGS 500 – which include common hygiene measures such as:
 - ✓ no eating, drinking and smoking in working areas;
 - ✓ wash hands after use;
 - ✓ take off contaminated clothing and protective equipment before entering eating areas.
- **Fire and explosion protection:** Avoid static electricity, e.g. by grounding; keep implicitly away from ignition sources.
- **Special design for storage rooms and vessels/containers:** Store in a cool and well-ventilated room; protect material from humidity; keep always in containers adequate to the genuine storage container; keep containers tightly closed; store apart from pharmaceuticals, food and feeding stuff.

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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Exposure limit values :

Occupational Exposure Limit Values: TLV 1 mg/m³ (TRGS 900)
Peak limit cat. 1
Pregnancy group D

8.2 DNEL and PNEC values

	water	sediment	soil	sewage treatment plant
PNEC	5,6 mg/l	0,0826 mg/kg	0,153 mg/kg	10 mg/l
DNEL	dermal	inhalative	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 controls:

Technical measures and the design of appropriate work processes go before the use of personal protective equipment; apply adequate ventilation – either by local exhausting equipment or by collective drawing-off air. A dust collecting system has to be provided in any case; exhaust air must be treated by a separator / stripper or lead over filters before being released to the environment – in doing so make sure for an uninterrupted equipotential bonding (protective multiple earthing). Wash hands before breaks and after end of work; take off contaminated clothing immediately.

- Respiratory protection: use a fine dust mask at short-term or low exposure; adequate filters e.g. on a full or half mask for long-term or heavy / elevated exposure: composite filter ABEK2-P3.
- Hand protection: wear protective gloves resistant against solvents and acids according to EN 374: nitrile rubber, thickness $\geq 0,40$ mm, breakthrough time > 120 min.
- Eye protection: use safety glasses according to EN 166:2001 (e.g. densely closing frame glasses with side protection); keep an eyewash bottle ready.
- Skin and body protection: protective clothing – the means for body protection have to be chosen depending on specific concentration and quantity of the dangerous substance / preparation at workplace; chemical resistance of protective equipment has to be clarified with the supplier. Workwear and safety shoes should be made of flame resistant and antistatic material (no synthetic fibre).

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	liquid	$> 131^{\circ}\text{C}$	
Colour	transparent		
Odour	aromatic / irritant	threshold n.a.	
pH-Wert	2,0	20°C (6 g/l H ₂ O)	tested
Boiling point / range	$284,5^{\circ}\text{C}$	at 1013 hPa	tested
Melting point	$131,0^{\circ}\text{C}$		tested
Flash point	152°C	acc. to DIN 51758	tested

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Vapour pressure	9,3 mbar	at 135°C	literature
	107,3 mbar	at 200°C	literature
Autoignition temperature	580°C	acc. to DIN 51794	tested
Decomposition temperature	no decomposition		
Explosion limits:			
	lower: 1,7 %		literature
	upper: 10,5 %		literature
Density	1,197 g/cm ³	at 150°C	tested
	1,150 g/cm ³	at 200°C	tested
Viscosity	1,190 mPa*s	at 132°C	Literaturwert
	1,125 mPa*s	at 155°C	Literaturwert
Water solubility	6 g/l	at 20°C	tested
Alcohol solubility	very good	at 20°C monoester formation	tested
Partition coefficient (n-octanol/water - log P _{ow})	0,73 (Phthalic acid)		literature

10. STABILITY AND REACTIVITY

- **Conditions to avoid:** Protect against extreme heat and extreme low temperatures; when hot intense hydrolysis reaction with water
- **Materials to avoid:** oxidising agents (substances)
- **Thermal decomposition:** can be distilled / fractionated at standard (ambient) pressure without decomposition
- **Hazardous decomposition products:** none

11. TOXICOLOGICAL INFORMATION

Toxicological classification of the preparation was done based on results of the overall computational procedure for classification in regulation (EC) no. 1272/2008. Operating experience of the manufacturer shows that no hazards beyond current classification can be expected.

11.1 Acute toxicity

oral LD₅₀ = 1530 mg/kg (rat)
dermal LD₅₀ = > 3160 mg/kg (rabbit)
inhalative LC50 = > 210 mg/m³ air 1 h (rat)

11.2 Specific target organ toxicity

single exposure	effects	target organ	remarks
acute toxicity, inhalative	corrosion / irritation	respiratory system	in case of inhalation of dust / mist / aerosols

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11.3 Corrosive / irritating effects

	exposure period	species	evaluation	methods	remarks
primary corrosive effects on skin	24 h	rabbit	haz. cat. 2 – causes skin irritation; corrosive effects on mucosa	similar to OECD 404	
eye irritation		rabbit	haz. cat. 1 – causes serious eye irritation	similar to OECD 405	

12. ECOLOGICAL INFORMATION

12.1 Ecotoxicity

	dose rate	exposure period		species
acute fish toxicity	LC ₅₀	60 h	4,4 – 48,3 mg/l	onchorhynchus mykiss
acute daphnia toxicity	EC ₁₀			daphnia
acute algae toxicity	EC ₅₀	96 h	60 – 350 mg/l	selenastrum capricornutum resp.
BOD		5 d	44 – 78 %	

12.2 Persistence and degradability – bioaccumulation potential, mobility in soil

- $\log P_{ow} = 0,73$ (Phthalic acid at 20°C)
- BCF < 100
- readily biodegradable

12.3 Results of PBT and vPvB assessment according to annex XIII of REACH regulation

PBT		evaluation
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 toxic

vPvB

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

BCF of phthalic
anhydride < 5000

not enough strong bioaccumulation for
classification

Conclusion:

The substance / preparation is not to be classified, neither as PBT (**P**ersistent, **B**ioaccumulative, **T**oxic), nor as vPvB (**v**ery **P**ersistent, **v**ery **B**ioaccumulative).

13. DISPOSAL CONSIDERATIONS

- Dangerous waste according to „Abfallverzeichnisverordnung“ (AVV) BGBl. II Nr. 570/2003 i.d.g.F.; if recovery and recycling is not possible waste has to be disposed only under consideration of local legal regulations.
- Recommendation: waste code number 07 01 08 (AVV).
- Not allowed to be disposed together with residential / municipal waste; must not attain to drains and canalisation.
- Contaminated package, i.e. discharged, not dry or dry packaging has to be considered as containers with harmful contents which have to be disposed according to local legal regulations.
- Purged, not contaminated packaging can be recycled; recommended cleaning agent: water.

14. TRANSPORT INFORMATION

- **Transportation by road (ADR/RID/GGVSea):**
 - o Classification: 3 – flammable liquid substance
 - o Kehler number: 30
 - o UN number: 3256
 - o Packaging group: III
 - o Identification of the good: ELEVATED TEMPERATUR LIQUID, FLAMMABLE, N.O.S. (Phthalic acid anhydride)
 - o Tunnel restriction code: E
- **Transportation by sea (IMDG-Code/GGVSea):**
 - o IMDG/GGVSea-class: 3.3
 - o UN number: 3256
 - o Packaging group: III
 - o EmS number: F-E,S-D (3-07)
 - o MFAG: 4.2
 - o Technical identifier: ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. (Phthalic acid anhydride)
- **Transportation by air (ICAO-IATA/DGR):**
 - o ICAO/IATA-class: 3
 - o UN/ID number: 3256
 - o Packaging group: III
 - o Technical identifier: ELEVATED TEMPERATURE LIQUID, FLAMMABLE, N.O.S. (Phthalic acid anhydride)
 - o Remark: Forbidden

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15. REGULATORY INFORMATION

15.1 Regulations on safety, health and environmental protection – specific legal regulations for the substance / preparation:

- EU regulations:
 - o Labelling and classification: according to regulation (EC) no. 1272/2008 and regulation (EC) no. 790/2009
 - o Regulation (EC) no. 1907/2006
- National regulations:
 - o Chemikaliengesetz 1996, BGBl. I Nr. 53/1997 i.d.g.F.
 - o Chemikalienverordnung 1999, BGBl. II 81/2000 i.d.g.F.
 - o Gesetz zur Durchführung der REACH-VO, BGBl. I 88/2009 i.d.g.F.

15.2 Chemical Safety Assessment:

The substance was subject to a Chemical Safety Assessment according to article 18 of the REACH regulation. 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

16.1 Identified Uses

Main User Groups

SU 3	Industrial uses: Uses of substances as such or in mixtures at industrial sites
SU 8	Manufacture of chemicals at a bulk, large scale (including petroleum products)
SU 9	Manufacture of fine chemicals
SU 10	Formulation (mixing) of preparations and/or re-packaging
SU 21	Consumer uses
SU 22	Professional uses

Sectors of End-use

SU 5	Manufacture of textiles, leather, fur
SU 7	Printing and reproduction of recorded media
SU 11	Manufacture of rubber products
SU 12	Manufacture of plastics products, including compounding and conversion
SU 19	Building and construction work

16.2 Register of H and P statements / Risk phrases

Hazard statements	H302, H315, H318, H317, H334, H335, H226
Precautionary statements	P210, P233, P261, P264, P270, P271, P272, P280, P285, P301+312, P302+352, P304+340, P305+351+338, P310, P330, P333+313, P342+311, P337+313, P362, P403+233, P405, P501
Risk phrases	R22, R37/38-41, R42/43

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16.2 Literature, data sources and legend

- Biographical reference and data sources
 - o CLP REG (regulation) (EC) no. 1272/2008, last modification by regulation (EC) no. 790/2009
 - o DIR 67/548/EWG, last modification by DIR 2009/2/EC
 - o REG (EC) no. 1907/2006, last modification by REG (EC) Nr. 453/2009
 - o Handbook of Chemistry and Physics, 64th edition, R.C. Weast, M.J. Astle, W. H. Beyer (editors), CRC Press, Inc., Boca Raton, Florida (USA), 1984
 - o Handbook of Environmental Data on Organic Chemicals, 4th edition, K. Verschueren (editor), John Wiley & Sons, Weinheim, New York, 2001
- Internet
 - o <http://www.baua.de>
 - o <http://ecb.jrc.ec.europa.eu/esis/>
 - o <http://www.dguv.de/ifa/de/gestis/stoffdb/index.jsp>
 - o <http://www.chemlin.de/chemie/trgs.htm>
 - o <http://logkow.cisti.nrc.ca>
- Legend
 - o BCF = **B**io**C**oncentration **F**actor
 - o DNEL = **D**erived **N**o **E**ffect **L**evel
 - o PNEC = **P**redicted **N**o **E**ffect **C**oncentration
 - o TLV = **T**hreshold **L**imit **V**alue
 - o TRGS = **T**echnische **R**egeln für **G**efahr**S**toffe
 - o ACGIH = **A**merican **C**onference of **G**overnmental **I**ndustrial **H**ygienists
 - o EN = **E**uropäische **N**orm
 - o EC = **E**uropea **C**ommunity
 - o REACH = **R**egistration, **E**valuation and **A**uthorisation of **C**hemicals
 - o CLP = **C**lassification, **L**abelling and **P**ackaging
 - o LD / LC = **L**etale **D**osis / **L**ethal **C**oncentration
 - o EC = **E**ffective **C**oncentration
 - o BOD = **B**iological **O**xygen **D**emand
 - o OECD = **O**rganization for **E**conomic **C**o-operation and **D**evelopment
 - o QSAR = **Q**uantitative **S**tructure-**A**ctivity **R**elationship
 - o GHS = **G**lobally **H**armonised **S**ystem
 - o ADR = **A**ccord europeen relative au transport international de marchandises **D**angereuses par **R**oute
 - o RID = **R**eglement concernant le transport **I**nternational ferroviaire de marchandises **D**angereuses
 - o GGVSea = **G**efahr**G**ut**V**erordnung **S**ea
 - o N.O.S. = **N**ot **O**therwise **S**pecified
 - o IMDG-Code = **I**nternational **M**aritime **C**ode for **D**angerous **G**oods
 - o EmS = **E**mergency **m**asures on **S**ea
 - o UN = **U**nited **N**ations
 - o ICAO = **I**nternational **C**ivil **A**viation **O**rganization
 - o IATA/DGR= **I**nternational **A**ir **T**ransport **A**ssociation/**D**angerous **G**oods **R**egulations

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Annex

Register of relevant Exposure scenarios (ES) and Risk Management Measures (RMM) out of the CSR (Chemical Safety Report) – the detailed CSR can be provided on request only.

Overview on exposure scenarios and coverage of substance life cycle

ES number	Manufacture	Identified uses			Resulting life cycle stage		Sector of Use (SU)	Preparation Category (PC)	Process category (PROC)	Article category (AC)	Environmental Release Category
		Formulation	End use	Consumer use	Service life (for articles)	Waste stage					
ES 1 Production	Y	n/a	n/a	n/a	n/a	n/a	n.a.	n/a	PROC 1, PROC 2 PROC 8b PROC 9	n/a	ERC 1
ES 2 Intermediate	N	N	Y	N	n/a	n/a	SU 3 SU 8 SU 9	PC 19	PROC 1, PROC 2, PROC 3, PROC 4 PROC 8b, PROC 9	n/a	ERC 6a
ES 3 Monomer	N	N	Y	N	n/a	n/a	SU 3 SU 10 SU 11 SU 12	PC 32	PROC 1, PROC 2, PROC 3, PROC 4, PROC 8b, PROC 9	n/a	ERC 6c, 6d
ES 4 Formulation, mixture, refilling and loading	N	Y	N	N	n/a	n/a	SU 3 SU 10	n/a	PROC 1, PROC 2, PROC 3, PROC 4, PROC 5, PROC 8b, PROC 9	n/a	ERC2
ES 5 Laboratory chemical	N	N	Y	N	n/a	n/a	SU 22	PC 21	PROC 15	n/a	ERC 8A, 8B

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ES 1: Production of phthalic anhydride – CSR 9.1

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

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

Environmental Release Category:

ERC01: Production of chemicals

RMMs and measured values for ES 1 tier 2 assessment.

Description of RMM	Details	Effect taken into account in EUSES	Comments
Measured loss to waste water	20 mg/L	Lowering of concentration in STP effluent to 2.53 mg/L	Worst case measured emission value which covers all facilities over all ESs for phthalic anhydride.
Emission and production days	360 emission/production days per year	Increase emission days by 20%.	Continuous production
Sludge removal	Sludge removed to landfill or incinerated.	Concentration in soil due to sludge spreading set to 0.	No contamination of grassland or agricultural soil.
Measured stack gas emissions	Atmospheric losses of 1.8kg/hour.	Emission to the air of 43.2 kg/day.	Worst case emissions prior to scrubbing or incineration. Thus actual emissions to the environment will be even lower.

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ES 2: Use of phthalic anhydride as an intermediate – CSR 9.2

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

Product 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

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:

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

RMMs 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 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

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Information type	Data field	Explanation
		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.
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.

RMMs and measured values for ES 2 tier 2 assessment – see also ES 1

Description of RMM	Details	Effect taken into account in EUSES	Comments
Measured loss to waste water	20 mg/L	Lowering of concentration in STP effluent to 2.53 mg/L	Worst case measured emission value which covers all facilities over all ESs for phthalic anhydride.
Emission and production days	360 emission days per year	Increase emission days by 20%.	Continuous intermediate use
Sludge removal	Sludge removed to landfill or incinerated.	Concentration in soil due to sludge spreading set to 0.	No contamination of grassland or agricultural soil.
Measured stack gas emissions	Atmospheric losses of 1.8kg/hour.	Emission to the air of 43.2 kg/day.	Worst case emissions prior to scrubbing or incineration. Thus actual emissions to the environment will be even lower. This emission value covers all facilities over all ESs for phthalic anhydride as it is worst case for all facilities considered.

Material Safety Data Sheet

according to REG (EC) no. 453/2010

Product identification:

Phthalic anhydride – liquid

printing date: 07.03.2016

ES 3: Use of phthalic anhydride as a monomer – CSR 9.3

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

Product 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

PROC09: 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.

RMMs for industrial site – see ES 2

RMMs and measured values for ES 3 tier 2 assessment – see ES 2

ES 4: Formulation, mixture, refilling and reloading of phthalic anhydride – CSR 9.4

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)

Material Safety Data Sheet

according to REG (EC) no. 453/2010

Product identification:

Phthalic anhydride – liquid

printing date: 07.03.2016

Environmental Release Category:

ERC02: Formulation of preparations

RMMs for industrial site – see ES 2

RMMs and measured values for ES 3 tier 2 assessment – see ES 2

ES 5: Use of phthalic anhydride as a laboratory chemical - CSR 9.5

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

RMMs for industrial site – see ES 2

RMMs and measured values for ES 3 tier 2 assessment – see ES 2