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

1.1. Product identifier

Trade name : ADIPIC ACID
Substance name : Adipic acid

Index-No. : 607-144-00-9
EC-No. : 204-673-3
REACH Registration Number : 01-2119457561-38-0000

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

Use of the Substance/Mixture
Intermediate chemical

A tabular overview of all uses for which an exposure scenario is provided can be found at the beginning of the annex to this safety data sheet.

1.3. Details of the supplier of the safety data sheet

Company
SysKem Chemie GmbH
Brucknerweg 26
D-42289 Wuppertal

Telephone +49 (0) 202/30999510
Telefax +49 (0) 202/87088403
E-mail address info@syskem.de

Prepared by / E-mail address of person responsible for the SDS
info@syskem.de

1.4. Emergency telephone number

Vergiftungs-Informations-Zentrale Freiburg, Tel. +49 761 19240.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)
Eye Irrit. 2 H319 Causes serious eye irritation

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]
Hazard pictograms (CLP)

GHS07

Signal word (CLP)
Warning

Hazard statements (CLP)
H319 - Causes serious eye irritation.

Precautionary statements (CLP)
P264 - Wash face, hands and any exposed skin thoroughly after handling.
P280 - Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 - If eye irritation persists: Get medical advice/attention.

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.

SECTION 3: Composition/information on ingredients

3.1. Substances

Components

Chemical name	CAS-No. EC-No.	Classification	Concentration (% w/w)
adipic acid	124-04-9 204-673-3	Eye Irrit. 2; H319	>= 99,8

For explanation of abbreviations see section 16.

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

General advice
Move out of dangerous area.
Show this safety data sheet to the doctor in attendance.
Do not leave the victim unattended.

If inhaled
If breathed in, move person into fresh air.
If symptoms persist, call a physician.

In case of skin contact
If on skin, rinse well with water.
Take off contaminated clothing and shoes immediately.
If symptoms persist, call a physician.

In case of eye contact
Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids.
Keep eye wide open while rinsing.
Remove contact lenses.
Continue to rinse for at least 10 minutes.
Protect unharmed eye.
If eye irritation persists, consult a specialist.

If swallowed
Rinse mouth with water.
Give small amounts of water to drink.
DO NOT induce vomiting unless directed to do so by a physician or poison control center.
If symptoms persist, call a physician.

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

Risks
Causes serious eye irritation.

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
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable extinguishing media
Do NOT use water jet.

5.2. Special hazards arising from the substance or mixture

Specific hazards during firefighting
Fine powder forms flammable and explosive mixtures in air.

Hazardous combustion products
Carbon dioxide (CO_2)
Carbon monoxide

5.3. Advice for firefighters

Special protective equipment for firefighters
Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Further information
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
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
Avoid breathing dust.
Avoid dust formation.
Use personal protective equipment.

6.2. Environmental precautions

Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.
Prevent further leakage or spillage if safe to do so.
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
Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

For personal protection see section 8.
For disposal considerations see section 13.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Annex should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1. Precautions for safe handling

Technical measures
Take precautionary measures against static discharges.

Local/Total ventilation
Use only with adequate ventilation.

Advice on safe handling
For personal protection see section 8.
Avoid contact with skin and eyes.
Do not breathe dust.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion
Avoid dust formation.
Provide appropriate exhaust ventilation at places where dust is formed.

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

Dust explosion class
In the case of dusty organic products the possibility of a dust explosion should always be considered.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers
Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and wellventilated area, away from incompatible materials (see Section 10) and food and drink. Keep containers sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage.

Advice on common storage
No materials to be especially mentioned.

Further information on storage stability
No decomposition if stored and applied as directed.

7.3. Specific end use(s)

Intermediate
Washing and cleaning products
Polymer preparations and compounds

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Annex should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
adipic acid	124-04-9	OELV - 8 hrs (TWA)	5 mg/m3	IE OEL

Further information
Where no specific short-term exposure limit is listed, a figure three times the long-term exposure limit value should be used.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
adipic acid	Workers	Inhalation	Long-term exposure, Systemic effects	264 mg/m3
	Workers	Inhalation	Short-term exposure, Systemic effects	264 mg/m3
	Workers	Inhalation	Long-term exposure, Local effects	5 mg/m3
	Workers	Inhalation	Short-term exposure, Local effects	5 mg/m3
	Workers	Dermal	Long-term exposure, Systemic effects	38 mg/kg bw/day
	Workers	Dermal	Short-term exposure, Systemic effects	38 mg/kg bw/day
	Consumers	Inhalation	Long-term exposure, Local effects	65 mg/m3
	Consumers	Inhalation	Short-term exposure, Local effects	65 mg/m3
	Consumers	Dermal	Long-term exposure, Systemic effects	19 mg/kg bw/day
	Consumers	Dermal	Short-term exposure, Systemic effects	19 mg/kg bw/day
	Consumers	Oral	Long-term exposure, Systemic effects	19 mg/kg bw/day
	Consumers	Oral	Short-term exposure, Systemic effects	19 mg/kg bw/day

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

Substance name	Environmental Compartment	Value
adipic acid	Fresh water	0,126 mg/l
	Freshwater – intermittent	0,46 mg/l
	Marine water	0,0126 mg/l
	Sewage treatment plant	59,1 mg/l
	Fresh water sediment	0,484 mg/kg dry weight (d.w.)
	Marine sediment	0,0484 mg/kg dry weight (d.w.)
	Soil	0,0228 mg/kg dry weight (d.w.)

8.2. Exposure controls

Personal protective equipment
Eye protection
Safety glasses with side-shields

Hand protection

Material	: Polychloroprene - CR
Wearing time	: < 60 min
Material	: Nitrile rubber - NBR
Wearing time	: < 60 min
Material	: Butyl rubber - IIR
Wearing time	: < 60 min
Material	: Fluorinated rubber - FKM
Wearing time	: < 60 min

Remarks
The suitability for a specific workplace should be discussed with the producers of the protective gloves. After contamination with product change the gloves immediately and dispose of them according to relevant national and local regulations.

Skin and body protection
Dust impervious protective suit
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection
In case of dust formation particle filter.
Filter type : P2 filter

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	: Crystalline powder.
Colour	: colourless.
Odour	: odourless.
Odour threshold	: No data available
pH	: No data available
Melting point/range	: 151 °C
Boiling point/boiling range	: 338 °C (1.013 hPa)
Flash point	: 196 °C Method: Regulation (EC) No. 440/2008, Annex, A.9, closed cup
Evaporation rate	: No data available
Flammability (solid, gas)	: No data available
Upper explosion limit	: No data available
Lower explosion limit	: No data available
Vapour pressure	: < 1 hPa (20 °C)
Relative vapour density	: No data available
Relative density	: No data available
Density	: 1,36 g/cm3 (20 °C)
Bulk density	: 700 kg/m3
Solubility(ies)	
Water solubility	: 23 g/l (25 °C)
Partition coefficient n-octanol/water	: No data available
Ignition temperature	: > 400 °C
Decomposition temperature	: 230 °C

Viscosity	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available

9.2. Other information

Dust explosion class	: In the case of dusty organic products the possibility of a dust explosion should always be considered.

SECTION 10: Stability and reactivity

10.1. Reactivity

No specific test data related to reactivity available for this product or its ingredients.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Dust can form an explosive mixture in air.
Under normal conditions of storage and use, hazardous reactions will not occur.

10.4. Conditions to avoid

No data available.

10.5. Incompatible materials

Materials to avoid:
No specific data.

10.6. Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity
Not classified based on available information.

Components:
adipic acid:

Acute oral toxicity	: LD50 (Rat, male and female): 5.560 mg/kg Method: OECD Test Guideline 401 GLP: no
Acute inhalation toxicity	: LC0 (Rat, male and female): 7,7 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: OECD Test Guideline 403 GLP: no Remarks: Highest producible concentration.
Acute dermal toxicity	: LD0 (Rabbit, male and female): 7.940 mg/kg GLP: no Remarks: Highest producible concentration.

Skin corrosion/irritation
Not classified based on available information.

Components:
adipic acid:
Species: Rabbit
GLP: no
Remarks: Mild skin irritation
Fully reversible in 7 days or less

Serious eye damage/eye irritation
Causes serious eye irritation.

Components:
adipic acid:
Species: Rabbit
Exposure time: 24 h
Assessment: Risk of serious damage to eyes.
Method: OECD Test Guideline 405
Result: Risk

Respiratory or skin sensitisation
Skin sensitisation
Not classified based on available information.

Respiratory sensitisation
Not classified based on available information.

Components:
adipic acid:
Exposure routes: Skin contact
Species: Guinea pig
Result: Did not cause sensitisation on laboratory animals.

Germ cell mutagenicity
Not classified based on available information.

Components:
adipic acid:

Genotoxicity in vitro	Test Type: Ames test Test system: Bacteria Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative Test Type: Chromosome aberration test in vitro Test system: human diploid fibroblasts Metabolic activation: without metabolic activation Result: negative GLP: no Test Type: In vitro mammalian cell gene mutation test Test system: Chinese hamster lung cells Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 476 Result: negative GLP: yes

Carcinogenicity
Not classified based on available information.

Components:
adipic acid:
Species: Rat, (male and female)
Application Route: Oral
Exposure time: 2 Years
NOAEL: ca. 750 mg/kg bw/day
GLP: no

Reproductive toxicity
Not classified based on available information.

Components:
adipic acid:

Effects on foetal development	Species: Rabbit Application Route: Oral Duration of Single Treatment: 13 d General Toxicity Maternal: NOAEL: 250 mg/kg body weight Developmental Toxicity: NOAEL: 250 mg/kg body weight GLP: no

STOT - single exposure
Not classified based on available information.

STOT - repeated exposure
Not classified based on available information.

Aspiration toxicity
Not classified based on available information.

Further information
Product:
Remarks: No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:
adipic acid:

Toxicity to fish	LC0 (Danio rerio (zebra fish)): > 1.000 mg/l Exposure time: 96 h GLP: yes
Toxicity to daphnia and other aquatic invertebrates	EC50 (Daphnia magna (Water flea)): 46 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae	EC50 (Pseudokirchneriella subcapitata (microalgae)): 59 mg/l End point: Growth rate Exposure time: 72 h Method: OECD Test Guideline 201 NOEC (Pseudokirchneriella subcapitata (green algae)): 41 mg/l End point: Growth rate Exposure time: 72 h Method: OECD Test Guideline 201

Toxicity to microorganisms	EC50 (Tetrahymena pyriformis): 591,02 mg/l End point: Growth rate Exposure time: 40 h EC50 (activated sludge): 4.747 mg/l End point: Respiration inhibition Exposure time: 3 h Method: OECD Test Guideline 209
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	NOEC: 6,3 mg/l End point: Reproduction Exposure time: 21 d Species: Daphnia magna (Water flea) Method: OECD Test Guideline 211

12.2 Persistence and degradability

Components:
adipic acid

Biodegradability	Inoculum: activated sludge Result: Readily biodegradable. Biodegradation: 83 % Exposure time: 30 d Method: OECD Test Guideline 301D GLP: no Result: Inherently biodegradable. Biodegradation: > 90 % Exposure time: 5 d Method: Regulation (EC) No. 440/2008, Annex, C.9

12.3 Bioaccumulative potential

Components:
adipic acid

Bioaccumulation	Bioconcentration factor (BCF): 3,16
Partition coefficient: n-octanol/water	log Pow: 0,093 Method: measured

12.4 Mobility in soil

Components:
adipic acid:

Distribution among environmental compartments	Koc: 21,5, log Koc: 0,093

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.

Components:
adipic acid:

Assessment	This substance is not considered to be persistent, bioaccumulating and toxic (PBT).. This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Other adverse effects

Product:

Additional ecological information	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Harmful to aquatic life.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Annex should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods

Product

The generation of waste should be avoided or minimised wherever possible.
Where possible recycling is preferred to disposal or incineration.
Wastedisposal should be in accordance with existing federal state, provincial and or local environmental controls
The product should not be allowed to enter drains, water courses or the soil.

Contaminated packaging

Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

SECTION 14: Transport information

14.1 UN number

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Hazard statements	Not dangerous cargo. Irritating to the eyes. Keep separated from foodstuffs.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

International Chemical Weapons Convention (CWC)
Schedules of Toxic Chemicals and Precursors
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 - List of substances subject to authorisation (Annex XIV)
Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer
Not applicable

Regulation (EU) 2019/1021 on persistent organic pollutants (recast)
Not applicable

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals
Not applicable

REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, preparations and articles (Annex XVII)
Not applicable

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

15.2 Chemical Safety Assessment

A Chemical Safety Assessment has been carried out for this substance.

SECTION 16: Other information

Full text of H-Statements

H319	: Causes serious eye irritation.

Full text of other abbreviations

Eye Irrit.	: Eye irritation

Indication of changes:
Section 1

Datasheet exhibiting area
SysKem Chemie GmbH
Department Product safety
Telephone +49 (0) 202/30999510

Further information
The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet and its Annex [if required according to Regulation (EC) 1907/2006 (REACh)] is to describe the products in terms of their safety requirements. The given details do not imply any guarantee concerning the composition, properties or performance.

Abbreviations and acronyms

ADN = Accord Européen relatif au Transport International des Marchandises Dangereuses par voie de Navigation du Rhin
ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route
ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
CLP = Classification, Labelling and Packaging Regulation according to 1272/2008/EC
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IE OEL = Ireland. List of Chemical Agents and Occupational Exposure Limit Values - Schedule 1
IE OEL / OELV - 8 hrs (TWA) = Occupational exposure limit value (8-hour reference period)
IMDG = International Maritime Dangerous Goods Code
LEL = Lower Explosive Limit/Lower Explosion Limit
UEL = Upper Explosion Limit/Upper Explosive Limit
REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals
CSR = CSR = Chemical Safety Report
DNEL = DNEL = Derived No Effect Level
NOAEL = No observed adverse effect level
LD50 = Median lethal dose
EC50 = Median Effective Concentration
N.O.S. = Not Otherwise Specified
PNEC = Predicted No Effect Concentration
STEL = Short term exposure limit
TLV = Threshold limits
TWA = time weighted average
persistent, bioaccumulating and toxic (PBT).
vPvB = very persistent and very bioaccumulating

Annex
Exposure Scenario (ES)

Number	Title
ES 1	Use as an intermediate, Monomers, Industrial (ERC6a; ERC6c; ERC6d; PROC1; PROC2; PROC3; PROC4; PROC8a; PROC8b; PROC9) Structured Short Title: Use at industrial sites; Various products (PC19, PC32); Various sectors (SU8, SU9, SU12); production of polyamides (mainly nylon 66), polyester-polyole, polyurethane and adipate etc.
ES 2	Preparation and uses of formulations., Industrial (ERC2; ERC6b; PROC1; PROC2; PROC3; PROC4; PROC5; PROC7; PROC8a; PROC8b; PROC9; PROC10; PROC13) Structured Short Title: Formulation or re-packing; Various products (PC20, PC23); Manufacture of textiles, leather, fur (SU5).
ES 3	Use in the production of dish washing machine tablets, Industrial (ERC2; PROC2; PROC5; PROC8a; PROC13; PROC14) Structured Short Title: Formulation or re-packing; Washing and cleaning products (PC35).
ES 4	Use of dish washing machine tablets by consumers, Consumer (ERC8a; PC35) Structured Short Title: Consumer use
ES 5	Use in flue gas desulphurisation., Industrial (ERC8e; PROC16) Structured Short Title: Use at industrial sites; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Electricity, steam, gas water supply and sewage treatment (SU23).
ES 6	Use in laboratories, Professional (ERC8a; ERC8b; PROC15) Structured Short Title: Widespread use by professional workers; Laboratory chemicals (PC21).

ES1: Use as an intermediate, Monomers, Industrial

1.1. Title section

Structured Short Title	Use at industrial sites; Various products (PC19, PC32); Various sectors (SU8, SU9, SU12); production of polyamides (mainly nylon 66), polyester-polyole, polyurethane and adipate etc..
Substance	Adipic acid EC-No.: 204-673-3 CAS-No.: 124-04-9

Environmental release category(ies)	ERC6a: Use of intermediate ERC6c: Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article) ERC6d: Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)
Process category(ies)	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)

Contributing Scenario (CS) Environment		
CS1	**Use of intermediate; Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article); Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article)**	ERC6a, ERC6c, ERC6d

Contributing Scenario (CS) Worker		
CS2	**Use in closed process; Continuous process; Batch process; Solid in solution**	PROC1, PROC2, PROC3
CS3	**Use in semi-closed process with opportunity for exposure; Material transfers; Dedicated facility; Small package filling; Small scale weighing; Solid in solution**	PROC4, PROC8b, PROC9
CS4	**Material transfers; Non-dedicated facility; Solid in solution**	PROC8a
CS5	**Worker Contributing Scenario; Solid**	PROC8a, PROC8b, PROC9

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Use of intermediate; Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article); Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6a, ERC6c, ERC6d)

Remarks:
ERCs for communication purposes only.

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	75330 t
Daily amount per site	251,1 t
Release type	Continuous release
Emission days per year	300

Technical and organisational conditions and measures
Suitable technique(s) to limit releases to water: The waste water has to be directed to a dedicated sewage treatment plant or treated by other suitable techniques.
Suitable technique(s) to limit releases to air: Waste air should be scrubbed or filtered. Air - minimum efficiency of 98 %
Suitable technique(s) to limit releases to soil: Floor should be impervious and resistant to liquid.

Conditions and measures related to sewage treatment plant	
STP type	Onsite Sewage Treatment Plant Water - minimum efficiency of 96 %
Additional information on STP	Biological elimination
STP effluent	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	No specific measures identified.
Waste disposal methods	For general information on waste disposal see section 13.

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: Use in closed process; Continuous process; Batch process; Solid in solution (PROC1, PROC2, PROC3)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Covers indoor and outdoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.
Breathing volume	10 m3/d

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

1.2.3. Control of worker exposure: Use in semi-closed process with opportunity for exposure; Material transfers; Dedicated facility; Small package filling; Small scale weighing; Solid in solution (PROC4, PROC8b, PROC9)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 1 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection. Wear suitable gloves tested to EN374.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Covers indoor and outdoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.
Breathing volume	10 m3/d

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

1.2.4. Control of worker exposure: Material transfers; Non-dedicated facility; Solid in solution (PROC8a)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 15 min
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection. Wear suitable gloves tested to EN374.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Covers indoor and outdoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.
Breathing volume	10 m3/d

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

1.2.5. Control of worker exposure: Worker Contributing Scenario; Solid (PROC8a, PROC8b, PROC9)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Covers indoor and outdoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.
Breathing volume	10 m3/d

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

1.3. Exposure estimation and reference to its source

1.3.1. Environmental release and exposure: Use of intermediate; Use of monomer in polymerisation processes at industrial site (inclusion or not into/onto article); Use of reactive process regulators in polymerisation processes at industrial site (inclusion or not into/onto article) (ERC6a, ERC6c, ERC6d)

Release route	Release	Release estimation method
Water	0,02 %	Expert judgement
Air	0,002 %	Expert judgement
Soil	0 %	ERC based

Compartement	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	EUSES v2.1

1.3.2. Worker exposure: Use in closed process; Continuous process; Batch process; Solid in solution (PROC1, PROC2, PROC3)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

1.3.3. Worker exposure: Use in semi-closed process with opportunity for exposure; Material transfers; Dedicated facility; Small package filling; Small scale weighing; Solid in solution (PROC4, PROC8b, PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

1.3.4. Worker exposure: Material transfers; Non-dedicated facility; Solid in solution (PROC8a)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

1.3.5. Worker exposure: Worker Contributing Scenario; Solid (PROC8a, PROC8b, PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

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

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

ES2: Preparation and uses of formulations., Industrial

2.1. Title section

Structured Short Title	Formulation or re-packing; Various products (PC20, PC23); Manufacture of textiles, leather, fur (SU5).
Substance	Adipic acid EC-No.: 204-673-3 CAS-No.: 124-04-9

Environmental release category(ies)	ERC2: Formulation into mixture ERC6b: Use of reactive processing aid at industrial site (no inclusion into or onto article)
Process category(ies)	PROC1: Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC3: Manufacture or formulation in the chemical industry in closed batch processes with occasional controlled exposure or processes with equivalent containment condition PROC4: Chemical production where opportunity for exposure arises PROC5: Mixing or blending in batch processes PROC7: Industrial spraying PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC8b: Transfer of substance or mixture (charging/discharging) at dedicated facilities PROC9: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) PROC10: Roller application or brushing PROC13: Treatment of articles by dipping and pouring

Contributing Scenario (CS) Environment		
CS1	**Use of reactive processing aid at industrial site (no inclusion into or onto article)**	ERC6b

Contributing Scenario (CS) Worker		
CS2	**Use in closed process**	PROC1
CS3	**Various processes**	PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9
CS4	**Rolling, Brushing; Dipping, immersion and pouring**	PROC10, PROC13
CS5	**Spraying**	PROC7
CS6	**Worker Contributing Scenario; With Local Exhaust Ventilation**	PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9
CS7	**Worker Contributing Scenario; With Local Exhaust Ventilation**	PROC10, PROC13

2.2. Conditions of use affecting exposure

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

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	251 t
Daily amount per site	837 kg
Release type	Continuous release
Emission days per year	300

Technical and organisational conditions and measures
Suitable technique(s) to limit releases to water: The waste water has to be directed to a dedicated sewage treatment plant or treated by other suitable techniques.
Suitable technique(s) to limit releases to air: Waste air should be scrubbed or filtered. Air - minimum efficiency of 98 %
Suitable technique(s) to limit releases to soil: Floor should be impervious and resistant to liquid.

Conditions and measures related to sewage treatment plant	
STP type	Onsite Sewage Treatment Plant Water - minimum efficiency of 96 %
Additional information on STP	Biological elimination
STP effluent	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	No specific measures identified.
Waste disposal methods	For general information on waste disposal see section 13.

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: Use in closed process; Continuous process; Batch process; Solid in solution (PROC1, PROC2, PROC3)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 5 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

2.2.3. Control of worker exposure: Various processes (PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 5 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 1 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

2.2.4. Control of worker exposure: Rolling, Brushing; Dipping, immersion and pouring (PROC10, PROC13)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 5 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 1 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection. Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

2.2.5. Control of worker exposure: Spraying (PROC7)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 50 %
Physical form of product	Powdered mixture

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.
Automated task Minimise exposure by extracted full enclosure for the operation or equipment.
Local exhaust ventilation Inhalation - minimum efficiency of 95 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective cloth- ing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

2.2.6. Control of worker exposure: Worker Contributing Scenario; With Local Exhaust Ventilation (PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 5 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.
Local exhaust ventilation Inhalation - minimum efficiency of 90 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

2.2.7. Control of worker exposure: Worker Contributing Scenario; With Local Exhaust Ventilation (PROC10, PROC13)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 5 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.
Local exhaust ventilation Inhalation - minimum efficiency of 90 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection. Wear suitable gloves tested to EN374. Dermal - minimum efficiency of 80 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

2.3. Exposure estimation and reference to its source

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

Release route	Release	Release estimation method
Water	5 %	ERC based
Air	2,5 %	ERC based
Soil	0 %	ERC based

Compartement	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	EUSES v2.1

2.3.2. Worker exposure: Use in closed process (PROC1)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

2.3.3. Worker exposure: Various processes (PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

2.3.4. Worker exposure: Rolling, Brushing; Dipping, immersion and pouring (PROC10, PROC13)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

2.3.5. Worker exposure: Spraying (PROC7)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

2.3.6. Worker exposure: Worker Contributing Scenario; With Local Exhaust Ventilation (PROC2, PROC3, PROC4, PROC5, PROC8a, PROC8b, PROC9)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

2.3.7. Worker exposure: Worker Contributing Scenario; With Local Exhaust Ventilation (PROC10, PROC13)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

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

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

ES3: Use in the production of dish washing machine tablets, Industrial

3.1. Title section

Structured Short Title	Formulation or re-packing; Washing and cleaning products (PC35).
Substance	Adipic acid EC-No.: 204-673-3 CAS-No.: 124-04-9

Environmental release category(ies)	ERC2: Formulation into mixture
Process category(ies)	PROC2: Chemical production or refinery in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions PROC5: Mixing or blending in batch processes PROC8a: Transfer of substance or mixture (charging/discharging) at non dedicated-facilities PROC13: Treatment of articles by dipping and pouring PROC14: Tabletting, compression, extrusion, pelettisation, granulation

Contributing Scenario (CS) Environment		
CS1	**Formulation into mixture**	ERC2

Contributing Scenario (CS) Worker		
CS2	**Continuous process; Closed systems**	PROC2
CS3	**Worker Contributing Scenario; With Local Exhaust Ventilation**	PROC2
CS4	**Mixing operations**	PROC5
CS5	**Material transfers; Non-dedicated facility; Dipping, immersion and pouring**	PROC8a, PROC13
CS6	**Worker Contributing Scenario; With Local Exhaust Ventilation**	PROC5, PROC8a, PROC13
CS7	**Tabletting, compression, extrusion or pelletisation**	PROC14
CS8	**Equipment maintenance**	PROC0

3.2. Conditions of use affecting exposure

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

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	2430 t
Daily amount per site	8,1 t
Release type	Continuous release
Emission days per year	300

Technical and organisational conditions and measures
Suitable technique(s) to limit releases to water: The waste water has to be directed to a dedicated sewage treatment plant or treated by other suitable techniques. Pre-treatment of waste water by pH-adjustment, flocculation / precipitation, sedimentation.
Suitable technique(s) to limit releases to air: Waste air should be scrubbed or filtered. Air - minimum efficiency of 99 %
Suitable technique(s) to limit releases to soil: Floor should be impervious and resistant to liquid.

Conditions and measures related to sewage treatment plant	
STP type	Onsite Sewage Treatment Plant Water - minimum efficiency of 96 %
Additional information on STP	Biological elimination
STP sludge treatment	Sewage sludge incineration
STP effluent	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	No specific measures identified.
Waste disposal methods	For general information on waste disposal see section 13.

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: Continuous process; Closed systems (PROC2)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 25 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective cloth- ing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

3.2.3. Control of worker exposure: Worker Contributing Scenario; With Local Exhaust Ventilation (PROC2)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 25 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.
Local exhaust ventilation Inhalation - minimum efficiency of 90 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

3.2.4. Control of worker exposure: Mixing operations (PROC5)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 25 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 1 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with 'basic' employee training. Dermal - minimum efficiency of 90 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective cloth- ing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

3.2.5. Control of worker exposure: Material transfers; Non-dedicated facility; Dipping, immersion and pouring (PROC8a, PROC13)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 25 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 15 min.
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. Dermal - minimum efficiency of 90 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

3.2.6. Control of worker exposure: Worker Contributing Scenario; With Local Exhaust Ventilation (PROC5, PROC8a, PROC13)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 25 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.
Local exhaust ventilation Inhalation - minimum efficiency of 90 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Wear chemically resistant gloves (tested to EN374) in combination with ‘basic’ employee training. Dermal - minimum efficiency of 90 %
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

3.2.7. Control of worker exposure: Tabletting, compression, extrusion or pelletisation (PROC14)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid mixture

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.
Local exhaust ventilation Inhalation - minimum efficiency of 90 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use.
Temperature	Covers use at ambient temperatures.
Ventilation rate	Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

3.2.8. Control of worker exposure: Equipment maintenance (PROC0)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 25 %
Physical form of product	Liquid

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 1 h
Use frequency	52 days per year
Use frequency	1 day per week

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection. Wear suitable gloves tested to EN374. 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.
Temperature	Assumes process temperature up to 180 °C
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

3.3. Exposure estimation and reference to its source

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

Release route	Release	Release estimation method
Water	2,5 %	ERC based
Air	2,5 %	ERC based
Soil	0 %	ERC based

Compartement	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	EUSES v2.1

3.3.2. Worker exposure: Continuous process; Closed systems (PROC2)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

3.3.3. Worker exposure: Worker Contributing Scenario; With Local Exhaust Ventilation (PROC2)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

3.3.4. Worker exposure: Mixing operations (PROC5)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

3.3.5. Worker exposure: Material transfers; Non-dedicated facility; Dipping, immersion and pouring (PROC8a, PROC13)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

3.3.6. Worker exposure: Worker Contributing Scenario; With Local Exhaust Ventilation (PROC5, PROC8a, PROC13)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

3.3.7. Worker exposure: Tabletting, compression, extrusion or pelletisation (PROC14)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

3.3.8. Worker exposure: Equipment maintenance (PROC0)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

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

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

ES4: Use of dish washing machine tablets by consumers, Consumer

4.1. Title section

Structured Short Title	Consumer use
Substance	Adipic acid EC-No.: 204-673-3 CAS-No.: 124-04-9

Environmental release category(ies)	ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)
Product (sub) category(ies)	PC35: Washing and cleaning products

Contributing Scenario (CS) Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor)**	ERC8a

Contributing Scenario (CS) Consumer		
CS2	**Laundry and dish washing products**	PC35

4.2. Conditions of use affecting exposure

4.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Amount used, frequency and duration of use (or from service life)	
Annual amount for wide disperse uses	0,45 t
Daily amount for wide dispersive uses	1,23 kg
Release type	Continuous release
Emission days per year	365

Conditions and measures related to sewage treatment plant	
STP type	Municipal Sewage Treatment Plant Water - minimum efficiency of 67 %
STP effluent	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	No specific measures identified.
Waste disposal methods	For general information on waste disposal see section 13.

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 consumer exposure: Laundry and dish washing products (PC35)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 13 %
Physical form of product	Tablet

Amount used, frequency and duration of use (or from service life)	
Amounts used	20 g/event
Duration	Covers exposure up to: 6 min
Use frequency	1 events per day

Other conditions affecting consumers exposure	
Indoor or outdoor use	Indoor use
Room size	Assumes a room volume of maximum 20 m3
Body parts exposed	Assumes that potential dermal contact is limited to fingertips.
Body weight	60 kg
Breathing volume	33,6 m3/d
Layer thickness	0,01 cm

4.3. Exposure estimation and reference to its source

4.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) (ERC8a)

Release route	Release	Release estimation method
Water	100 %	ERC based
Air	100 %	ERC based
Soil	0 %	ERC based

Compartement	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	EUSES v2.1

4.3.2. Consumer exposure: Laundry and dish washing products (PC35)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

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

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

ES5: Use in flue gas desulphurisation., Industrial

5.1. Title section

Structured Short Title	Use at industrial sites; Processing aids such as pH-regulators, flocculants, precipitants, neutralization agents (PC20); Electricity, steam, gas water supply and sewage treatment (SU23).
Substance	Adipic acid EC-No.: 204-673-3 CAS-No.: 124-04-9

Environmental release category(ies)	ERC8e: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)
Process category(ies)	PROC16: Use of fuels

Contributing Scenario (CS) Environment		
CS1	**Widespread use of reactive processing aid (no inclusion into or onto article, outdoor)**	ERC8e

Contributing Scenario (CS) Worker		
CS2	**Use of fuels**	PROC16
CS3	**Use of fuels; With Local Exhaust Ventilation**	PROC16

5.2. Conditions of use affecting exposure

5.2.1. Control of environmental exposure: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) (ERC8e)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	540 t
Daily amount per site	1,8 t
Release type	Continuous release
Emission days per year	300

Technical and organisational conditions and measures
Suitable technique(s) to limit releases to water: The waste water has to be directed to a dedicated sewage treatment plant or treated by other suitable techniques.
Suitable technique(s) to limit releases to air: Waste air should be scrubbed or filtered. Air - minimum efficiency of 99 %
Suitable technique(s) to limit releases to soil: Floor should be impervious and resistant to liquid.

Conditions and measures related to sewage treatment plant	
STP type	Onsite Sewage Treatment Plant Water - minimum efficiency of 96 %
Additional information on STP	Biological elimination
STP effluent	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	No specific measures identified.
Waste disposal methods	For general information on waste disposal see section 13.

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: Use of fuels (PROC16)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 1 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective cloth- ing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

5.2.3. Control of worker exposure: Use of fuels; With Local Exhaust Ventilation (PROC16)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.
Local exhaust ventilation Inhalation - minimum efficiency of 90 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

5.3. Exposure estimation and reference to its source

5.3.1. Environmental release and exposure: Widespread use of reactive processing aid (no inclusion into or onto article, outdoor) (ERC8e)

Release route	Release	Release estimation method
Water	2 %	ERC based
Air	0,1 %	ERC based
Soil	0 %	ERC based

Compartement	Risk Characterisation Ratio (RCR)	Calculation method
All routes	< 1	EUSES v2.1

5.3.2. Worker exposure: Use of fuels (PROC16)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

5.3.3. Worker exposure: Use of fuels; With Local Exhaust Ventilation (PROC16)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

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

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.

ES6: Use in laboratories, Professional

6.1. Title section

Structured Short Title	Widespread use by professional workers; Laboratory chemicals (PC21).
Substance	Adipic acid EC-No.: 204-673-3 CAS-No.: 124-04-9

Environmental release category(ies)	ERC8a: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor) ERC8b: Widespread use of reactive processing aid (no inclusion into or onto article, indoor)
Process category(ies)	PROC15: Use as laboratory reagent

Contributing Scenario (CS) Environment		
CS1	**Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor); Widespread use of reactive processing aid (no inclusion into or onto article, indoor)**	ERC8a, ERC8b

Contributing Scenario (CS) Worker		
CS2	**Laboratory activities; Solid**	PROC15
CS3	**Laboratory activities; Solid in solution**	PROC15
CS4	**Laboratory activities; Solid in solution; With Local Exhaust Ventilation**	PROC15

6.2. Conditions of use affecting exposure

6.2.1. Control of environmental exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor); Widespread use of reactive processing aid (no inclusion into or onto article, indoor) (ERC8a, ERC8b)

Amount used, frequency and duration of use (or from service life)	
Annual amount per site	< 1 t
Release type	Continuous release
Emission days per year	300

Technical and organisational conditions and measures
Suitable technique(s) to limit releases to water: The waste water has to be directed to a dedicated sewage treatment plant or treated by other suitable techniques. Pre-treatment of waste water by pH-adjustment, flocculation / precipitation, sedimentation.
Suitable technique(s) to limit releases to air: Waste air should be scrubbed or filtered. Air - minimum efficiency of 99 %
Suitable technique(s) to limit releases to soil: Floor should be impervious and resistant to liquid.

Conditions and measures related to sewage treatment plant	
STP type	Onsite Sewage Treatment Plant Water - minimum efficiency of 96 %
Additional information on STP	Biological elimination
STP sludge treatment	Sewage sludge incineration
STP effluent	2.000 m3/d

Conditions and measures related to treatment of waste (including article waste)	
Waste treatment	No specific measures identified.
Waste disposal methods	For general information on waste disposal see section 13.

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: Laboratory activities; Solid (PROC15)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 8 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection. Wear suitable gloves tested to EN374.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective cloth- ing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

6.2.3. Control of worker exposure: Laboratory activities; Solid in solution (PROC15)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 25 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 1 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection. Wear suitable gloves tested to EN374.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective cloth- ing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

6.2.4. Control of worker exposure: Laboratory activities; Solid in solution; With Local Exhaust Ventilation (PROC15)

Product (article) characteristics	
Concentration of substance in product	Covers concentrations up to 100 %
Physical form of product	Solid in solution

Amount used, frequency and duration of use (or from service life)	
Duration	Covers concentrations up to 1 h
Use frequency	240 days per year

Technical and organisational conditions and measures
Only properly trained and authorised personnel shall handle the substance. Substance-handling procedures shall be well documented and supervised.
Local exhaust ventilation Inhalation - minimum efficiency of 80 %

Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable protective clothing. Use suitable eye protection. Wear suitable gloves tested to EN374.
For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure	
Indoor or outdoor use	Indoor use
Temperature	Covers use at ambient temperatures.
Ventilation rate	Indoors with good natural ventilation.

Additional good practice advice. Obligations according to Article 37(4) of REACH do not apply
On possible contact with the product (sampling, spillage, leakage, cleaning): Wear protective clothing, wear protective gloves, wear eye protection and respiratory protection. For further specification, refer to section 8 of the SDS.

6.3. Exposure estimation and reference to its source

6.3.1. Environmental release and exposure: Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor); Widespread use of reactive processing aid (no inclusion into or onto article, indoor) (ERC8a, ERC8b)

Release route	Release	Release estimation method
All routes	0 %	Expert judgement

Compartement	Risk Characterisation Ratio (RCR)	Calculation method
All routes		Qualitative assessment

Additional information on exposure estimation
Qualitative assessment based on the low amounts used. No or negligible emissions to the environment.

6.3.2. Worker exposure: Laboratory activities; Solid (PROC15)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

6.3.3. Worker exposure: Laboratory activities; Solid in solution (PROC15)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

6.3.4. Worker exposure: Laboratory activities; Solid in solution; With Local Exhaust Ventilation (PROC15)

Exposure route	Exposure indicator	Health effect	Risk Characterisation Ratio (RCR)	Calculation method
combined routes	-	-	< 1	ECETOC TRA

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

Guidance to Downstream Users
Fulfilling the above conditions the downstream user is deemed to work safely inside the boundaries set by this exposure scenario. Other conditions should only be considered if the downstream user implements or recommends an exposure scenario which includes as a minimum the conditions described in this exposure scenario.