# ARADUR® HY 918-1 CH

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|---|---|---|---|
| 1.5 | 30.11.2022 | 400001011519 | Date of first issue: 06.01.2016 |

Print Date 11.12.2023

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

| | | |
|---|---|---|
| Trade name | : | ARADUR® HY 918-1 CH |
| REACH Registration Number | : | 01-2119488054-36-0001 |
| Substance name | : | methyl-tetrahydrophthalic anhydride |
| CAS-No. | : | 11070-44-3 |
| Index-No. | : | 607-240-00-0 |
| EC-No. | : | 234-290-7 |

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

| | | |
|---|---|---|
| Use of the Substance/Mixture | : | Component used for the manufacture of electrical insulation parts |

ES1: Formulation of preparations Industrial
ES2: Formulation in materials Industrial
ES3: Industrial use resulting in inclusion into or onto a matrix Industrial
ES4: Used as chemical intermediate Industrial
ES5: Industrial use of reactive processing aids Industrial
ES6: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers Industrial

| | | |
|---|---|---|
| Recommended restrictions on use | : | For industrial use only. |

### 1.3 Details of the supplier of the safety data sheet

| | | |
|---|---|---|
| Company | : | Huntsman Advanced Materials (Europe)BVBA |
| Address | : | Everslaan 45<br>3078 Everberg<br>Belgium |
| Telephone | : | +41 61 299 20 41 |
| Telefax | : | +41 61 299 20 40 |
| E-mail address of person responsible for the SDS | : | Global_Product_EHS_AdMat@huntsman.com |

### 1.4 Emergency telephone number

| | | |
|---|---|---|
| Emergency telephone number | : | Centres Antipoison et de Toxicovigilance:<br>ANGERS: 02 41 48 21 21<br>BORDEAUX: 05 56 96 40 80<br>LILLE: 0 825 812 822<br>LYON: 04 72 11 69 11<br>MARSEILLE 04 91 75 25 25<br>NANCY: 03 83 32 36 36<br>PARIS: 01 40 05 48 48<br>RENNES: 02 99 59 22 22<br>STRASBOURG: 03 88 37 37 37 |

TOULOUSE: 05 61 77 74 47
EUROPE: +32 35 75 1234
France ORFILA: +33(0)145425959
ASIA: +65 6336-6011
China: +86 20 39377888
+86 532 83889090
India: + 91 22 42 87 5333
Australia: 1800 786 152
New Zealand: 0800 767 437
USA: +1 800-424-9300

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

**Classification (REGULATION (EC) No 1272/2008)**

| | |
|---|---|
| Serious eye damage, Category 1 | H318: Causes serious eye damage. |
| Respiratory sensitisation, Category 1 | H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled. |
| Skin sensitisation, Category 1 | H317: May cause an allergic skin reaction. |

### 2.2 Label elements

**Labelling (REGULATION (EC) No 1272/2008)**

Hazard pictograms :

Signal word : Danger

Hazard statements :
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Precautionary statements :

**Prevention:**

P261 Avoid breathing mist or vapours.
P280 Wear protective gloves/ eye protection/ face protection.
P284 Wear respiratory protection.

**Response:**

P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER/ doctor.

### 2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Substance name : methyl-tetrahydrophthalic anhydride

Index-No. : 607-240-00-0

EC-No. : 234-290-7

**Hazardous components**

| Chemical name | CAS-No.<br>EC-No. | Concentration (% w/w) | M-Factor, SCL, ATE |
|---|---|---|---|
| tetrahydromethylphthalic anhydride | 11070-44-3<br>234-290-7 | >= 90 - <= 100 | |

## SECTION 4: First aid measures

### 4.1 Description of first aid measures

General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

| | | |
|---|---|---|
| If inhaled | : | Call a physician or poison control centre immediately.<br>If inhaled, remove to fresh air.<br>Get medical attention if symptoms occur. |
| In case of skin contact | : | If skin irritation persists, call a physician.<br>If on skin, rinse well with water.<br>If on clothes, remove clothes. |
| In case of eye contact | : | Small amounts splashed into eyes can cause irreversible tissue damage and blindness.<br>In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.<br>Continue rinsing eyes during transport to hospital.<br>Remove contact lenses.<br>Keep eye wide open while rinsing.<br>If eye irritation persists, consult a specialist. |
| If swallowed | : | Keep respiratory tract clear.<br>Never give anything by mouth to an unconscious person.<br>If symptoms persist, call a physician.<br>Take victim immediately to hospital. |

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

None known.

### 4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically.

## SECTION 5: Firefighting measures

### 5.1 Extinguishing media

| | | |
|---|---|---|
| Suitable extinguishing media | : | Water spray<br>Alcohol-resistant foam<br>Carbon dioxide (CO2)<br>Dry chemical |
| Unsuitable extinguishing media | : | Exercise caution when using a high volume water jet as it may scatter and spread fire |

### 5.2 Special hazards arising from the substance or mixture

| | | |
|---|---|---|
| Specific hazards during firefighting | : | Do not allow run-off from fire fighting to enter drains or water courses. |
| Hazardous combustion products | : | No hazardous combustion products are known |

### 5.3 Advice for firefighters

| | | |
|---|---|---|
| Special protective equipment for firefighters | : | Wear self-contained breathing apparatus for firefighting if necessary. |

| | | |
|---|---|---|
| Specific extinguishing methods | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. |
| Further information | : | Collect contaminated fire extinguishing water separately. This must not be discharged into drains.<br>Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. |

## SECTION 6: Accidental release measures

### 6.1 Personal precautions, protective equipment and emergency procedures

| | | |
|---|---|---|
| Personal precautions | : | Use personal protective equipment.<br>Ensure adequate ventilation.<br>Refer to protective measures listed in sections 7 and 8. |

### 6.2 Environmental precautions

| | | |
|---|---|---|
| Environmental precautions | : | Prevent product from entering drains.<br>Prevent further leakage or spillage if safe to do so.<br>If the product contaminates rivers and lakes or drains inform respective authorities. |

### 6.3 Methods and material for containment and cleaning up

| | | |
|---|---|---|
| Methods for cleaning up | : | Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).<br>Keep in suitable, closed containers for disposal. |

### 6.4 Reference to other sections

For disposal considerations see section 13., See Section 1 for emergency contact information., For personal protection see section 8.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

| | | |
|---|---|---|
| Technical measures | : | Ensure that eyewash stations and safety showers are close to the workstation location. |
| Local/Total ventilation | : | Ensure adequate ventilation. |
| Advice on safe handling | : | Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.<br>Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.<br>Do not breathe vapours/dust.<br>Avoid exposure - obtain special instructions before use.<br>Avoid contact with skin and eyes.<br>For personal protection see section 8.<br>Smoking, eating and drinking should be prohibited in the application area. |

To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Hygiene measures : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

### 7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Keep in properly labelled containers.

Advice on common storage : For incompatible materials please refer to Section 10 of this SDS.

Further information on storage stability : Stable under normal conditions.

Recommended storage temperature : 2 - 40 °C

### 7.3 Specific end use(s)

Specific use(s) : See Annex to the Safety data sheet for additional information in the Exposure Scenario(s).

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

Contains no substances with occupational exposure limit values.

**Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:**

| Substance name | Environmental Compartment | Value |
|---|---|---|
| tetrahydromethylphthalic anhydride | Fresh water | 2 mg/l |
| | Remarks:Assessment Factors | |
| | Marine water | 0,2 mg/l |
| | Remarks:Assessment Factors | |
| | Intermittent use/release | 0,79 mg/l |
| | Remarks:Assessment Factors | |
| | Fresh water sediment | 46,6 mg/kg |
| | Remarks:Equilibrium method | |
| | Marine sediment | 4,66 mg/kg |
| | Remarks:Equilibrium method | |
| | Sewage treatment plant | 0,699 mg/l |

| | | |
|---|---|---|
| | Remarks:Assessment Factors | |
| | Soil | 11,5 mg/kg |
| | Remarks:Equilibrium method | |
| tetrahydromethylphthalic anhydride | Fresh water | 2 mg/l |
| | Remarks:Assessment Factors | |
| | Marine water | 0,2 mg/l |
| | Remarks:Assessment Factors | |
| | Intermittent use/release | 0,79 mg/l |
| | Remarks:Assessment Factors | |
| | Fresh water sediment | 46,6 mg/kg |
| | Remarks:Equilibrium method | |
| | Marine sediment | 4,66 mg/kg |
| | Remarks:Equilibrium method | |
| | Sewage treatment plant | 0,699 mg/l |
| | Remarks:Assessment Factors | |
| | Soil | 11,5 mg/kg |
| | Remarks:Equilibrium method | |

### 8.2 Exposure controls

**Personal protective equipment**

Eye/face protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Hand protection
Material : butyl-rubber
Break through time : > 8 h

Material : Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time : > 8 h

Material : Nitrile rubber
Break through time : > 8 h

Material : Neoprene
Break through time : 10 - 480 min

Remarks : The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines
Equipment should conform to EN 14387

| | | |
|---|---|---|
| Filter type | : | Combined particulates and organic vapour type (A-P) |
| Protective measures | : | Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.<br><br>See Annex to the Safety data sheet for additional information in the Exposure Scenario(s). |

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

| | | |
|---|---|---|
| Physical state | : | liquid |
| Colour | : | No data is available on the product itself. |
| Odour | : | slight |
| Odour Threshold | : | No data is available on the product itself. |
| pH | : | No data is available on the product itself. |
| Melting point/freezing point | : | No data is available on the product itself. |
| Boiling point | : | > 200 °C |
| Flash point | : | > 100 °C<br>Method: Pensky-Martens closed cup |
| Flammability (solid, gas) | : | No data is available on the product itself. |
| Upper explosion limit / Upper flammability limit | : | No data is available on the product itself. |
| Lower explosion limit / Lower flammability limit | : | No data is available on the product itself. |
| Vapour pressure | : | No data is available on the product itself. |
| Relative vapour density | : | No data is available on the product itself. |
| Relative density | : | No data is available on the product itself. |
| Density | : | 1,18 - 1,24 g/cm3 (25 °C) |
| Solubility(ies) | | |
| Water solubility | : | partly soluble (20 °C) |
| Solubility in other solvents | : | No data is available on the product itself. |
| Partition coefficient: n-octanol/water | : | No data is available on the product itself. |

| | | |
|---|---|---|
| Auto-ignition temperature | : | No data is available on the product itself. |
| Decomposition temperature | : | > 200 °C |
| Viscosity | : | No data is available on the product itself. |

**9.2 Other information**

No data available

## SECTION 10: Stability and reactivity

**10.1 Reactivity**

No dangerous reaction known under conditions of normal use.

**10.2 Chemical stability**

Stable under normal conditions.

**10.3 Possibility of hazardous reactions**

| | | |
|---|---|---|
| Hazardous reactions | : | No hazards to be specially mentioned. |

**10.4 Conditions to avoid**

| | | |
|---|---|---|
| Conditions to avoid | : | None known. |

**10.5 Incompatible materials**

| | | |
|---|---|---|
| Materials to avoid | : | Strong acids and strong bases<br>Strong oxidizing agents |

**10.6 Hazardous decomposition products**

Carbon oxides
Burning produces noxious and toxic fumes.

## SECTION 11: Toxicological information

**11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008**

**Acute toxicity**

**Product:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 (Rat): > 2 000 mg/kg |

**Components:**

**tetrahydromethylphthalic anhydride:**

| | | |
|---|---|---|
| Acute oral toxicity | : | LD50 (Rat, male and female): > 2 000 mg/kg<br>Method: OECD Test Guideline 401<br>Assessment: The substance or mixture has no acute oral toxicity |
| Acute dermal toxicity | : | LD50 (Rat, male and female): > 2 000 mg/kg<br>Method: OECD Test Guideline 402 |

Assessment: The substance or mixture has no acute dermal toxicity

**Skin corrosion/irritation**

**Components:**

**tetrahydromethylphthalic anhydride:**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Assessment | : | Mild skin irritant |
| Method | : | OPPTS 870.2500 |
| Result | : | slight irritation |

**Serious eye damage/eye irritation**

**Components:**

**tetrahydromethylphthalic anhydride:**

| | | |
|---|---|---|
| Species | : | Rabbit |
| Method | : | OECD Test Guideline 405 |
| Result | : | Corrosive |

**Respiratory or skin sensitisation**

**Components:**

**tetrahydromethylphthalic anhydride:**

| | | |
|---|---|---|
| Exposure routes | : | Respiratory Tract |
| Species | : | Humans |
| Result | : | May cause sensitisation by inhalation. |
| Result | : | May cause sensitisation by skin contact. |

**Germ cell mutagenicity**

No data available

**Carcinogenicity**

No data available

**Reproductive toxicity**

No data available

**STOT - single exposure**

No data available

**STOT - repeated exposure**

No data available

**Repeated dose toxicity**

No data available

**Aspiration toxicity**

No data available

### 11.2 Information on other hazards

**Endocrine disrupting properties**

**Product:**

Assessment : The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

**Experience with human exposure**

No data available

**Toxicology, Metabolism, Distribution**

No data available

**Neurological effects**

No data available

**Further information**

No data available

## SECTION 12: Ecological information

### 12.1 Toxicity

**Components:**

**tetrahydromethylphthalic anhydride:**

Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): > 100 mg/l
Exposure time: 96 h
Test Type: flow-through test
Test substance: Fresh water
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 130 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EgC50 (Selenastrum capricornutum (green algae)): 68 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to microorganisms : IC20 : 9,33 mg/l
Exposure time: 3 h
Test Type: flow-through test
Test substance: Fresh water
Method: OECD Test Guideline 209

Toxicity to fish (Chronic toxicity) : NOEC: 100 mg/l
Exposure time: 14 d

Species: Oryzias latipes (Orange-red killifish)
Test Type: flow-through test
Test substance: Fresh water
Method: OECD Test Guideline 204

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 20 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

### 12.2 Persistence and degradability

**Components:**

**tetrahydromethylphthalic anhydride:**

Biodegradability : Inoculum: activated sludge
Concentration: 100 mg/l
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301C

Stability in water : Degradation half life (DT50): 3,3 min (20 °C)
pH: 4
Method: OECD Test Guideline 111
Remarks: Fresh water

### 12.3 Bioaccumulative potential

**Components:**

**tetrahydromethylphthalic anhydride:**

Bioaccumulation : Bioconcentration factor (BCF): 3,16

Partition coefficient: n-octanol/water : log Pow: 2,38 - 2,51 (25 °C)
pH: 6
Method: QSAR

### 12.4 Mobility in soil

No data available

### 12.5 Results of PBT and vPvB assessment

**Product:**

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

### 12.6 Endocrine disrupting properties

**Product:**

Assessment : The substance/mixture does not contain components

considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

### 12.7 Other adverse effects

No data available

## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

| | | |
|---|---|---|
| Product | : | Dispose of contents and container in accordance with all local, regional, national and international regulations.<br>Do not dispose of waste into sewer.<br>Do not contaminate ponds, waterways or ditches with chemical or used container. |
| Contaminated packaging | : | Empty remaining contents.<br>Dispose of as unused product.<br>Do not re-use empty containers. |

## SECTION 14: Transport information

### 14.1 UN number or ID number

| | | |
|---|---|---|
| **UNRTDG** | : | Not regulated as dangerous goods |
| **ADN** | : | Not regulated as dangerous goods |
| **ADR** | : | Not regulated as dangerous goods |
| **RID** | : | Not regulated as dangerous goods |
| **IMDG** | : | Not regulated as dangerous goods |
| **IATA** | : | Not regulated as dangerous goods |

### 14.2 UN proper shipping name

| | | |
|---|---|---|
| **UNRTDG** | : | Not regulated as dangerous goods |
| **ADN** | : | Not regulated as dangerous goods |
| **ADR** | : | Not regulated as dangerous goods |
| **RID** | : | Not regulated as dangerous goods |
| **IMDG** | : | Not regulated as dangerous goods |
| **IATA** | : | Not regulated as dangerous goods |

### 14.3 Transport hazard class(es)

| | | |
|---|---|---|
| **ADN** | : | Not regulated as dangerous goods |
| **ADR** | : | Not regulated as dangerous goods |
| **RID** | : | Not regulated as dangerous goods |
| **IMDG** | : | Not regulated as dangerous goods |

| | | |
|---|---|---|
| **IATA** | : | Not regulated as dangerous goods |

**14.4 Packing group**

| | | |
|---|---|---|
| **ADN** | : | Not regulated as dangerous goods |
| **ADR** | : | Not regulated as dangerous goods |
| **RID** | : | Not regulated as dangerous goods |
| **IMDG** | : | Not regulated as dangerous goods |
| **IATA (Cargo)** | : | Not regulated as dangerous goods |
| **IATA (Passenger)** | : | Not regulated as dangerous goods |

**14.5 Environmental hazards**

Not regulated as dangerous goods

**14.6 Special precautions for user**

| | | |
|---|---|---|
| Remarks | : | Not classified as dangerous in the meaning of transport regulations. |

**14.7 Maritime transport in bulk according to IMO instruments**

Not applicable for product as supplied.

## SECTION 15: Regulatory information

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

| | | |
|---|---|---|
| REACH - List of substances subject to authorisation (Annex XIV) | : | Not applicable |
| REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). | : | This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57). |
| REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII) | : | Conditions of restriction for the following entries should be considered:<br>Number on list 3 |
| Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances. | | Not applicable |
| Occupational Illnesses (R-461-3, France) | : | Not applicable |

Other regulations:

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

**The components of this product are reported in the following inventories:**

| | | |
|---|---|---|
| DSL | : | All components of this product are on the Canadian DSL |
| AIIC | : | On the inventory, or in compliance with the inventory |
| ENCS | : | On the inventory, or in compliance with the inventory |
| KECI | : | On the inventory, or in compliance with the inventory |
| PICCS | : | On the inventory, or in compliance with the inventory |
| IECSC | : | On the inventory, or in compliance with the inventory |
| TCSI | : | On the inventory, or in compliance with the inventory |
| TSCA | : | All substances listed as active on the TSCA inventory |

**Inventories**

AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

### 15.2 Chemical safety assessment

For further information see eSDS.

## SECTION 16: Other information

**Further information**

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.



NO PERSON OR ORGANIZATION EXCEPT A DULY AUTHORIZED HUNTSMAN EMPLOYEE IS AUTHORIZED TO PROVIDE OR MAKE AVAILABLE DATA SHEETS FOR HUNTSMAN PRODUCTS. DATA SHEETS FROM UNAUTHORIZED SOURCES MAY CONTAIN INFORMATION THAT IS NO LONGER CURRENT OR ACCURATE.

**Annex to the Safety Data Sheet (eSDS)**

| | |
|---|---|
| **ES 1** | Formulation of preparations Industrial |
| **ES 2** | Formulation in materials Industrial |
| **ES 3** | Industrial use resulting in inclusion into or onto a matrix Industrial |
| **ES 4** | Used as chemical intermediate Industrial |
| **ES 5** | Industrial use of reactive processing aids Industrial |
| **ES 6** | Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers Industrial |

## ES 1: Formulation of preparations.

### 1.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Formulation of preparations |
| **Substance** | : | tetrahydromethylphthalic anhydrideEC-No.: 234-290-7<br>Registration number:<br>01-2119488054-36 |

| | | |
|---|---|---|
| **Environment** | | |
| **CS 1** | **Formulation of preparations** | ERC2 |
| **Worker** | | |
| **CS 2** | **Formulation** | PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC15 |

### 1.2. Conditions of use affecting exposure

#### 1.2.1. Control of environmental exposure: Formulation into mixture (ERC2)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Physical form of product | : | Liquid |
| **Amount used (or contained in articles), frequency and duration of use/exposure** | | |
| Annual site tonnage | : | 1000 t |
| Daily amount per site | : | 10000 kg |
| Emission days | : | 100 |
| **Technical and organisational conditions and measures** | | |
| No discharge of substance into waste water<br>Municipal sewage treatment is not assumed. | | |
| **Conditions and measures related to sewage treatment plant** | | |
| STP type | : | none |

| **Conditions and measures related to treatment of waste (including article waste)** | | |
|---|---|---|
| Waste treatment | : | Liquid and/or solid waste is treated by incineration. |

| **Other conditions affecting environmental exposure** | | |
|---|---|---|
| Receiving surface water flow | : | 18 000 m3/d |
| Local freshwater dilution factor | : | 10 |
| Local marine water dilution factor | : | 100 |

**1.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15)**

| **Product (article) characteristics** | | |
|---|---|---|
| Covers concentrations up to 100 % | | |
| Physical form of product | : | Liquid<br>Low volatile liquid |

| **Technical and organisational conditions and measures** |
|---|
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Assumes a good basic standard of occupational hygiene is implemented<br>Ensure control measures are regularly inspected and maintained.<br>Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.<br>Ensure safe systems of work or equivalent arrangements are in place to manage risks.<br>Ensure there is no direct skin contact with product.<br>Identify potential areas for indirect skin contact.<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.<br>When not in use, keep containers tightly closed. |

| **Conditions and measures related to personal protection, hygiene and health evaluation** |
|---|
| Use suitable eye protection. |
| Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. |
| Wear an impervious suit. |
| Wear suitable respiratory protection. |
| For further specification, refer to section 8 of the SDS. |

| **Other conditions affecting workers exposure** | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Professional or industrial settings | : | Industrial use |

## 1.3. Exposure estimation and reference to its source

### 1.3.1. Environmental release and exposure: Formulation into mixture (ERC2)

| Release route | Release rate | Release estimation method |
|---|---|---|
| Water | 0 % | |
| Air | 2,5 % | |
| Soil | 0,01 % | |

| Protection Target | Exposure estimate | RCR |
|---|---|---|
| Freshwater | < 0,001µg/L (EASY TRA v4.1) | 9,35 E-7 |
| Freshwater sediment | 0,044µg/kg dry weight (EASY TRA v4.1) | 9,34 E-7 |
| Marine water | < 0,001µg/L (EASY TRA v4.1) | 9,02 E-7 |
| Marine sediment | < 0,001µg/kg dry weight (EASY TRA v4.1) | 9,01 E-7 |
| Soil | < 0,001µg/kg dry weight (EASY TRA v4.1) | 0,003511 |

### 1.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15)

| **Additional information on exposure estimation** |
|---|
| No exposure assessment presented for human health.<br>Risk management measures are based on qualitative risk characterisation. |

### 1.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Wastewater emission controls are not applicable as there is no direct release to wastewater.

## ES 2: Formulation in materials

### 2.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Formulation in materials |
| **Substance** | : | tetrahydromethylphthalic anhydrideEC-No.: 234-290-7<br>Registration number:<br>01-2119488054-36 |

| | | |
|---|---|---|
| **Environment** | | |
| **CS 1** | **Formulation in materials** | ERC3 |
| **Worker** | | |
| **CS 2** | **Formulation** | PROC1,<br>PROC2,<br>PROC3,<br>PROC4,<br>PROC5,<br>PROC8a,<br>PROC8b,<br>PROC9,<br>PROC15 |

### 2.2. Conditions of use affecting exposure

#### 2.2.1. Control of environmental exposure: Formulation into solid matrix (ERC3)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Physical form of product | : | Liquid |
| **Amount used (or contained in articles), frequency and duration of use/exposure** | | |
| Annual site tonnage | : | 1000 t |
| Daily amount per site | : | 10000 kg |
| Emission days | : | 100 |
| **Technical and organisational conditions and measures** | | |
| Municipal sewage treatment plant is assumed. | | |
| **Conditions and measures related to sewage treatment plant** | | |
| STP type | : | Municipal Sewage Treatment Plant |
| **Conditions and measures related to treatment of waste (including article waste)** | | |

| | | |
|---|---|---|
| Waste treatment | : | Liquid and/or solid waste is treated by incineration. |
| **Other conditions affecting environmental exposure** | | |
| Receiving surface water flow | : | 18 000 m3/d |
| Local freshwater dilution factor | : | 10 |
| Local marine water dilution factor | : | 100 |

**2.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15)**

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Covers concentrations up to 100 % | | |
| Physical form of product | : | Liquid<br>Low volatile liquid |
| **Technical and organisational conditions and measures** | | |
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). | | |
| Assumes a good basic standard of occupational hygiene is implemented<br>Ensure control measures are regularly inspected and maintained.<br>Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.<br>Ensure safe systems of work or equivalent arrangements are in place to manage risks.<br>Ensure there is no direct skin contact with product.<br>Identify potential areas for indirect skin contact.<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.<br>When not in use, keep containers tightly closed. | | |
| **Conditions and measures related to personal protection, hygiene and health evaluation** | | |
| Use suitable eye protection. | | |
| Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. | | |
| Wear an impervious suit. | | |
| Wear suitable respiratory protection. | | |
| For further specification, refer to section 8 of the SDS. | | |
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |

| | | |
|---|---|---|
| Professional or industrial settings | : | Industrial use |

## 2.3. Exposure estimation and reference to its source

### 2.3.1. Environmental release and exposure: Formulation into solid matrix (ERC3)

| Release route | Release rate | Release estimation method |
|---|---|---|
| Water | 0,2 % | |
| Air | 30 % | |
| Soil | 0,1 % | |

| Protection Target | Exposure estimate | RCR |
|---|---|---|
| Freshwater | 0,05mg/L (EASY TRA v4.1) | 0,025 |
| Freshwater sediment | 1,166mg/kg dry weight (EASY TRA v4.1) | 0,025 |
| Marine water | 0,005mg/L (EASY TRA v4.1) | 0,025 |
| Marine sediment | 0,116mg/kg dry weight (EASY TRA v4.1) | 0,025 |
| Sewage treatment plant | 0,501mg/L (EASY TRA v4.1) | 0,717 |
| Soil | 2,026mg/kg dry weight (EASY TRA v4.1) | 0,176 |

### 2.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Use as laboratory reagent (PROC15)

| Additional information on exposure estimation |
|---|
| No exposure assessment presented for human health.<br>Risk management measures are based on qualitative risk characterisation. |

### 2.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.

Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.

## ES 3: Industrial use resulting in inclusion into or onto a matrix

### 3.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Industrial use resulting in inclusion into or onto a matrix |
| **Substance** | : | tetrahydromethylphthalic anhydrideEC-No.: 234-290-7<br>Registration number:<br>01-2119488054-36 |

| | | |
|---|---|---|
| **Environment** | | |
| **CS 1** | **Industrial use resulting in inclusion into or onto a matrix** | ERC5 |
| **Worker** | | |
| **CS 2** | **Industrial use** | PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC15 |

### 3.2. Conditions of use affecting exposure

#### 3.2.1. Control of environmental exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Physical form of product | : | Liquid |
| **Amount used (or contained in articles), frequency and duration of use/exposure** | | |
| Annual site tonnage | : | 1000 t |
| Daily amount per site | : | 5000 kg |
| Emission days | : | 20 |
| **Technical and organisational conditions and measures** | | |
| Municipal sewage treatment is not assumed.<br>No discharge of substance into waste water | | |
| **Conditions and measures related to sewage treatment plant** | | |

| | | |
|---|---|---|
| STP type | : | none |

| **Conditions and measures related to treatment of waste (including article waste)** | | |
|---|---|---|
| Waste treatment | : | Liquid and/or solid waste is treated by incineration. |

| **Other conditions affecting environmental exposure** | | |
|---|---|---|
| Receiving surface water flow | : | 18 000 m3/d |
| Local freshwater dilution factor | : | 10 |
| Local marine water dilution factor | : | 100 |

**3.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Use as laboratory reagent (PROC15)**

| **Product (article) characteristics** | | |
|---|---|---|
| Covers concentrations up to 100 % | | |
| Physical form of product | : | Liquid<br>Low volatile liquid |

| **Technical and organisational conditions and measures** |
|---|
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Assumes a good basic standard of occupational hygiene is implemented<br>Ensure control measures are regularly inspected and maintained.<br>Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.<br>Ensure safe systems of work or equivalent arrangements are in place to manage risks.<br>Ensure there is no direct skin contact with product.<br>Identify potential areas for indirect skin contact.<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.<br>When not in use, keep containers tightly closed. |

| **Conditions and measures related to personal protection, hygiene and health evaluation** |
|---|
| Use suitable eye protection. |
| Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. |
| Wear an impervious suit. |
| Wear suitable respiratory protection. |

| For further specification, refer to section 8 of the SDS. | | |
|---|---|---|
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Professional or industrial settings | : | Industrial use |

## 3.3. Exposure estimation and reference to its source

### 3.3.1. Environmental release and exposure: Use at industrial site leading to inclusion into/onto article (ERC5)

| Release route | Release rate | Release estimation method |
|---|---|---|
| Water | 0 % | |
| Air | 50 % | |
| Soil | 1 % | |

| Protection Target | Exposure estimate | RCR |
|---|---|---|
| Freshwater | < 0,001µg/L (EASY TRA v4.1) | < 0,001 |
| Freshwater sediment | < 0,001µg/kg dry weight (EASY TRA v4.1) | < 0,001 |
| Marine water | < 0,001µg/L (EASY TRA v4.1) | < 0,001 |
| Marine sediment | 0,044µg/kg dry weight (EASY TRA v4.1) | < 0,001 |
| Soil | 0,807mg/kg dry weight (EASY TRA v4.1) | 0,07 |

### 3.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Use as laboratory reagent (PROC15)

| Additional information on exposure estimation |
|---|
| No exposure assessment presented for human health.<br>Risk management measures are based on qualitative risk characterisation. |

**3.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**
Wastewater emission controls are not applicable as there is no direct release to wastewater.

## ES 4: Used as chemical intermediate

### 4.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Used as chemical intermediate |
| **Substance** | : | tetrahydromethylphthalic anhydrideEC-No.: 234-290-7<br>Registration number:<br>01-2119488054-36 |

| | | |
|---|---|---|
| **Environment** | | |
| **CS 1** | **Used as chemical intermediate** | ERC6a |
| **Worker** | | |
| **CS 2** | **Industrial use** | PROC1,<br>PROC2,<br>PROC3,<br>PROC4,<br>PROC5,<br>PROC8a,<br>PROC8b,<br>PROC9,<br>PROC10,<br>PROC13,<br>PROC15 |

### 4.2. Conditions of use affecting exposure

#### 4.2.1. Control of environmental exposure: Use of intermediate (ERC6a)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Physical form of product | : | Liquid |
| **Amount used (or contained in articles), frequency and duration of use/exposure** | | |
| Annual site tonnage | : | 1000 t |
| Daily amount per site | : | 50000 kg |
| Emission days | : | 20 |
| **Technical and organisational conditions and measures** | | |
| Municipal sewage treatment is not assumed.<br>No discharge of substance into waste water | | |
| **Conditions and measures related to sewage treatment plant** | | |

| | | |
|---|---|---|
| STP type | : | none |

| **Conditions and measures related to treatment of waste (including article waste)** | | |
|---|---|---|
| Waste treatment | : | Liquid and/or solid waste is treated by incineration. |

| **Other conditions affecting environmental exposure** | | |
|---|---|---|
| Receiving surface water flow | : | 18 000 m3/d |
| Local freshwater dilution factor | : | 10 |
| Local marine water dilution factor | : | 100 |

**4.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Use as laboratory reagent (PROC15)**

| **Product (article) characteristics** | | |
|---|---|---|
| Covers concentrations up to 100 % | | |
| Physical form of product | : | Liquid<br>Low volatile liquid |

| **Technical and organisational conditions and measures** |
|---|
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Assumes a good basic standard of occupational hygiene is implemented<br>Ensure control measures are regularly inspected and maintained.<br>Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.<br>Ensure safe systems of work or equivalent arrangements are in place to manage risks.<br>Ensure there is no direct skin contact with product.<br>Identify potential areas for indirect skin contact.<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.<br>When not in use, keep containers tightly closed. |

| **Conditions and measures related to personal protection, hygiene and health evaluation** |
|---|
| Use suitable eye protection. |
| Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. |
| Wear an impervious suit. |
| Wear suitable respiratory protection. |

| For further specification, refer to section 8 of the SDS. | | |
|---|---|---|
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Professional or industrial settings | : | Industrial use |

## 4.3. Exposure estimation and reference to its source

### 4.3.1. Environmental release and exposure: Use of intermediate (ERC6a)

| Release route | Release rate | Release estimation method |
|---|---|---|
| Water | 0 % | |
| Air | 5 % | |
| Soil | 0,1 % | |

| Protection Target | Exposure estimate | RCR |
|---|---|---|
| Freshwater | < 0,001µg/L (EASY TRA v4.1) | 9,35 E-7 |
| Freshwater sediment | 0,044µg/kg dry weight (EASY TRA v4.1) | 9,34 E-7 |
| Marine water | < 0,001µg/L (EASY TRA v4.1) | 9,02 E-7 |
| Marine sediment | < 0,001µg/kg dry weight (EASY TRA v4.1) | 9,01 E-7 |
| Soil | 0,081mg/kg dry weight (EASY TRA v4.1) | 0,007 |

**4.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Use as laboratory reagent (PROC15)**

| Additional information on exposure estimation |
|---|
| No exposure assessment presented for human health.<br>Risk management measures are based on qualitative risk characterisation. |

**4.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**
Wastewater emission controls are not applicable as there is no direct release to wastewater.

## ES 5: Industrial use of reactive processing aids

### 5.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Industrial use of reactive processing aids |
| **Substance** | : | tetrahydromethylphthalic anhydrideEC-No.: 234-290-7<br>Registration number:<br>01-2119488054-36 |

| | | |
|---|---|---|
| **Environment** | | |
| **CS 1** | **Industrial use of reactive processing aids** | ERC6b |
| **Worker** | | |
| **CS 2** | **Industrial use** | PROC1,<br>PROC2,<br>PROC3,<br>PROC4,<br>PROC5,<br>PROC8a,<br>PROC8b,<br>PROC9,<br>PROC10,<br>PROC13,<br>PROC15 |

### 5.2. Conditions of use affecting exposure

#### 5.2.1. Control of environmental exposure: Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6b)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Physical form of product | : | Liquid |
| **Amount used (or contained in articles), frequency and duration of use/exposure** | | |
| Annual site tonnage | : | 1000 t |
| Daily amount per site | : | 50000 kg |
| Emission days | : | 20 |
| **Technical and organisational conditions and measures** | | |
| Municipal sewage treatment is not assumed.<br>No discharge of substance into waste water | | |
| **Conditions and measures related to sewage treatment plant** | | |

| | | |
|---|---|---|
| STP type | : | none |

| **Conditions and measures related to treatment of waste (including article waste)** | | |
|---|---|---|
| Waste treatment | : | Liquid and/or solid waste is treated by incineration. |

| **Other conditions affecting environmental exposure** | | |
|---|---|---|
| Receiving surface water flow | : | 18 000 m3/d |
| Local freshwater dilution factor | : | 10 |
| Local marine water dilution factor | : | 100 |

**5.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Use as laboratory reagent (PROC15)**

| **Product (article) characteristics** | | |
|---|---|---|
| Covers concentrations up to 100 % | | |
| Physical form of product | : | Liquid<br>Low volatile liquid |

| **Technical and organisational conditions and measures** |
|---|
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Assumes a good basic standard of occupational hygiene is implemented<br>Ensure control measures are regularly inspected and maintained.<br>Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.<br>Ensure safe systems of work or equivalent arrangements are in place to manage risks.<br>Ensure there is no direct skin contact with product.<br>Identify potential areas for indirect skin contact.<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.<br>When not in use, keep containers tightly closed. |

| **Conditions and measures related to personal protection, hygiene and health evaluation** |
|---|
| Use suitable eye protection. |
| Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. |
| Wear an impervious suit. |
| Wear suitable respiratory protection. |

| For further specification, refer to section 8 of the SDS. | | |
|---|---|---|
| **Other conditions affecting workers exposure** | | |
| Indoor or outdoor use | : | Indoor use |
| Professional or industrial settings | : | Industrial use |

## 5.3. Exposure estimation and reference to its source

### 5.3.1. Environmental release and exposure: Use of reactive processing aid at industrial site (no inclusion into or onto article) (ERC6b)

| Release route | Release rate | Release estimation method |
|---|---|---|
| Water | 0 % | |
| Air | 0,1 % | |
| Soil | 0,025 % | |

| Protection Target | Exposure estimate | RCR |
|---|---|---|
| Freshwater | < 0,001µg/L (EASY TRA v4.1) | 9,35 E-7 |
| Freshwater sediment | 0,044µg/kg dry weight (EASY TRA v4.1) | 9,34 E-7 |
| Marine water | < 0,001µg/L (EASY TRA v4.1) | 9,02 E-7 |
| Marine sediment | < 0,001µg/kg dry weight (EASY TRA v4.1) | 9,01 E-7 |
| Soil | 1,64µg/kg dry weight (EASY TRA v4.1) | 0,000124 |

### 5.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Use as laboratory reagent (PROC15)

| Additional information on exposure estimation |
|---|
| No exposure assessment presented for human health.<br>Risk management measures are based on qualitative risk characterisation. |

**5.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**
Wastewater emission controls are not applicable as there is no direct release to wastewater.

## ES 6: Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

### 6.1. Title section

| | | |
|---|---|---|
| **Exposure Scenario name** | : | Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers |
| **Substance** | : | tetrahydromethylphthalic anhydrideEC-No.: 234-290-7<br>Registration number:<br>01-2119488054-36 |

| | | |
|---|---|---|
| **Environment** | | |
| **CS 1** | **Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers** | ERC6d |
| **Worker** | | |
| **CS 2** | **Industrial use** | PROC1, PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9, PROC10, PROC13, PROC15 |

### 6.2. Conditions of use affecting exposure

#### 6.2.1. Control of environmental exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

| | | |
|---|---|---|
| **Product (article) characteristics** | | |
| Physical form of product | : | Liquid |
| **Amount used (or contained in articles), frequency and duration of use/exposure** | | |
| Annual site tonnage | : | 1000 t |
| Daily amount per site | : | 50000 kg |
| Emission days | : | 20 |
| **Technical and organisational conditions and measures** | | |
| Municipal sewage treatment plant is assumed. | | |

| **Conditions and measures related to sewage treatment plant** | | |
|---|---|---|
| STP type | : | Municipal Sewage Treatment Plant |

| **Conditions and measures related to treatment of waste (including article waste)** | | |
|---|---|---|
| Waste treatment | : | Liquid and/or solid waste is treated by incineration. |

| **Other conditions affecting environmental exposure** | | |
|---|---|---|
| Receiving surface water flow | : | 18 000 m3/d |
| Local freshwater dilution factor | : | 10 |
| Local marine water dilution factor | : | 100 |

**6.2.2. Control of worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Use as laboratory reagent (PROC15)**

| **Product (article) characteristics** | | |
|---|---|---|
| Covers concentrations up to 100 % | | |
| Physical form of product | : | Liquid<br>Low volatile liquid |

| **Technical and organisational conditions and measures** |
|---|
| Provide a good standard of general ventilation (not less than 3 to 5 air changes per hour). |
| Assumes a good basic standard of occupational hygiene is implemented<br>Ensure control measures are regularly inspected and maintained.<br>Minimise exposure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation.<br>Ensure safe systems of work or equivalent arrangements are in place to manage risks.<br>Ensure there is no direct skin contact with product.<br>Identify potential areas for indirect skin contact.<br>Supervision in place to check that the risk management measures in place are being used correctly and operation conditions followed.<br>When not in use, keep containers tightly closed. |

| **Conditions and measures related to personal protection, hygiene and health evaluation** |
|---|
| Use suitable eye protection. |
| Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. |

| |
|---|
| Wear an impervious suit. |
| Wear suitable respiratory protection. |
| For further specification, refer to section 8 of the SDS. |

| **Other conditions affecting workers exposure** | | |
|---|---|---|
| Indoor or outdoor use | : | Indoor use |
| Professional or industrial settings | : | Industrial use |

## 6.3. Exposure estimation and reference to its source

### 6.3.1. Environmental release and exposure: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6d)

| Release route | Release rate | Release estimation method |
|---|---|---|
| Water | 0,005 % | |
| Air | 35 % | |
| Soil | 0,025 % | |

| Protection Target | Exposure estimate | RCR |
|---|---|---|
| Freshwater | 0,006mg/L (EASY TRA v4.1) | 0,003 |
| Freshwater sediment | 0,146mg/kg dry weight (EASY TRA v4.1) | 0,003 |
| Marine water | 0,626µg/L (EASY TRA v4.1) | 0,003 |
| Marine sediment | 0,015mg/kg dry weight (EASY TRA v4.1) | 0,003 |
| Sewage treatment plant | 0,063mg/L (EASY TRA v4.1) | 0,089 |
| Soil | 0,757mg/kg dry weight (EASY TRA v4.1) | 0,066 |

### 6.3.2. Worker exposure: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions (PROC1) / Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC2) / Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition (PROC3) / Chemical production where opportunity for exposure arises (PROC4) / Mixing or blending in batch processes (PROC5) / Transfer of substance or mixture (charging/discharging) at non dedicated-facilities (PROC8a) / Transfer of substance or mixture (charging/discharging) at dedicated facilities (PROC8b) / Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC9) / Roller application or brushing (PROC10) / Treatment of articles by dipping and pouring (PROC13) / Use as laboratory reagent (PROC15)

| **Additional information on exposure estimation** |
|---|

| |
|---|
| No exposure assessment presented for human health.<br>Risk management measures are based on qualitative risk characterisation. |

**6.4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES**
Predicted exposures are not expected to exceed the applicable exposure limits (given in section 8 of the SDS) when the operational conditions/risk management measures given in section 2 are implemented.
Where other risk management measures/operational conditions are adopted, then users should ensure that risks are managed to at least equivalent levels.

Guidance is based on assumed operating conditions which may not be applicable to all sites; thus, scaling may be necessary to define appropriate site-specific risk management measures.