

SAFETY DATA SHEET

In accordance with the Global Harmonized System requirements.

Alcamizer 5

Aluminium-magnesium-carbonate-hydroxide-perchlorate (hydrate)

1. IDENTIFICATION OF THE MIXTURE AND OF THE COMPANY

1.1 Product identifier

Trade name:	Alcamizer 5
Chemical name of the main active ingredient:	Aluminium-magnesium-carbonate-hydroxide-perchlorate (hydrate)
INDEX number of the main active ingredient as listed in annex VI of EU-CLP:	012-004-00-X, ATP01
EC number of the main active ingredient:	422-150-1
CAS number of the main active ingredient:	-
EU-REACH/CLP reference number of the main/active ingredient:	01-0000016866-58-xxxx

1.2 Relevant identified uses of the mixture and uses advised against

Uses:	Stabilizer in the polymer industry
Uses advised against:	None identified

1.3 Details of the supplier of the safety data sheet

Manufacturer:	Kyowa Chemical Industry Co. Ltd. 4035 Hayashida-cho, Sakaide Kagawa 762-0012, Japan
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Manufacturer/representative, in the EU:	Kisuma Chemicals B.V. P.O. Box 400 9640 AK Veendam The Netherlands Tel no: +31(0)598 666766
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Contact outside the EU:	reach@kisuma.com
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1.4 Emergency telephone number

Kisuma Chemicals BV:
Tel: +31(0)598 666766 (09:00 – 17:00, C.E.T)
National Poisons Information Center, The Netherlands:
Tel: +31 (0)30 2748888 (24h)

2. HAZARD IDENTIFICATION

2.1 Classification of the mixture

This mixture has classification requirements in accordance with GHS/ Regulation (EC) No 1272/2008 (CLP)

Hazard statements:	H400 H410	Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.
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2.2 Label elements

Classification of this mixture in accordance with Regulation (EC) No 1272/2008 (CLP)

Hazard pictogram:



Signal word: Warning:

Hazard statements:	H410	Very toxic to aquatic life with long lasting effects.
Precautionary statements:	P273 P391 P501	Avoid release to the environment. Collect spillage. Dispose of contents/container to authorized waste handling in accordance to national regulations.

2.3 Other hazards

PBT/PvB criteria Not applicable since the main active ingredient is inorganic



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3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/mixture: According to the REACH Regulation the product is a mixture

Information about components:

Chemical name:	EC No. Cas No.	GHS/CLP: Pictogram	GHS/CLP: Hazard statements	Concentration
<i>Aluminium-Magnesium-Carbonate-Hydroxide-Perchlorate-hydrate</i>	422-150-1	GHS09	H410	> 95%
<i>Coating layer based on salts of saturated fatty acids</i>	-	-	-	< 5%

4. FIRST-AID MEASURES

4.1 Description of first aid measures

Eye contact:	Immediately wash eyes with plenty of running water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical advice if irritation develops and persists.
Skin contact:	Wash affected skin area with plenty of water and soap thoroughly while removing contaminated clothing and shoes. Seek medical advice if irritation develops and persists.
Ingestion:	Seek medical advice if the victim feels unwell. Wash out mouth with plenty of water and give 2-4 cupfuls of water or milk to drink. Never give anything by mouth to an unconscious person. Induce vomiting.
Inhalation:	Remove the victim from exposure into fresh air immediately. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical advice if cough or other symptoms appear.

4.2 Most important symptoms and effect

Acute effects	None identified
Delayed effects	None identified

4.3 Indication of any immediate medical attention and special treatment needed

None identified

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing media

Suitable:	Foam, dry powder, carbon dioxide, water mist.
Not suitable:	Not known

5.2 Special hazards arising from the mixture

Under fire situation, this material may generate COx

5.3 Advice for firefighter

In the event of fire, wear a self-contained breathing apparatus and a chemical protective suit.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel
Wear appropriate personal protective equipment (see section 8) during cleaning. Avoid contact with eyes and skin. Avoid inhalation. Avoid dust formation.

6.2 Environmental precautions

Prevent the material from entering surface water or sanitary sewer system. Do not discharge directly to a water source. If accidental spillage or washings enter drains or watercourses contact local Environment Agency.

6.3 Methods and material for containment and cleaning up

Sweep up into suitable containers for recovery or disposal.

7. HANDLING AND STORAGE



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7.1 Precautions for safe handling

Technical measures/ Precautions: Good ventilation (local exhaust) of the working area, safety showers and eye wash station near the workplace. Wear personal protective equipment (see section 8).

General occupation hygiene: Do not eat, drink and smoke in work areas. Wash hands after use and remove contaminated clothing and protective equipment before entering eating areas.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures / storage conditions: Store under dry conditions.

Incompatible products: None known

Packaging material: Store the product in bags, car silos, container,.

7.3 Specific end use(s)

None known

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

Exposure limit values: No Substance specific (inter)national regulations/recommendations
Japan.
Recommendation of Occupational Exposure Limits (OELs)(2007):
Respirable dust - 2mg/m3, Total - 8mg/m3 (JSOH)
USA
Particulates Not Otherwise Regulated (PNOR): 5 mg/m3 Respirable Dust Level (OSHA)
Particulates Not Otherwise Specified (PNOS): 3 mg/m3 Respirable Dust Level (ACGIH)
Germany
General Dust Limit (ASG)
Respirable fraction (A-dust): 3 mg/m3 (8 hr average)
Inhalable fraction (E-dust) : 4 mg/m3 (Yearly average)
Netherlands
Indicative values for non-specific dust:
T_{gg} (8h)= 5 mg/m3 (respirable fraction)
T_{gg} (8h)= 10 mg/m3 (inhalable fraction)
Consult your local authorities for general valid (non substance specific) acceptable exposure recommendations/limits.

Recommended occupational and consumer exposure limit values:

DNEL	Exposure pattern	Derived No-Effect level	
		Workers	General population
	<i>Dermal, Systemic effects - Long-term</i>	0.46 mg/kg bw/day	0.28 mg/kg bw/day
	<i>Dermal, Local effects -Long-term</i>	Low hazard	Low hazard
	<i>Dermal, Local effects -Short-term</i>	Low hazard	Low hazard
	<i>Inhalation, Systemic effects - Long-term</i>	0.65 mg/m3	0.19 mg/m3
	<i>Oral, Systemic effects - Long-term</i>	Not relevant	0.28 mg/kg bw/day
PNEC	Predicted No-Effect Concentration		
	Environmental protection target		PNEC Value
	<i>Freshwater</i>		Insufficient hazard data available
	<i>Marine water</i>		Insufficient hazard data available
	<i>Sediments (fresh water)</i>		Insufficient hazard data available
	<i>Sediments (marine water)</i>		Insufficient hazard data available
	<i>Sewage treatment plant</i>		PNEC STP: 10 mg/l
	<i>Soil</i>		Insufficient hazard data available
	<i>Air</i>		No hazard identified
	<i>Secondary poisoning</i>		No data available

8.2 Exposure controls:

Appropriate engineering controls: Keep exposure to a minimum



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Environmental exposure controls:	Wear appropriate personal protective equipment. Avoid contact with eyes and skin. Avoid inhalation. Local exhaust ventilation of the working area.
Individual protection measures, such as personal protective equipment:	
Respiratory protection:	NIOSH approved.
Hand protection:	Chemical-resistant gloves. Suitable material: Neoprene/nitrile rubber/ rubber Breakthrough time: not determined.
Eye protection:	Safety goggles where splashing is possible.
Skin and body protection:	Normal overall
Hygiene measures:	Wash hands and face before breaks and immediately after handling the product. When using do not eat, drink, or smoke.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties for the active ingredient in the mixture

Appearance:	White Powder
Odour:	Not determined.
pH:	~ 9 (saturation concentration in water)
Melting/Boiling temperature:	Decomposition > 150°C (EC A.1)
Evaporation rate:	Not determined.
Flammability:	Not flammable (EC A.10).
Explosive properties:	Not explosive (EC A.14, based on structure).
Oxidizing properties:	Not oxidizing (EC A.17, based on structure)
Vapour pressure:	0.7 Pa at 20°C (EC A.4, static technique).
Relative Density (D4(20)):	2.16 (EC A.3; gas comparison pycnometer)
Water solubility:	< 2.4 mg/l at 20°C (EC A.6).
Particle size distribution:	D50: 1.61µm (Company data)
Partition coefficient n-octanol/water:	Trying to estimate the log Po/w from the solubilities in water and n-octanol, the results based on Al and Mg appeared to be not in agreement with each other. Other methods for determination of the log Po/w could not be applied.
Decomposition temperature	Decomposition >150°C (EC A.1)
Self heating:	Not self heating (UN test N.4)
Auto ignition temperature:	No self-ignition is expected up to 400 °C (EC A.16).
Surface tension:	74.4 mN/m at 20.0°C(90% saturation concentration in water) (EC A.5: ring method).

9.2 Other information None Known

10. STABILITY AND REACTIVITY

10.1 Reactivity:	Reactive with acids.
10.2 Chemical stability:	Stable under normal conditions.
10.3 Possibility of hazardous reaction:	None known
10.4 Conditions to avoid:	Temperatures > 300 °C.
10.5 Incompatible materials	Acids; pH < 1.
10.6 Hazardous decomposition products	Hazardous decomposition will not occur.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effect for the main, active ingredient in the mixture

ACUTE TOXICITY

Acute oral toxicity: LD50 (rat): >2000 mg/kg (EC B.1 tris)



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Acute dermal toxicity:	LD50 (rat): >2000 mg/kg (EC B.3)
Acute inhalation toxicity:	LC50 (rat): >5.16 mg/l (OECD 403)
LOCAL	
Skin corrosion / Irritation	Not irritating to the skin (rabbit) (EC B.4).
Serious eye damage / eye irritation	Not irritating to the eyes (rabbit) (EC B.5).
Skin sensitization:	No sensitization by skin contact (guinea pig)(EC B.6).
OTHER	
Sub-acute toxicity:	28-day oral gavage (rat): NOAEL: 1000 mg/kg bw/day (EC B.7). Screening Repro/developmental study (rat): LOAEL: 100mg/kg bw/day (OECD 421)
Germ cell mutagenicity:	Bacterial reverse mutation test (<i>S. typhimurium</i>): not mutagenic (EC B.13/14; Ames test). In vitro Mammalian Chromosome aberration (human lymphocytes): not clastogenic (EC B.10) In vitro Gene mutation (L5178Y/TK+ mouse lymphoma cells) not mutagenic (EC B.17).
Reproductive toxicity:	Screening Repro/developmental study (rat): LOAEL: 1000mg/kg bw/day (OECD 421)
Carcinogenicity:	No data available.
STOT-single exposure:	None Known
STOT-repeated exposure:	None Known
OTHER INFORMATION	
Immunology:	no info
Neurotoxicity:	no info
Lung absorption:	no info
Chronic toxicity:	no Info

12. ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION GIVEN IS FOR THE MAIN, ACTIVE INGREDIENT IN THE MIXTURE

12.1 Toxicity

Fish:	LC50 (96h): > 100 mg/l (EC C.1) No mortality or any clinical effects were observed among the fish exposed to filtrates prepared at loading rates up to 100 mg/l.
Daphnia magna:	EC50 (48h): > 100 mg/l (EC C.2) No immobility of Daphnia magna was observed when exposed to the filtrates prepared at loading rates up to 100 mg/l.
Algae:	ErC50 (72h): > 18 mg/l (EC C.3)
Inhibition of microbial activity:	Not toxic to waste water (activated sludge) bacteria at a concentration of 100 mg/l (nominal). 3h-IC50 > 100 mg/l
Marine copepods:	no info

12.2 Persistence and degradability

Biodegradation:	Considered not biodegradable, inorganic substance.
Hydrolysis:	Test is not performed due to the low water solubility.

12.3 Bioaccumulative potential

Octanol-water partition coefficient (Kow):	The partition coefficient can not be calculated.
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12.4 Mobility in soil

Adsorption coefficient	Not performed, inorganic substance.
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12.5 Results of PBT and vPvB assessment

No PBT and vPvB assessment was conducted since the active ingredient in the mixture is inorganic.

13. DISPOSAL CONSIDERATIONS



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13.1 Waste treatment methods

- Waste from residues:** Disposal in accordance with local and national regulations. Do not allow material to contaminate ground water system. Do not contaminate surface water.
- Container:** Containers should be cleaned by appropriate method and then re-used or disposed by landfill or incineration as appropriate, in accordance with local and national regulations. Do not remove label until container is thoroughly cleaned.

14. TRANSPORT INFORMATION

- 14.1 UN Number:** UN 3077
- 14.2 UN Proper shipping name:** Environmentally hazardous substance, solid, n.o.s. (Aluminium Magnesium Carbonate Hydroxide perchlorate (hydrate))
- 14.3 Transport hazard classes:** Class 9
- 14.4 Packing group:** III
- 14.5 Environmental hazards:** Classification code M7: Pollutant to the aquatic environment, solid
- 14.6 Special precautions for user:** None Known
- 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC code:** Not applicable

15. REGULATORY INFORMATION

- 15.1 Safety, health and environmental regulation/legislation specific for the substance or mixture:** The coating agent is exempted from the obligation to register in accordance with Regulation (EC) No 1907/2006, Article 2(7).
Germany WHC(WGK) classification: hazard to waters; WGK 2
Germany TRGS 510 classification: storage class 13; Non-combustible solids
- 15.2 Chemical safety assessment:** For this substance a chemical safety assesment has been carried out

16. OTHER INFORMATION

The information provided in this safety data sheet is correct to the best of our knowledge, information, and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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- Created/revised by:** Kisuma Chemicals BV

EXPOSURE SCENARIOS FOR COMMUNICATION

Substance Name: Aluminium-magnesium-carbonate-hydroxide-perchlorate (hydrate)

EC Number: 422-150-1

Registration Number: 01-0000016866-58-0001

Date of Generation/Revision: 17/10/2018

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1. ES 1: Formulation or re-packing - Formulation into a matrix (into PVC stabilization packs)

1.1. Title section

ES name: Formulation into a matrix (into PVC stabilization packs)

Environment	
1: Formulation into a matrix (into PVC stabilization packs)	ERC 3
Worker	
2: Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC 8b
3: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
4: Formulation of the substance in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC 2
5: Formulation of the substance in batch process with significant exposure	PROC 5
6: Tableting of the formulation	PROC 14
7: Treatment of articles by dipping and pouring	PROC 13

1.2. Conditions of use affecting exposure

1.2.1. Control of environmental exposure: Formulation into a matrix (into PVC stabilization packs) (ERC 3)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 1.0 tonnes/day
Annual amount per site < 100.0 tonnes/year
Conditions and measures related to external treatment of waste (including article waste)
Closed system required to minimize release to the environment during waste treatment.
Other conditions affecting environmental exposure
There's no emission of the substance to the environment. Procedures are in place to regularly verify that there's no emission.

1.2.2. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with basic employee training; If skin

contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands; Dermal - minimum efficiency of 90% (APF of 10); For further specification, refer to section 8 of the SDS.

Other conditions affecting workers exposure

Indoor use

1.2.3. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics
Covers concentrations up to 100.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear chemically resistant gloves (tested to EN374) in combination with basic employee training; If skin contamination is expected to extend to other parts of the body, then these body parts should also be protected with impervious garments in a manner equivalent to those described for the hands; Dermal - minimum efficiency of 90% (APF of 10); For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure
Indoor use

1.2.4. Control of worker exposure: Formulation of the substance in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

1.2.5. Control of worker exposure: Formulation of the substance in batch process with significant exposure (PROC 5)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day

Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

1.2.6. Control of worker exposure: Tableting of the formulation (PROC 14)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

1.2.7. Control of worker exposure: Treatment of articles by dipping and pouring (PROC 13)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

1.3. Exposure estimation and reference to its source

1.3.1. Environmental releases and risks: Formulation into a matrix (into PVC stabilization packs) (ERC 3)

Release route	Release rate after on site RMM	Release estimation method
Water	0 kg/day	Estimated release factor
Air	0 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Risks for the environment are considered to be negligible, as there's no emission of the substance to the environment.

1.3.2. Worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.1 mg/m ³ (TRA Workers 3.0)	0.154
Dermal, systemic, long term	0.034 mg/kg bw/day (MEASE)	0.074
Combined, systemic, long term		0.228

1.3.3. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.1 mg/m ³ (TRA Workers 3.0)	0.154
Dermal, systemic, long term	0.034 mg/kg bw/day (MEASE)	0.074
Combined, systemic, long term		0.228

1.3.4. Worker exposure: Formulation of the substance in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	2E-3 mg/m ³ (TRA Workers 3.0)	< 0.01
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.153

1.3.5. Worker exposure: Formulation of the substance in batch process with significant exposure (PROC 5)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.1 mg/m ³ (TRA Workers 3.0)	0.154
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.304

1.3.6. Worker exposure: Tableting of the formulation (PROC 14)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.02 mg/m ³ (TRA Workers 3.0)	0.031
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.181

1.3.7. Worker exposure: Treatment of articles by dipping and pouring (PROC 13)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.02 mg/m ³ (TRA Workers 3.0)	0.031
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.181

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

For calculating inhalation exposure estimates, the tool ECETOC TRA (v3) was used, taking into account indoor exposure to dust. Some input parameters are scalable, like exposure duration, dustiness, ventilation conditions and the concentration of the substance.

For calculating dermal exposure estimates, the MEASE tool for metals and inorganic substances (v1.02.01) was used, using additionally the following operational conditions:

- Pattern of use: Non-dispersive use (intended to cover most occupational use not specifically assignable to other categories)
- Pattern of exposure control: Direct handling (no full containment and the worker is not separated from the substance)
- Contact level: Extensive (assuming more than 10 exposure events per day)

With the MEASE tool, a total dermal loading per day is calculated (taking into account RMMs if applicable), which is divided by a bodyweight of 70 kg for obtaining the exposure estimate.

Some input parameters are scalable, like these operational conditions, exposure duration, dustiness and the concentration of the substance.

But note that there is a risk of local effects via dermal exposure of the substance (see the DNEL conclusions in Section 8), which is the reason for implementing gloves when the substance is used at or above 10%.

2. ES 2: Use at industrial sites - Use of PVC stabilization packs containing the substance for the processing of PVC

2.1. Title section

ES name: Use of PVC stabilization packs containing the substance for the processing of PVC

Environment	
1: Use of PVC stabilization packs containing the substance for the processing of PVC	ERC 5
Worker	
2: Transfer of substance or mixture (charging and discharging) at dedicated facilities	PROC 8b
3: Transfer of substance or mixture into small containers (dedicated filling line, including weighing)	PROC 9
4: Formulation of the substance in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions	PROC 2
5: Formulation of the substance in batch process with significant exposure	PROC 5
6: Calendering operations	PROC 6
7: Tableting of the formulation	PROC 14
8: Treatment of articles by dipping and pouring	PROC 13
9: Roller application or brushing	PROC 10
Subsequent service life exposure scenario(s)	
ES 3: Service life (worker at industrial site)	

2.2. Conditions of use affecting exposure

2.2.1. Control of environmental exposure: Use of PVC stabilization packs containing the substance for the processing of PVC (ERC 5)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 5.0 tonnes/day
Annual amount per site < 100.0 tonnes/year
Conditions and measures related to external treatment of waste (including article waste)
Closed system required to minimise release to the environment during waste treatment.
Other conditions affecting environmental exposure
There's no emission of the substance to the environment. Procedures are in place to regularly verify that there's no emission.

2.2.2. Control of worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting workers exposure

Indoor use

2.2.3. Control of worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)

Product (Article) characteristics

Covers concentrations up to 5.0 %

Solid, low dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers use up to 8.0 h/day

Technical and organisational conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting workers exposure

Indoor use

2.2.4. Control of worker exposure: Formulation of the substance in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)

Product (Article) characteristics

Covers concentrations up to 5.0 %

Solid, low dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers use up to 8.0 h/day

Technical and organisational conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting workers exposure

Indoor use

2.2.5. Control of worker exposure: Formulation of the substance in batch process with significant exposure (PROC 5)

Product (Article) characteristics

Covers concentrations up to 5.0 %

Solid, low dustiness

Amount used (or contained in articles), frequency and duration of use/exposure

Covers use up to 8.0 h/day

Technical and organisational conditions and measures

Provide a basic standard of general ventilation (1 to 3 air changes per hour).

Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.

Other conditions affecting workers exposure

Indoor use

2.2.6. Control of worker exposure: Calendering operations (PROC 6)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

2.2.7. Control of worker exposure: Tableting of the formulation (PROC 14)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

2.2.8. Control of worker exposure: Treatment of articles by dipping and pouring (PROC 13)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

2.2.9. Control of worker exposure: Roller application or brushing (PROC 10)

Product (Article) characteristics
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Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

2.3. Exposure estimation and reference to its source

2.3.1. Environmental releases and risks: Use of PVC stabilization packs containing the substance for the processing of PVC (ERC 5)

Release route	Release rate after on site RMM	Release estimation method
Water	0 kg/day	Estimated release factor
Air	0 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Risks for the environment are considered to be negligible, as there's no emission of the substance to the environment.

2.3.2. Worker exposure: Transfer of substance or mixture (charging and discharging) at dedicated facilities (PROC 8b)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.02 mg/m ³ (TRA Workers 3.0)	0.031
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.181

2.3.3. Worker exposure: Transfer of substance or mixture into small containers (dedicated filling line, including weighing) (PROC 9)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.02 mg/m ³ (TRA Workers 3.0)	0.031
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.181

2.3.4. Worker exposure: Formulation of the substance in closed continuous process with occasional controlled exposure or processes with equivalent containment conditions (PROC 2)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	2E-3 mg/m ³ (TRA Workers 3.0)	< 0.01
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.153

2.3.5. Worker exposure: Formulation of the substance in batch process with significant exposure (PROC 5)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.1 mg/m ³ (TRA Workers 3.0)	0.154
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.304

2.3.6. Worker exposure: Calendering operations (PROC 6)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.02 mg/m ³ (TRA Workers 3.0)	0.031
Dermal, systemic, long term	0.137 mg/kg bw/day (MEASE)	0.298
Combined, systemic, long term		0.329

2.3.7. Worker exposure: Tableting of the formulation (PROC 14)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.02 mg/m ³ (TRA Workers 3.0)	0.031
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.181

2.3.8. Worker exposure: Treatment of articles by dipping and pouring (PROC 13)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.02 mg/m ³ (TRA Workers 3.0)	0.031
Dermal, systemic, long term	0.069 mg/kg bw/day (MEASE)	0.15
Combined, systemic, long term		0.181

2.3.9. Worker exposure: Roller application or brushing (PROC 10)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.1 mg/m ³ (TRA Workers 3.0)	0.154
Dermal, systemic, long term	0.137 mg/kg bw/day (MEASE)	0.298
Combined, systemic, long term		0.452

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

For calculating inhalation exposure estimates, the tool ECETOC TRA (v3) was used, taking into account indoor exposure to dust. Some input parameters are scalable, like exposure duration, dustiness, ventilation conditions and the concentration of the substance.

For calculating dermal exposure estimates, the MEASE tool for metals and inorganic substances (v1.02.01) was used, using additionally the following operational conditions:

- Pattern of use: Non-dispersive use (intended to cover most occupational use not specifically assignable to other categories)
- Pattern of exposure control: Direct handling (no full containment and the worker is not separated from the substance)
- Contact level: Extensive (assuming more than 10 exposure events per day)

With the MEASE tool, a total dermal loading per day is calculated (taking into account RMMs if applicable), which is divided by a bodyweight of 70 kg for obtaining the exposure estimate.

Some input parameters are scalable, like these operational conditions, exposure duration, dustiness and the concentration of the substance.

But note that there is a risk of local effects via dermal exposure of the substance (see the DNEL conclusions in Section 8), which is the reason for implementing gloves when the substance is used at or above 10%.

3. ES 3: Service life (worker at industrial site) - Service life of articles containing the substance

3.1. Title section

ES name: Service life of articles containing the substance

Environment	
1: Service life of articles containing the substance	ERC 12c
Worker	
2: Low energy manipulation and handling of the substance bound in/on materials or articles	PROC 21
3: High (mechanical) energy work-up of the substance bound in /on materials and/or articles	PROC 24
Exposure scenario of the uses leading to the inclusion of the substance into the article	
ES 2: Use at industrial sites - Use of PVC stabilization packs containing the substance for the processing of PVC	

3.2. Conditions of use affecting exposure

3.2.1. Control of environmental exposure: Service life of articles containing the substance (ERC 12c)

Amount used, frequency and duration of use (or from service life)
Daily amount per site <= 5.0 tonnes/day
Annual amount per site < 100.0 tonnes/year
Conditions and measures related to external treatment of waste (including article waste)
Closed system required to minimise release to the environment during waste treatment.
Other conditions affecting environmental exposure
There's no emission of the substance to the environment. Procedures are in place to regularly verify that there's no emission.

3.2.2. Control of worker exposure: Low energy manipulation and handling of the substance bound in/on materials or articles (PROC 21)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Other conditions affecting workers exposure
Indoor use

3.2.3. Control of worker exposure: High (mechanical) energy work-up of the substance bound in /on materials and/or articles (PROC 24)

Product (Article) characteristics
Covers concentrations up to 5.0 %
Solid, low dustiness
Amount used (or contained in articles), frequency and duration of use/exposure
Covers use up to 8.0 h/day
Technical and organisational conditions and measures
Provide a basic standard of general ventilation (1 to 3 air changes per hour).
Assumes that activities are undertaken with appropriate and well maintained equipment by trained personnel operating under supervision.
Conditions and measures related to personal protection, hygiene and health evaluation
Wear suitable respiratory protection; Inhalation - minimum efficiency of 90% (APF of 10); Given the worker activities, suggesting significant inhalation exposure, it is considered that workers should wear respiratory protection (a dust mask); For further specification, refer to section 8 of the SDS.
Other conditions affecting workers exposure
Indoor use

3.3. Exposure estimation and reference to its source

3.3.1. Environmental releases and risks: Service life of articles containing the substance (ERC 12c)

Release route	Release rate after on site RMM	Release estimation method
Water	0 kg/day	Estimated release factor
Air	0 kg/day	Estimated release factor
Soil	0 kg/day	Estimated release factor

Risks for the environment are considered to be negligible, as there's no emission of the substance to the environment.

3.3.2. Worker exposure: Low energy manipulation and handling of the substance bound in/on materials or articles (PROC 21)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.1 mg/m ³ (MEASE)	0.154
Dermal, systemic, long term	0.28 mg/kg bw/day (MEASE)	0.609
Combined, systemic, long term		0.763

3.3.3. Worker exposure: High (mechanical) energy work-up of the substance bound in /on materials and/or articles (PROC 24)

Route of exposure and type of effects	Exposure estimate	RCR
Inhalation, systemic, long term	0.04 mg/m ³ (MEASE)	0.062
Dermal, systemic, long term	0.28 mg/kg bw/day (MEASE)	0.609
Combined, systemic, long term		0.67

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

For calculating inhalation exposure estimates, the MEASE tool for metals and inorganic substances (v1.02.01) was used, taking into account indoor exposure to dust. Some input parameters are scalable, like exposure duration, dustiness, ventilation conditions and the concentration of the substance.

For calculating dermal exposure estimates, also the MEASE tool was used, using additionally the following operational conditions:

- Pattern of use: Non-dispersive use (intended to cover most occupational use not specifically assignable to other categories)
- Pattern of exposure control: Direct handling (no full containment and the worker is not separated from the substance)
- Contact level: Extensive (assuming more than 10 exposure events per day)

With the MEASE tool, a total dermal loading per day is calculated (taking into account RMMs if applicable), which is divided by a bodyweight of 70 kg for obtaining the exposure estimate.

Some input parameters are scalable, like these operational conditions, exposure duration, dustiness and the concentration of the substance.

But note that there is a risk of local effects via dermal exposure of the substance (see the DNEL conclusions in Section 8), which is the reason for implementing gloves when the substance is used at or above 10%.