PRODUCT SAFETY DATA SHEET

prepared in accordance with Annex II of REACH regulation (EC) 1907/2006, regulation (EC) 1272/2008 and regulation (EC) 453/2010



Trade name:	Semidol [®]	
create date: 01.12.2010	Version: 3 - revision date: 17.03.2015	print date: 17.03.2015

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

1.1 **Product identifier**

Substance name: Synonyms:	Dolomite calcined, Half-burnt dolomite, Calcium magnesium carbonate oxide Dolomite calcined, Half-burnt dolomite, Half-calcined dolomite, Calcium magnesium carbonate oxide, Dolomitic lime
	Please note that this list may not be exhaustive.
Chemical name and formula:	Calcium magnesium carbonate oxide – CaCO ₃ *MgO
Trade name:	Semidol [®]
CAS:	83897-84-1
EINECS:	281-192-5
Molecular Weight:	140.39 g/mol
REACH Registration number:	01-2119474891-28-0001

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

Use of substance - the substance is intended for the following non-exhaustive list of uses: Drinking water treatment, Raw water treatment, Industrial water treatment, Chemical industry

1.2.1 Identified uses

All uses listed in table 1 of the Appendix of this SDS are identified uses.

1.2.2 Uses advised against

No use identified in Table 1 of the Appendix of this SDS is advised against.

1.3 Details of the supplier of the substance or mixture

Name:	Dolomitwerk Jettenberg Schöndorfer GmbH
Address:	Oberjettenberg 8
	D-83458 Schneizlreuth
Phone N°:	0049 / (0)8651 / 9682-0
Fax N°:	0049 / (0)8651 / 9682-26
E-mail of competent person responsible for SDS in the MS or in the EU:	f.krey@dolomitwerk.de

1.4 Emergency telephone number

European Emergency N°:	112
National centre for Prevention and Treatment of Intoxications N°:	Giftnotruf München, Klinikum rechts der Isar
Emergency telephone at the company	0049 / (0)89 / 19240
Available outside office hours:	24 hours

SECTION 2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

2.1.1 Classification according to Regulation (EC) 1272/2008

Skin Irritation 2, H315 Eye Damage 1, H318 **1** +

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STOT Single Exp. 3, H335 - Route of exposure: Inhalation

2.1.2 Classification according to Directive 67/548/EEC

Xi - irritant; R37, R38, R41

2.1.3 Additional information

For full text of H-statements and R-phrases see section 16

2.2 Label elements

2.2.1 Labelling according to Regulation (EC) 1272/2008

Signal word:

Danger





Hazard statements:

H315:	Causes skin irritation
H318:	Causes serious eye damage
H335:	May cause respiratory irritation

Precautionary statements:

r recountionary statem			
P102:	Keep out of reach of children		
P261:	Avoid breathing dust/spray		
P280:	Wear protective gloves/protective clothing/eye protection/face protection		
P302+P352:	IF ON SKIN: Wash with plenty of water		
P304+P340:	IF INHALED: Remove person to fresh air and keep comfortable for breathing		
P305+P351+P338:	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.		
P310:	Immediately call a POISON CENTRE / doctor		
P501:	Dispose of contents/container in accordance with the regional and national regulations		

2.3 Other hazards

The substance does not meet the criteria for PBT or vPvB substance. No other hazards identified.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Main constituent

				-		
CAS-No	EG-No	REACH- Registration- No	Identification name	Ŭ	r according to	Classification according to (EG) Nr. 1272/2008 [CLP]
83897-84-1	281-192-5		Calcium magnesium carbonat oxid	> 99 %	Xi, R37, R38, R41	Skin irritation 2 H315 Eye damage 1 H318 STOT SE 3 (Inhalation) H335

Impurities

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No impurities relevant for classification and labelling.

SECTION 4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice

No known delayed effects. Consult a physician for all exposures except for minor instances.

Following inhalation

Move source of dust or move person to fresh air.

Following skin contact

Carefully and gently brush the contaminated body surfaces in order to remove all traces of product. Wash affected area immediately with plenty of water. Remove contaminated clothing. If necessary seek medical advice.

Following eye contact

Rinse eyes immediately with plenty of water; remove contact lenses, if present and easy to do. Continue rinsing. Seek medical advice.

After ingestion

Clean mouth with water and drink afterwards plenty of water. Do NOT induce vomiting. Obtain medical attention.

4.2 Most important symptoms and effects, both acute and delayed

Calcined dolomite is not acutely toxic via the oral, dermal, or inhalation route. The substance is classified as irritating to skin and the respiratory tract, and entails a risk of serious damage to the eye. There is no concern for adverse systemic effects because local effects (pH-effect) are the major health hazard.

4.3 Indication of any immediate medical attention and special treatment needed

Follow the advises given in section 4.1

SECTION 5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

5.1.1 Suitable extinguishing media

Suitable extinguishing media: The product is not combustible. Use a dry powder, foam or CO_2 fire extinguisher to extinguish the surrounding fire.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

5.1.2 Unsuitable extinguishing media

Do not use water.

5.2 Special hazards arising from the substance or mixture

None

5.3 Advice for fire fighters

Avoid generation of dust. Use breathing apparatus. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

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SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Ensure adequate ventilation.

Keep dust levels to a minimum.

Keep unprotected persons away.

Avoid contact with skin, eyes, and clothing - wear suitable protective equipment (see section 8).

Avoid inhalation of dust – ensure that sufficient ventilation or suitable respiratory protective equipment is used, wear suitable protective equipment (see section 8).

6.1.2 For emergency responders

Ensure adequate ventilation.

Keep dust levels to a minimum.

Keep unprotected persons away.

Avoid contact with skin, eyes, and clothing - wear suitable protective equipment (see section 8).

Avoid inhalation of dust – ensure that sufficient ventilation or suitable respiratory protective equipment is used, wear suitable protective equipment (see section 8).

6.2 Environmental precautions

Contain the spillage. Keep the material dry if possible. Cover area if possible to avoid unnecessary dust hazard. Avoid uncontrolled spills to watercourses and drains (pH increase). Any large spillage into watercourses must be alerted to the Environment Agency or other regulatory body.

6.3 Methods and material for containment and cleaning up

In all cases avoid dust formation.

Keep the material dry if possible.

Pick up the product mechanically in a dry way.

Use vacuum suction unit, or shovel into bags.

6.4 Reference to other sections

For more information on exposure controls/personal protection or disposal considerations, please check section 8 and 13 and the annex of this safety data sheet.

SECTION 7. HANDLING AND STORAGE

7.1 Precautions for safe handling

7.1.1 Protective measures

Avoid contact with skin and eyes. Wear protective equipment (refer to section 8 of this safety data sheet). Do not wear contact lenses when handling this product. It is also advisable to have individual pocket eyewash. Keep dust levels to a minimum. Minimize dust generation. Enclose dust sources, use exhaust ventilation (dust collector at handling points). Handling systems should preferably be enclosed. When handling bags usual precautions should be paid to the risks outlined in the Council Directive 90/269/EEC.

7.1.2 Advice on general occupational hygiene

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

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7.2 Conditions for safe storage, including any incompatibilities

The substance should be stored under dry conditions. Any contact with air and moisture should be avoided. Bulk storage should be in purpose – designed silos. Keep away from acids, significant quantities of paper, straw, and nitro compounds. Keep out of reach of children. Do not use aluminium for transport or storage if there is a risk of contact with water.

7.3 Specific end use(s)

Please check the identified uses in table 1 of the Appendix of this SDS.

For more information please see the relevant exposure scenario, available via your supplier/given in the Appendix, and check section 2.1: Control of worker exposure.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

DNELs:

_	Workers			
Route of exposure	Acute effects local Acute effects systemic Chronic effects local Chronic effects systemic			
Oral	Not required			
Inhalation	4 mg/m ³ (respirable dust)	No hazard identified	1 mg/m ³ (respirable dust)	No hazard identified
Dermal	Hazard identified but no DNEL available	No hazard identified	Hazard identified but no DNEL available	No hazard identified

	Consumers			
Route of exposure	Acute effects local	Acute effects systemic	Chronic effects local	Chronic effects systemic
Oral	No exposure expected	No hazard identified	No exposure expected	No hazard identified
Inhalation	4 mg/m ³ (respirable dust)	No hazard identified	1 mg/m³ (respirable dust)	No hazard identified
Dermal	Hazard identified but no DNEL available	No hazard identified	Hazard identified but no DNEL available	No hazard identified

PNECs:

Environmental protection target	PNEC	Remarks
Fresh water	0,47 mg/l	
Fresh water sediments	No PNEC available	Insufficient data available
Marine water	0,32 mg(l	
Marine sediments	No PNEC available	Insufficient data available
Food (bioaccumulation)	No hazard identified	No potential for bioaccumulation
Microorganismens in sewage treatment	3 mg/l	
Soil (agricultural)	1080 mg/kg soil dw	

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Air	No hazard identified	

National OELs for the substance: not available

8.2 Exposure controls

To control potential exposures, generation of dust should be avoided. Further, appropriate protective equipment is recommended. Eye protection equipment (e.g. goggles or visors) must be worn, unless potential contact with the eye can be excluded by the nature and type of application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required to be worn as appropriate. Please check the relevant exposure scenario, given in the Appendix/available via your supplier.

8.2.1 Appropriate engineering controls

If user operations generate dust, use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne dust levels below recommended exposure limits.

8.2.2 Individual protection measures, such as personal protective equipment

8.2.2.1 Eye/face protection

Do not wear contact lenses. For powders, tight fitting goggles with side shields, or wide vision full goggles. It is also advisable to have individual pocket eyewash.

8.2.2.2 Skin protection

Since calcined dolomite is classified as irritating to skin, dermal exposure has to be minimised as far as technically feasible. The use of protective gloves (nitrile), protective standard working clothes fully covering skin, full length trousers, long sleeved overalls, with close fittings at openings and shoes resistant to caustics and avoiding dust penetration are required to be worn.

8.2.2.3 Respiratory protection

Local ventilation to keep levels below established threshold values is recommended. A suitable particle filter mask is recommended, depending on the expected exposure levels - please check the relevant exposure scenario, given in the Appendix / available via your supplier.

8.2.2.4 Thermal hazards

The substance does not represent a thermal hazard, thus special consideration is not required.

8.2.3 Environmental exposure controls

All ventilation systems should be filtered before discharge to atmosphere.

Avoid releasing to the environment.

Contain the spillage. Any large spillage into watercourses must be alerted to the regulatory authority responsible for environmental protection or other regulatory body.

For detailed explanations of the risk management measures that adequately control exposure of the environment to the substance please check the relevant exposure scenario, available via your supplier. For further detailed information, please check the Appendix of this SDS.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance:	white till pale grey solid material of varying sizes: granular or fine powders
Odour:	odourless
Odour threshold:	not applicable
pH:	10.6 (saturated solution at 20 °C)

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Melting point:	> 450 °C (study result, EU A.1 method)	
Boiling point:	not applicable (solid with a melting point > 450 °C)	
Flash point:	not applicable (solid with a melting point > 450 °C)	
Evaporation rate:	not applicable (solid with a melting point > 450 °C)	
Flammability:	non flammable (study result, EU A.10 method)	
Explosive limits:	non explosive (void of any chemical structures commor explosive properties)	nly associated with
Vapour pressure:	not applicable (solid with a melting point > 450 °C)	
Vapour density:	not applicable	
Relative density:	2.76 (study result, EU A.3 method)	
Solubility in water:	Slightly soluble (study result, EU A.6 method)	
Partition coefficient:	not applicable (inorganic substance)	
Auto ignition temperature:	no relative self-ignition temperature below 400 °C (stud method)	y result, EU A.16
Decomposition temperature:	not applicable (> 600 °C liberation of carbon dioxide)	
Viscosity:	not applicable (solid with a melting point > 450 °C)	
Oxidising properties:	no oxidising properties (Based on the chemical structur does not contain a surplus of oxygen or any structural g correlated with a tendency to react exothermally with co	groups known to be

9.2 Other information

Not available

SECTION 10. STABILITY AND REACTIVITY

10.1 Reactivity

Slightly soluble.

10.2 Chemical stability

Under normal conditions of use and storage, calcined dolomite is stable.

10.3 Possibility of hazardous reactions

Calcium magnesium carbonate oxide reacts exothermically with acids.

When heated above 600 °C, calcium magnesium carbonate oxide decomposes to produce calcium oxide (CaO) and carbon dioxide (CO₂). Calcium oxide reacts with water and generates heat. This may cause risk to flammable material.

10.4 Conditions to avoid

None

10.5 Incompatible materials

Calcium oxide reacts exothermically with acids to form salts and carbon dioxide.

10.6 Hazardous decomposition products

None.

Further information:

When heated above 600 °C, calcium magnesium carbonate oxide decomposes to produce calcium oxide (CaO) and carbon dioxide (CO₂).

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Calcined dolomite absorbs moisture and carbon dioxide from air to form calcium magnesium carbonate (dolomite), which is a common material in nature.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	Oral	LD_{50} > 2000 mg/kg bw (OECD 425, rat, test substances: CaMgO ₂ and CaMg(OH) ₄). By read across these results are also applicable to calcined dolomite
	Dermal	no data available
	Inhalation	no data available
	Calcined dolor	mite is not acutely toxic.
	Classification	for acute toxicity is not warranted.
Skin corrosion / irritation		roxide is irritating to skin (OECD 404, <i>in vivo</i> , rabbit). By read across are also applicable to calcined dolomite.
	calcined dolor	erimental results on similar substances utilized by read-across, nite requires classification as irritating to skin [R38, irritating to skin; 315 – Causes skin irritation)].
Serious eye damage / irritation		reversible lesions in the eye (OECD 405, <i>in vivo</i> , rabbit). By read results are also applicable to calcined dolomite.
	calcined dolor	erimental results on a similar substance utilized by read-across, nite requires classification as severely irritating to the eye [R41, Risk nage to eye; Eye Damage 1 (H318 - Causes serious eye damage)].
Respiratory or skin sensitisation	based on the	able. Calcined dolomite is considered not to be a skin sensitiser, nature of the effect (pH shift) and the essential requirement of nagnesium for human nutrition.
	Classification	for sensitisation is not warranted.
Germ cell mutagenicity		dication for genotoxic/mutagenic effects of either calcium dihydroxide m or magnesium salts in <i>in vitro</i> studies (gene mutation in bacteria).
	non-relevance obviously void	omnipresence and essentiality of Ca and Mg and of the physiological of any pH shift induced in aqueous media, calcined dolomite is of any genotoxic potential including germ cell mutagenicity. for genotoxicity is not warranted.
Carcinogenicity	Both calcium ((administered as Ca-lactate) and magnesium (administered as Mg- not carcinogenic (experimental results, rat/mouse).
	,	of calcined dolomite does not give rise to a carcinogenic risk.
		niological data support lack of any carcinogenic potential of calcined
		for carcinogenicity is not warranted.
Reproductive toxicity	Both calcium ((administered as Ca-carbonate) and magnesium (administered as are not toxic to reproduction (experimental results, mouse/rat).
	The pH effect	does not give rise to a reproductive risk.
	Human epider of calcined do	niological data support lack of any potential for reproductive toxicity lomite.
	reproductive of Committee on	I studies and human clinical studies on various calcium salts no or developmental effects were detected. Also see the Scientific Food (Section 16.6). Thus, calcined dolomite is not toxic for and/or development.
	Classification required.	for reproductive toxicity according to regulation (EC) 1272/2008 is not

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STOT-single exposure	From human data it is concluded that CaO and Ca(OH)2 are in respiratory tract. This is applicable to calcined dolomite by read	
	As summarised and evaluated in the SCOEL recommendation based on human data calcined dolomite is classified as irritatin system by read-across from CaO and Ca(OH)2 [R37, Irritating system; STOT SE 3 (H335 – May cause respiratory irritation)].	g to the respiratory
STOT-repeated exposure	Toxicity of calcium and magnesium via the oral route is addres levels (UL) for adults determined by the Scientific Committee o	
	UL = 2500 mg/d, corresponding to 36 mg/kg bw/d (70 kg perso UL = 250 mg/d, corresponding to 3.6 mg/kg bw/d (70 kg persor	
	Toxicity of calcined dolomite via the dermal route is not conside view of the anticipated insignificant absorption through skin and irritation as the primary health effect (pH shift).	
	Toxicity of calcined dolomite via inhalation (local effect, irritation membranes) is addressed by an 8-h TWA determined by the S on Occupational Exposure Limits (SCOEL) of 1 mg/m ³ respirate from calcium oxide and calcium dihydroxide; see Section 8.1).	cientific Committee
	Therefore, classification of calcined dolomite for toxicity upon p is not required.	prolonged exposure
Aspiration hazard	Calcined dolomite is not known to present an aspiration hazard	ł.

SECTION 12. ECOLOGICAL INFORMATION

12.1 Toxicity

12.1.1 Acute/Prolonged toxicity to fish			
LC ₅₀ (96h) for freshwater fish:	50.6	mg/l (calcium dihydroxide)	
LC_{50} (96h) for marine water fish:	457	mg/l (calcium dihydroxide)	
12.1.2Acute/Prolonged toxicity to aquatic invert	ebrates		
EC ₅₀ (48h) for freshwater invertebrates:	49.1	mg/l (calcium dihydroxide)	
LC_{50} (96h) for marine water invertebrates:	158	mg/l (calcium dihydroxide)	
12.1.3Acute/Prolonged toxicity to aquatic plants	;		
EC ₅₀ (72h) for freshwater algae:	184.57	mg/l (calcium dihydroxide)	
NOEC (72h) for freshwater algae:	48	mg/l (calcium dihydroxide)	
12.1.4Toxicity to micro-organisms e.g. bacteria			
At high concentration, calcined dolomite causes rise	e pH value		
12.1.5Chronic toxicity to aquatic organisms			
NOEC (14d) for marine water invertebrates:	32	mg/l (calcium dihydroxide)	
12.1.6Toxicity to soil dwelling organisms			
EC10/LC10 or NOEC for soil macroorganisms:	2000	mg/kg soil dw (calcium dihydroxide)	
EC_{10}/LC_{10} or NOEC for soil microorganisms:	12000	mg/kg soil dw (calcium dihydroxide)	
12.1.7Toxicity to terrestrial plants			
NOEC (21d) for terrestrial plants:	1080	mg/kg (calcium dihydroxide)	

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12.1.8 Further information

The results by read across are also applicable to Calcium magnesium carbonate Oxide, since in contact with moisture calcium hydroxide is formed.

12.2 Persistence and degradability

Not relevant for inorganic substances

12.3 Bioaccumulative potential

Not relevant for inorganic substances

12.4 Mobility in soil

Calcined dolomite reacts with water and/or carbon dioxide to form respectively calcium dihydroxide and/or calcium carbonate, which are sparingly soluble, and present a low mobility in most soils.

12.5 Results of PBT and vPvB assessment

Not relevant for inorganic substances

12.6 Other adverse effects

No other adverse effects are identified

SECTION 13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Disposal of calcined dolomite should be in accordance with local and national legislation. Processing, use or contamination of this product may change the waste management options. Dispose of container and unused contents in accordance with applicable member state and local requirements.

The used packing is only meant for packing this product; it should not be reused for other purposes. After usage, empty the packing completely.

SECTION 14. TRANSPORT INFORMATION

Calcined dolomite is not classified as hazardous for transport ADR (Road), RID (Rail), ICAO/IATA (Air), AND (Inland waterways) and IMDG (Sea)

14.1 UN-Number

Not regulated

14.2 UN proper shipping name

Not regulated

14.3 Transport hazard class(es)

Not regulated

14.4 Packing group

Not regulated

14.5 Environmental hazards

None

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14.6 Special precautions for user

Avoid any release of dust during transportation, by using air-tight tanks for powders and covered trucks for pebbles.

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not regulated

SECTION 15. REGULATORY INFORMATION

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

Authorisations:	Not required
Restrictions on use:	None
Other EU regulations:	Calcined dolomite is not a SEVESO substance, not an ozone depleting substance and not a persistent organic pollutant.
National regulations:	Water endangering class 1 (Germany)
Storage class:	LGK 13 according to TRGS 510 (non-combustible solids)

15.2 Chemical safety assessment

A chemical safety assessment has been carried out for this substance.

SECTION 16. OTHER INFORMATION

Data are based on our latest knowledge but do not constitute a guarantee for any specific product features and do not establish a legally valid contractual relationship.

16.1 Hazard Statements

- H315: Causes skin irritation
- H318: Causes serious eye damage
- H335: May cause respiratory irritation

16.2 Precautionary Statements

P102:	Keep out of reach of children						
P280:	Wear protective gloves/protective clothing/eye protection/face protection						
P305+P351+P338:	IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if esent and easy to do. Continue rinsing.						
P302+P352:	IF ON SKIN: Wash with plenty of soap and water						
P310:	Immediately call a POISON CENTRE or doctor/physician						
P261:	Avoid breathing dust/fume/gas/mist/vapours/spray						
P304+P340:	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing						
P501:	Dispose of contents/container in accordance with local / regional / national / international regulation (<i>to be specified</i>)						

16.3 Risk Phrases

- R37: Irritating to respiratory system
- R38: Irritating to skin
- R41: Risk of serious damage to eyes

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16.4 Safety Phrases

- S2: Keep out of the reach of children
- S25: Avoid contact with eyes
- S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
- S37: Wear suitable gloves
- S39: Wear eye/face protection

16.5 Abbreviations

- EC₅₀: median effective concentration
- LC₅₀: median lethal concentration
- LD₅₀: median lethal dose
- NOEC: no observable effect concentration
- OEL: occupational exposure limit
- PBT: persistent, bioaccumulative, toxic chemical
- PNEC: predicted no-effect concentration
- STEL: short-term exposure limit
- TWA: time weighted average
- vPvB: very persistent, very bioaccumulative chemical

16.6 Key literature references

Anonymous, 2006: Tolerable upper intake levels for vitamins and minerals Scientific Committee on Food, European Food Safety Authority, ISBN: 92-9199-014-0 [SCF document]

Anonymous, 2008: Recommendation from the Scientific Committee on Occupational Exposure Limits (SCOEL) for calcium oxide (CaO) and calcium dihydroxide (Ca(OH)₂), European Commission, DG Employment, Social Affairs and Equal Opportunities, SCOEL/SUM/137 February 2008

16.7 Revision

Compared to previous version the following sections have been revised:

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

Disclaimer

This safety data sheet (SDS) is based on the legal provisions of the REACH Regulation (EC 1907/2006; article 31 and Annex II), as amended. Its contents are intended as a guide to the appropriate precautionary handling of the material. It is the responsibility of recipients of this SDS to ensure that the information contained therein is properly read and understood by all people who may use, handle, dispose or in any way come in contact with the product. Information and instructions provided in this SDS are based on the current state of scientific and technical knowledge at the date of issue indicated. It should not be construed as any guarantee of technical performance, suitability for particular applications, and does not establish a legally valid contractual relationship. This version of the SDS supersedes all previous versions.

Safety data sheet is continued with:

APPENDIX: Exposure scenarios 9.1 till 9.16 for half calcined dolomite (81 pages)

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End of the safety Data Sheet



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print date: 09.12.2010

APPENDIX: EXPOSURE SCENARIOS

The current document includes all relevant occupational and environmental exposure scenarios (ES) for the production and use of calcium magnesium carbonate oxide (calcium magnesium carbonate oxide) as required under the REACH Regulation (Regulation (EC) No 1907/2006). For the development of the ES the Regulation and the relevant REACH Guidance have been considered. For the description of the covered uses and processes, the "R.12 – Use descriptor system" guidance (Version: 2, March 2010, ECHA-2010-G-05-EN), for the description and implementation of risk management measures (RMM) the "R.13 – Risk management measures" guidance (Version: 1.1, May 2008), for the occupational exposure estimation the "R.14 – Occupational exposure estimation" guidance (Version: 2, May 2010, ECHA-2010-G-09-EN) and for the actual environmental exposure assessment the "R.16 – Environmental Exposure Assessment" (Version: 2, May 2010, ECHA-10-G-06-EN) was used.

Methodology used for environmental exposure assessment

The environmental exposure scenarios only address the assessment at the local scale, including municipal sewage treatment plants (STPs) or industrial waste water treatment plants (WWTPs) when applicable, for industrial and professional uses as any effects that might occur is expected to take place on a local scale.

1) Industrial uses (local scale)

The exposure and risk assessment is only relevant for the aquatic environment, when applicable including STPs/WWTPs, as emissions in the industrial stages mainly apply to (waste) water. The aquatic effect and risk assessment only deal with the effect on organisms/ecosystems due to possible pH changes related to OH⁻ discharges. The exposure assessment for the aquatic environment only deals with the possible pH changes in STP effluent and surface water related to the OH⁻ discharges at the local scale and is performed by assessing the resulting pH impact: the surface water pH should not increase above 9 (In general, most aquatic organisms can tolerate pH values in the range of 6-9).

Risk management measures related to the environment aim to avoid discharging calcium magnesium carbonate oxide solutions into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH changes. Regular control of the pH value during introduction into open waters is required. Discharges should be carried out such that pH changes in receiving surface waters are minimised. The effluent pH is normally measured and can be neutralised easily, as often required by national laws.

2) Professional uses (local scale)

The exposure and risk assessment is only relevant for the aquatic and terrestrial environment. The aquatic effect and risk assessment is determined by the pH effect. Nevertheless, the classical risk characterisation ratio (RCR), based on PEC (predicted environmental concentration) and PNEC (predicted no effect concentration) is calculated. The professional uses on a local scale refer to applications on agricultural or urban soil. The environmental exposure is assessed based on data and a modelling tool. The modelling FOCUS/ Exposit tool is used to assess terrestrial and aquatic exposure (typically conceived for biocidal applications).

Details and scaling approach indications are reported in the specific scenarios.

Methodology used for occupational exposure assessment

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By definition an exposure scenario (ES) has to describe under which operational conditions (OC) and risk management measure (RMMs) the substance can be handled safely. This is demonstrated if the estimated exposure level is below the respective derived no-effect level (DNEL), which is expressed in the risk characterisation ratio (RCR).

For workers, the repeated dose DNEL for inhalation as well as the acute DNEL for inhalation are based on the respective recommendations of the scientific committee on occupational exposure limits (SCOEL) being 1 mg/m³ and 4 mg/m³, respectively.

In cases where neither measured data nor analogous data are available, occupational exposure is assessed with the aid of a modelling tool. At the first tier screening level, the MEASE tool (<u>http://www.ebrc.de/mease.html</u>) is used to assess inhalation exposure according to the ECHA guidance (R.14).

Since the SCOEL recommendation refers to <u>respirable dust</u> while the exposure estimates in MEASE reflect the <u>inhalable</u> fraction, an additional safety margin is inherently included in the exposure scenarios below when MEASE has been used to derive exposure estimates.

Methodology used for consumer exposure assessment

By definition an ES has to describe under which conditions the substances, preparation or articles can be handled safely. In cases where neither measured data nor analogous data are available, exposure is assessed with the aid of a modelling tool.

For consumers, the repeated dose DNEL for inhalation as well as the acute DNEL for inhalation are based on the respective recommendations of the Scientific Committee on Occupational Exposure Limits (SCOEL), being 1 mg/m³ and 4 mg/m³, respectively.

For inhalation exposure to powders the data, derived from van Hemmen (van Hemmen, 1992: Agricultural pesticide exposure data bases for risk assessment. Rev Environ Contam Toxicol. 126: 1-85.), has been used to calculate the inhalation exposure. The inhalation exposure for consumers is estimated at 15 μ g/hr or 0.25 μ g/min. For larger tasks the inhalation exposure is expected to be higher. A factor of 10 is suggested when the product amount exceeds 2.5 kg, resulting in the inhalation exposure of 150 μ g/hr. To convert these values in mg/m³ a default value of 1.25 m³/hr for the breathing volume under light working conditions will be assumed (van Hemmen, 1992) giving 12 μ g/m³ for small tasks and 120 μ g/m³ for larger tasks.

When the preparation or substance is applied in granular form or as tablets, reduced exposure to dust was assumed. To take this into account if data about particle size distribution and attrition of the granule are lacking, the model for powder formulations is used, assuming a reduction in dust formation by 10 % according to Becks and Falks (Manual for the authorisation of pesticides. Plant protection products. Chapter 4 Human toxicology; risk operator, worker and bystander, version 1.0., 2006).

For dermal exposure and exposure to the eye a qualitative approach has been followed, as no DNEL could be derived for this route due to the irritating properties of calcium oxide. Oral exposure was not assessed as this is not a foreseeable route of exposure regarding the uses addressed.

Since the SCOEL recommendation refers to respirable dust while the exposure estimates by the model from van Hemmen reflect the inhalable fraction, an additional safety margin is inherently included in the exposure scenarios below, i.e. the exposure estimates are very conservative.

The exposure assessment of calcium magnesium carbonate oxide professional and industrial and consumer use is performed and organized based on several scenarios. An overview of the scenarios and the coverage of substance life cycle is presented in Table 1.

Trade name:

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Table 1: Overview on exposure scenarios and coverage of substance life cycle

			lde use	ntifi es	ed	Resultin g life cycle stage	tified Use			Process	Article	Environmental
ES number	Exposure scenario title	Manufacture	Formulation	End use	Consumer	Service life (for articles)	Linked to Identified	Sector of use category (SU)	Chemical Product Category (PC)	category (PROC)	categor y (AC)	release category (ERC)
9.1	Manufacture and industrial uses of aqueous solutions of lime substances	x	x	x		х	1	3; 1, 2a, 2b, 4, 5, 6a, 6b, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7, 12a, 12b, 10a, 10b, 11a, 11b
9.2	Manufacture and industrial uses of low dusty solids/powders of lime substances	x	x	x		х	2	3; 1, 2a, 2b, 4, 5, 6a, 6b, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27a, 27b	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7, 12a, 12b, 10a, 10b, 11a, 11b
9.3	Manufacture and industrial uses of medium dusty solids/powders of lime substances	x	x	x		х	3	3; 1, 2a, 2b, 4, 5, 6a, 6b, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 27a, 27b	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7, 12a, 12b, 10a, 10b, 11a, 11b

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			lde use	entifi es	ed	Resultin g life cycle stage	tified Use			Process	Article	Environmental
ES number	Exposure scenario title	Manufacture	Formulation	End use	Consumer	Service life (for articles)	Linked to Identified	Sector of use category (SU)	Chemical Product Category (PC)	category (PROC)	categor y (AC)	release category (ERC)
9.4	Manufacture and industrial uses of high dusty solids/powders of lime substances	x	x	x		x	4	3; 1, 2a, 2b, 4, 5, 6a, 6b, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 27a, 27b	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7, 12a, 12b, 10a, 11a
9.5	Manufacture and industrial uses of massive objects containing lime substances	x	x	x		x	5	3; 1, 2a, 2b, 4, 5, 6a, 6b, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	6, 14, 21, 22, 23, 24, 25	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	1, 2, 3, 4, 5, 6a, 6b, 6c, 6d, 7, 12a, 12b, 10a, 10b, 11a, 11b
9.6	Professional uses of aqueous solutions of lime substances		x	x		x	6	22; 1, 5, 6a, 6b, 7, 10, 11, 12, 13, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	2, 3, 4, 5, 8a, 8b, 9, 10, 12, 13, 15, 16, 17, 18, 19	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	2, 8a, 8b, 8c, 8d, 8e, 8f
9.7	Professional uses of low dusty solids/powders of lime substances		x	x		х	7	22; 1, 5, 6a, 6b, 7, 10, 11, 12, 13, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	2, 3, 4, 5, 8a, 8b, 9, 10, 13, 15, 16, 17, 18, 19, 21, 25, 26	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	2, 8a, 8b, 8c, 8d, 8e, 8f

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				Identified uses		Resultin g life cycle stage	ified Use			Process	Article	Environmental
ES number	Exposure scenario title	Manufacture	Formulation	End use	Consumer	Service life (for articles)	Linked to Identified Use	Sector of use category (SU)	Chemical Product Category (PC)	category (PROC)	categor y (AC)	release category (ERC)
9.8	Professional uses of medium dusty solids/powders of lime substances		x	x		x	8	22; 1, 5, 6a, 6b, 7, 10, 11, 12, 13, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	2, 3, 4, 5, 8a, 8b, 9, 10, 13, 15, 16, 17, 18, 19, 25, 26	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	2, 8a, 8b, 8c, 8d, 8e, 8f, 9a, 9b
9.9	Professional uses of high dusty solids/powders of lime substances		x	x		x	9	22; 1, 5, 6a, 6b, 7, 10, 11, 12, 13, 16, 17, 18, 19, 20, 23, 24	1, 2, 3, 7, 8, 9a, 9b, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40	2, 3, 4, 5, 8a, 8b, 9, 10, 13, 15, 16, 17, 18, 19, 25, 26	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	2, 8a, 8b, 8c, 8d, 8e, 8f
9.10	Professional use of lime substances in soil treatment		x	x			10	22	9b	5, 8b, 11, 26		2, 8a, 8b, 8c, 8d, 8e, 8f
9.11	Professional uses of articles/container s containing lime substances			x		x	11	22; 1, 5, 6a, 6b, 7, 10, 11, 12, 13, 16, 17, 18, 19, 20, 23, 24		0, 21, 24, 25	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13	10a, 11a, 11b, 12a, 12b

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			lde use	ntifi es	ed	Resultin g life cycle stage	tified Use			Process	Article	Environmental
ES number	Exposure scenario title	Manufacture	Formulation	End use	Consumer	Service life (for articles)	Linked to Identified Use	Sector of use category (SU)	Chemical Product Category (PC)	category (PROC)	categor y (AC)	release category (ERC)
9.12	Consumer use of building and construction material (DIY)				x		x	21	9b, 9a			8
9.13	Consumer use of CO ₂ absorbent in breathing apparatuses				x		x	21	2			8
9.14	Consumer use of garden lime/fertilizer				x		x	21	20, 12			8e
9.15	Consumer use of lime substances as water treatment chemicals in aquaria				x		x	21	20, 37			8
9.16	Consumer use of cosmetics containing lime substances				x		x	21	39			8

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ES number 9.1: Manufacture and industrial uses of aqueous solutions of lime substances

Exposure Scenario	Format (1) addressing uses carried out by	y workers					
1. Title							
Free short title	Manufacture and industrial uses of aqueous solutions of lime substances						
Systematic title based on use descriptor	SU3, SU1, SU2a, SU2b, SU4, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU23, SU24 PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC36, PC37, PC38, PC39, PC40 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13 (appropriate PROCs and ERCs are given in Section 2 below)						
Processes, tasks and/or activities covered	Processes, tasks and/or activities cov	ered are described in Section 2 below.					
Assessment Method	The assessment of inhalation exposure is ba	sed on the exposure estimation tool MEASE.					
2. Operational cond	itions and risk management measures						
PROC/ERC	REACH definition	Involved tasks					
PROC 1	Use in closed process, no likelihood of exposure						
PROC 2	Use in closed, continuous process with occasional controlled exposure						
PROC 3	Use in closed batch process (synthesis or formulation)						
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises						
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)						
PROC 7	Industrial spraying]					
PROC 8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities						
PROC 8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities						
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Further information is provided in the ECHA Guidance on information requirements and chemical					
PROC 10	Roller application or brushing	safety assessment, Chapter R.12: Use descriptor system (ECHA-2010-G-05-EN).					
PROC 12	Use of blowing agents in manufacture of foam						
PROC 13	Treatment of articles by dipping and pouring						
PROC 14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation						
PROC 15	Use as laboratory reagent						
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected						
PROC 17	Lubrication at high energy conditions and in partly open process						
PROC 18	Greasing at high energy conditions						
PROC 19	Hand-mixing with intimate contact and only PPE available						
ERC 1-7, 12	Manufacture, formulation and all types of industrial uses						
ERC 10, 11	Wide-dispersive outdoor and indoor use of long-life articles and materials						

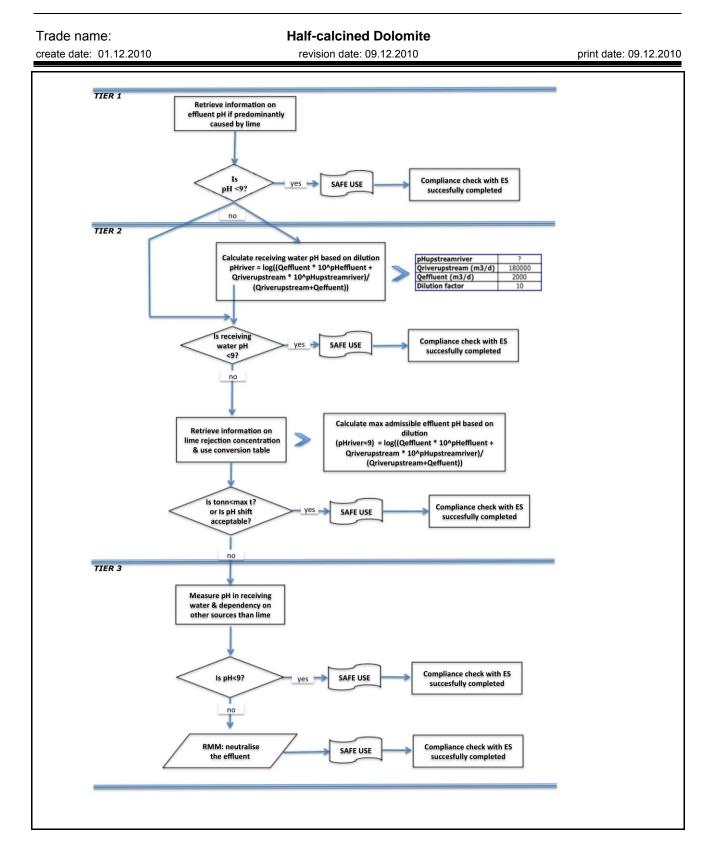
2.1 Control of work	ers exposure						
Product characteristic							
reflected by an assignmer temperature the fugacity is taking into account the pro	approach, the substance-intr to f a so-called fugacity clas s based on the dustiness of t ocess temperature and the m ad of the substance intrinsic ith a medium emission.	s in the MEASE tool. For op hat substance. Whereas in I nelting point of the substance	erations conducted with soli hot metal operations, fugacit e. As a third group, high abra	d substances at ambient y is temperature based, asive tasks are based on			
PROC	Use in preparation	Content in preparation	Physical form	Emission potential			
PROC 7	not res	stricted	aqueous solution	medium			
All other applicable PROCs	not res	stricted	aqueous solution	very low			
Amounts used							
the scale of operation (ind	ed per shift is not considered lustrial vs. professional) and s intrinsic emission potential.	level of containment/automa					
Frequency and duration	of use/exposure						
PROC		Duration o	f exposure				
PROC 7		≤ 240 r	ninutes				
All other applicable PROCs		480 minutes (not restricted)					
Other given operational	e during all process steps ref conditions affecting worke are not used in hot-metallu	ers exposure		•			
	red relevant for occupational			· · ·			
	d measures at process lev res at the process level (e.g			e generally not required			
the processes.	d waaruwaa ta aantiral diar		de the werker				
	d measures to control disp		Efficiency of LC				
PROC	Level of separation	Localised controls (LC)	(according to MEASE)	Further information			
PROC 7	Any potentially required separation of workers from the emission source is indicated above under "Frequency and duration	local exhaust ventilation	78 %	-			
PROC 19	of exposure". A reduction of exposure duration can be achieved, for example, by the	not applicable	na	-			
	installation of ventilated			-			
All other applicable PROCs	(positive pressure) control rooms or by removing the worker from workplaces involved with relevant exposure.	not required	na	-			

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create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010						
Conditions and measure	Conditions and measures related to personal protection, hygiene and health evaluation									
PROC	Specification of respiratory protective equipment (RPE)	RPE efficiency (assigned protection factor, APF)	Specification of gloves	Further personal protective equipment (PPE)						
PROC 7	FFP1 mask	APF=4	Since calcium magnesium carbonate oxide is considered as	Eye protection equipment (e.g. goggles or visors) must be worn, unless potential contact with the eye can be excluded by the nature						
All other applicable PROCs	not required na steps. and type of a are required as appropriate as a propriate a									
Any RPE as defined above shall only be worn if the following principles are implemented in parallel: The duration of work (compare with "duration of exposure" above) should reflect the additional physiological stress for the worker due to the breathing resistance and mass of the RPE itself, due to the increased thermal stress by enclosing the head. In addition, it shall be considered that the worker's capability of using tools and of communicating are reduced during the wearing of RPE. For reasons as given above, the worker should therefore be (i) healthy (especially in view of medical problems that may affect the use of RPE), (ii) have suitable facial characteristics reducing leakages between face and mask (in view of scars and facial hair). The recommended devices above which rely on a tight face seal will not provide the required protection unless they fit the contours of the face properly and securely. The employer and self-employed persons have legal responsibilities for the maintenance and issue of respiratory protective devices and the management of their correct use in the workplace. Therefore, they should define and document a suitable policy for a respiratory protective device programme including training of the workers. An overview of the APFs of different RPE (according to BS EN 529:2005) can be found in the glossary of MEASE.										
2.2 Control of enviro										
Amounts used										
The daily and annual amo	unt per site (for point source	s) is not considered to be th	ne main determinant for envi	ronmental exposure.						
Frequency and duration	of use									
Intermittent (< 12 time per	year) or continuous use/rele	ease								
Environment factors not	influenced by risk manage	ement								
Flow rate of receiving surfa	ace water: 18000 m³/day									
Other given operational	conditions affecting enviro	onmental exposure								
Effluent discharge rate: 20	00 m³/day									
Technical onsite condition	ons and measures to redu	ce or limit discharges, air	emissions and releases to	o soil						
water, in case such discha open waters is required. In (e.g. through neutralisation	rges are expected to cause general discharges should n). In general most aquatic o	significant pH changes. Re be carried out such that pH rganisms can tolerate pH v	lime solutions into municipal gular control of the pH value changes in receiving surfac alues in the range of 6-9. Th his risk management measur	e during introduction into e waters are minimised is is also reflected in the						
Conditions and measure	s related to waste									
Solid industrial waste of lin	ne should be reused or discl	harged to the industrial was	tewater and further neutraliz	ed if needed.						

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3. Exposure estimat	3. Exposure estimation and reference to its source								
Occupational exposure									
The exposure estimation tool MEASE was used for the assessment of inhalation exposure. The risk characterisation ratio (RCR) is the quotient of the refined exposure estimate and the respective DNEL (derived no-effect level) and has to be below 1 to demonstrate a safe use. For inhalation exposure, the RCR is based on the DNEL for calcium magnesium carbonate oxide of 1 mg/m ³ (as respirable dust) and the respective inhalation exposure estimate derived using MEASE (as inhalable dust). Thus, the RCR includes an additional safety margin since the respirable fraction being a sub-fraction of the inhalable fraction according to EN 481.									
PROC	Method used for inhalation exposure assessmentInhalation exposure estimate (RCR)Method used for dermal exposure assessmentDermal expo estimate (R								
PROC 1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19	MEASE	< 1 mg/m³ (0.001 – 0.66)	Since calcium magnes considered as irritating to to be minimised as far a DNEL for dermal effects ha dermal exposure is not a scen	skin, dermal exposure has is technically feasible. A as not been derived. Thus, ssessed in this exposure					
Environmental exposure									
discharges, being the toxic is being addressed, includi applicable, both for produc high water solubility and ve water. Significant emission or exposure to the terrestri environment will therefore	The production of calcium magnesium carbonate oxide can potentially result in an aquatic emission and locally increase the calcium magnesium carbonate oxide concentration and affect the pH in the aquatic								
Exposure concentration in waste water treatment plant (WWTP) Exposure concentration in aquatic pelagic compartment	very frequently and can be Waste water from calcium therefore there is no biolog carbonate oxide production (WWTPs), but can be used When calcium magnesium sediment will be negligible buffer capacity of the wate general the buffer capacity equilibrium between carbo	oxide production sites may impact the pH in the receiving water. The pH of effluents is normally measured very frequently and can be neutralised easily as often required by national laws. Waste water from calcium magnesium carbonate oxide production is an inorganic wastewater stream and therefore there is no biological treatment. Therefore, wastewater streams from calcium magnesium carbonate oxide production sites will normally not be treated in biological waste water treatment plants (WWTPs), but can be used for pH control of acid wastewater streams that are treated in biological WWTPs. When calcium magnesium carbonate oxide is emitted to surface water, sorption to particulate matter and sediment will be negligible. When lime is rejected to surface water, the pH may increase, depending on the buffer capacity of the water. The higher the buffer capacity of the water is regulated by the equilibrium between carbon dioxide (CO2), the bicarbonate ion (HCO3-) and the carbonate ion (CO32-).							
Exposure concentration in sediments		magnesium carbonate oxide	because it is not considered is emitted to the aquatic con						
Exposure concentrations in soil and groundwater	relevant.		osure scenario, because it is						
Exposure concentration in atmospheric compartment	when emitted to air as an a its reaction with CO2 (or of calcium(bi)carbonate) are	aerosol in water, calcium ma ther acids), into HCO3- and	use it is considered not relev- agnesium carbonate oxide is Ca2+. Subsequently, the sa I thus the atmospheric emiss soil and water.	neutralised as a result of lts (e.g.					
Exposure concentration relevant for the food chain (secondary poisoning)	Bioaccumulation in organis is therefore not required.	sms is not relevant for lime s	substance: a risk assessmer	t for secondary poisoning					

Trade name:	2040	Half-calcined Dolomite	nrint data: 00.12.2010						
create date: 01.12.	2010	revision date: 09.12.2010	print date: 09.12.2010						
4. Guidance to	DU to evaluate whether	he works inside the boundarie	s set by the ES						
Occupational expo	sure								
downstream user ca adequate. This has (given that the proca available, the DU m exposure. The dusti dustiness less than than 10 % (RDM) and	an demonstrate on his own that h to be done by showing that they esses and activities in question a ay make use of an appropriate s ness of the substance used can 2.5 % according to the Rotating re defined as "medium dusty" an	his operational conditions and implemented limit the inhalation and dermal exposure are covered by the PROCs listed above) a scaling tool such as MEASE (<u>www.ebrc.de</u> be determined according to the MEASE (Drum Method (RDM) are defined as "low d substances with a dustiness ≥10 % are	to a level below the respective DNEL as given below. If measured data are not <u>e/mease.html</u>) to estimate the associated glossary. For example, substances with a dusty", substances with a dustiness less						
DNEL _{inhalation} :	1 mg/m ³ (as respirable du	ıst)							
a level of 4 mg/m ³ . I therefore also cover by a factor of 2). Wh	By demonstrating a safe use whe red (according to R.14 guidance, nen using MEASE for the derivat	en comparing exposure estimates with the	multiplying long-term exposure estimates the exposure duration should only be						
Environmental exp	osure								
	If a site does not comply with the conditions stipulated in the safe use ES, it is recommended to apply a tiered approach to perform a more site-specific assessment. For that assessment, the following stepwise approach is recommended.								
		contribution of the calcium magnesium ca e to lime, then further actions are required	arbonate oxide on the resulting pH. Should t to demonstrate safe use.						
		after the discharge point. The pH of the reverted to the rever can be calculated as follows:	eceiving water shall not exceed the value of						
nHriver = Los	$\int Qeffluent * 10^{pHeffluent} +$	$\begin{array}{c} Qriverupstream * 10^{pHupstream} \\ ream + Qeffluent \end{array}$							
	Qriverupstr	ream + Qeffluent							
		(1	<i>Eq</i> 1)						
Where:									
Q effluent	t refers to the effluent flow (in m ³)	/day)							
Q river up	stream refers to the upstream riv	ver flow (in m³/day)							
pH effluer	nt refers to the pH of the effluent								
pH upstre	am river refers to the pH of the r	river upstream of the discharge point							
Please no	ote that initially, default values ca	in be used:							
•	Q river upstream flows: use the	10th of existing measurements distributio	n or use default value of 18000 m³/day						
•	Q effluent: use default value of 2	2000 m³/day							
	The upstream pH is preferably a justified.	a measured value. If not available, one c	can assume a neutral pH of 7 if this can be						
Such equation has	o be seen as a worst case scena	ario, where water conditions are standard	and not case specific.						
of the river is set at As temperature inf admissible pH value that there is no buff is available). Maxim	value 9 and pH of the effluent i luences lime solubility, pH efflu e in the effluent is established, i er capacity conditions to conside um load of lime that can be ann equilibrium. OH- expressed as	is calculated accordingly (using default va uent might require to be adjusted on a it is assumed that the OH- concentration er (this is a unrealistic worst case scenario nually rejected without negatively affecting	in the receiving body. In order to do so, pH alues as reported previously, if necessary). case-by-case basis. Once the maximum is are all dependent on lime discharge and o, which can be modified where information g the pH of the receiving water is calculated ow of the effluent and then divided by the						
Tier 3: measure the	pH in the receiving water after	the discharge point. If pH is below 9 sat	fe use is reasonably demonstrated and the						

Tier 3: measure the pH in the receiving water after the discharge point. If pH is below 9, safe use is reasonably demonstrated and the ES ends here. If pH is found to be above 9, risk management measures have to be implemented: the effluent has to undergo neutralisation, thus ensuring safe use of lime during production or use phase.



Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.2: Manufacture and industrial uses of low dusty solids/powders of lime substances

Exposure Scenario	Format (1) addressing uses carried out by	y workers	
1. Title			
Free short title	Manufacture and industrial uses of low dusty solids/powders of lime substances		
Systematic title based on use descriptor	SU3, SU1, SU2a, SU2b, SU4, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU23, SU24 PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC36, PC37, PC38, PC39, PC40 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13 (appropriate PROCs and ERCs are given in Section 2 below)		
Processes, tasks and/or activities covered	Processes, tasks and/or activities cov	ered are described in Section 2 below.	
Assessment Method	The assessment of inhalation exposure is ba	sed on the exposure estimation tool MEASE.	
2. Operational cond	litions and risk management measures		
PROC/ERC	REACH definition	Involved tasks	
PROC 1	Use in closed process, no likelihood of exposure	Further information is provided in the ECHA Guidance on information requirements and chemical	
PROC 2	Use in closed, continuous process with occasional controlled exposure	safety assessment, Chapter R.12: Use descriptor system (ECHA-2010-G-05-EN).	
PROC 3	Use in closed batch process (synthesis or formulation)	System (ECHA-2010-0-05-EN).	
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises		
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)		
PROC 6	Calendering operations		
PROC 7	Industrial spraying		
PROC 8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities		
PROC 8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities		
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)		
PROC 10	Roller application or brushing		
PROC 13	Treatment of articles by dipping and pouring		
PROC 14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation		
PROC 15	Use as laboratory reagent		
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected		
PROC 17	Lubrication at high energy conditions and in partly open process		
PROC 18	Greasing at high energy conditions		
PROC 19	Hand-mixing with intimate contact and only PPE available		
PROC 21	Low energy manipulation of substances bound in materials and/or articles		
PROC 22	Potentially closed processing operations with minerals/metals at elevated temperature Industrial setting		
PROC 23	Open processing and transfer operations with minerals/metals at elevated temperature		

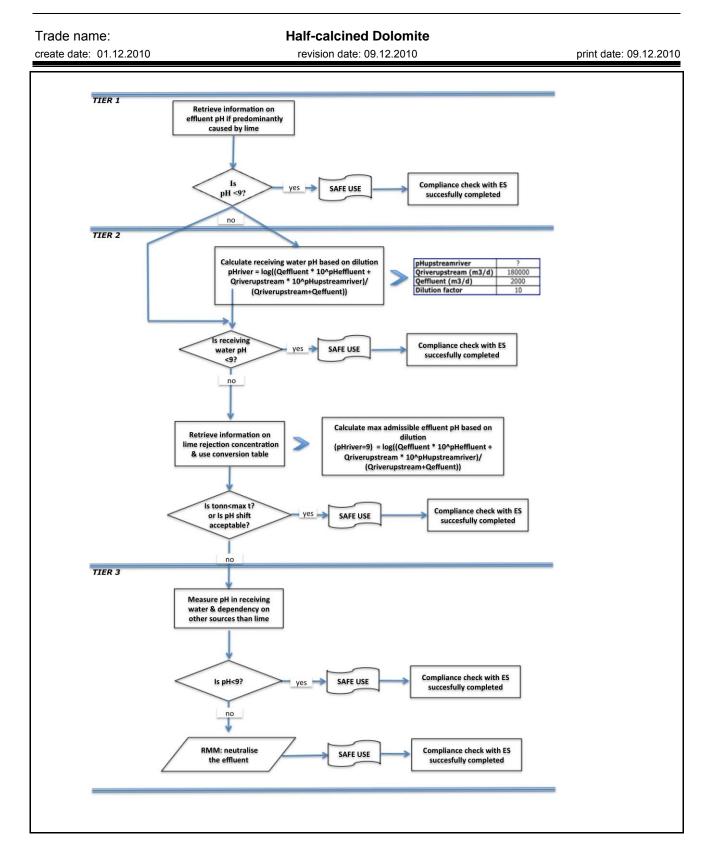
Trade name:	ŀ	lalf-calcined Dolomit	e		
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
PROC 24	High (mechanical) energ bound in materia				
PROC 25	Other hot work ope				
PROC 26	Handling of solid inorgan tempe				
PROC 27a	Production of metal po				
PROC 27b	Production of metal po	wders (wet processes)			
ERC 1-7, 12	Manufacture, formulation us	and all types of industrial es			
ERC 10, 11	Wide-dispersive outdoor a articles and				
2.1 Control of worke	ers exposure				
Product characteristic					
reflected by an assignmen temperature the fugacity is taking into account the pro	approach, the substance-intri t of a so-called fugacity class based on the dustiness of t cess temperature and the m ad of the substance intrinsic	s in the MEASE tool. For op hat substance. Whereas in l lelting point of the substance emission potential.	erations conducted with soli hot metal operations, fugaci	d substances at ambient y is temperature based,	
PROC	Use in preparation	Content in preparation	Physical form	Emission potential	
PROC 22, 23, 25, 27a	not res	stricted	solid/powder, molten	high	
PROC 24	not res	stricted	solid/powder	high	
All other applicable PROCs	not res	stricted	solid/powder	low	
Amounts used					
Frequency and duration PROC	of use/exposure	Duration o	f exposure		
PROC 22		≤ 240 minutes			
All other applicable PROCs	480 minutes (not restricted)				
	enced by risk management				
The shift breathing volume	during all process steps ref	lected in the PROCs is assu	imed to be 10 m³/shift (8 ho	urs).	
Other given operational of	conditions affecting worke	ers exposure			
assessment of the conduct assessment in MEASE is the expected to vary within the process temperatures are Technical conditions and Risk management measure	process temperature and p ted processes. In process st nowever based on the ratio of industry the highest ratio w automatically covered in this d measures at process level res at the process level (e.g.	eps with considerably high to of process temperature and as taken as a worst case as a exposure scenario for PRC el (source) to prevent relea	emperatures (i.e. PROC 22 melting point. As the associ- sumption for the exposure e OC 22, 23 and PROC 25.	, 23, 25), the exposure ated temperatures are estimation. Thus all	
the processes.					
	d measures to control disp		ds the worker Efficiency of LC	Further information	
PROC	Level of separation Any potentially required	Localised controls (LC)	(according to MEASE)	Further information	
PROC 7, 17, 18	separation of workers from the emission source	general ventilation	17 %	-	
PROC 19	is indicated above under "Frequency and duration	not applicable	na	-	
PROC 22, 23, 24, 25, 26, 27a	of exposure". A reduction of exposure duration can	local exhaust ventilation	78 %	-	
All other applicable PROCs	be achieved, for example, by the installation of ventilated	not required	na	_	

Trade name:	ŀ	lalf-calcined Dolomit	e		
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
	removing the worker from workplaces involved with relevant exposure.				
Organisational measures	s to prevent /limit releases	, dispersion and exposure	•	•	
measures involve good p smoking at the workplace	on. General occupational hy personal and housekeeping e, the wearing of standard t. Do not wear contaminated	practices (i.e. regular clear working clothes and shoes	aning with suitable cleaning unless otherwise stated be	g devices), no eating and elow. Shower and change	
Conditions and measure	s related to personal prote		evaluation		
PROC	Specification of respiratory protective equipment (RPE)	RPE efficiency (assigned protection factor, APF)	Specification of gloves	Further personal protective equipment (PPE)	
PROC 22, 24, 27a	FFP1 mask	APF=4	Since calcium	Eye protection equipment (e.g. goggles or visors) must be worn, unless	
All other applicable PROCs	not required	na	magnesium carbonate oxide is considered as irritating to skin, the use of protective gloves is mandatory for all process steps.	potential contact with the eye can be excluded by the nature and type of application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required to be worn as appropriate.	
of the RPE itself, due to the capability of using tools an For reasons as given abov RPE), (ii) have suitable fac recommended devices abor face properly and securely The employer and self-em the management of their c protective device program	ployed persons have legal re orrect use in the workplace. me including training of the v	by enclosing the head. In ad- uced during the wearing of F ire be (i) healthy (especially eakages between face and e seal will not provide the re esponsibilities for the mainter Therefore, they should defini- vorkers.	dition, it shall be considered RPE. in view of medical problems mask (in view of scars and quired protection unless the enance and issue of respirat he and document a suitable	that the worker's s that may affect the use of facial hair). The y fit the contours of the ory protective devices and policy for a respiratory	
An overview of the APFs of different RPE (according to BS EN 529:2005) can be found in the glossary of MEASE. 2.2 Control of environmental exposure					
Amounts used					
The daily and annual amount per site (for point sources) is not considered to be the main determinant for environmental exposure.					
Frequency and duration	of use				
Intermittent (< 12 time per	year) or continuous use/rele	ase			
Environment factors not	influenced by risk manage	ement			
Flow rate of receiving surfa	ace water: 18000 m³/day				
Other given operational	conditions affecting enviro	onmental exposure			
Effluent discharge rate: 20	00 m³/day				
	ons and measures to redu				
water, in case such discha open waters is required. In (e.g. through neutralisation	es related to the environmer rges are expected to cause general discharges should n). In general most aquatic o ECD tests with aquatic organ	significant pH changes. Reg be carried out such that pH rganisms can tolerate pH va	gular control of the pH value changes in receiving surfac alues in the range of 6-9. Th	e during introduction into e waters are minimised is is also reflected in the	
Conditions and measure	s related to waste				
Solid industrial waste of lin	ne should be reused or disch	narged to the industrial wast	ewater and further neutraliz	ed if needed.	

Trade name:	H	lalf-calcined Dolomit	e	
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010
3. Exposure estimat	tion and reference to	its source		
Occupational exposure				
quotient of the refined expuse. For inhalation exposu and the respective inhalati	osure estimate and the resp re, the RCR is based on the	ective DNEL (derived no-eff DNEL for calcium magnesi d using MEASE (as inhalab	exposure. The risk characteri fect level) and has to be belo um carbonate oxide of 1 mg ole dust). Thus, the RCR incl ccording to EN 481.	ow 1 to demonstrate a safe /m³ (as respirable dust)
PROC	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)
PROC 1, 2, 3, 4, 5, 6, 7, 8a, 8b, 9, 10, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27a, 27b	15, MEASE $<1 \text{ mg/m}^3 (0.01 - 0.83)$ to be minimised as far as technically feasible. A DNEL for dermal effects has not been derived. Thus			skin, dermal exposure has is technically feasible. A as not been derived. Thus, ssessed in this exposure
Environmental emission	S			
The aquatic effect and risk discharges, being the toxic is being addressed, includ applicable, both for produc high water solubility and ve water. Significant emission Significant emissions or ex- assessment for the aquatic	assessment only deal with sity of Ca2+ and Mg2+ is exp ing municipal sewage treatm tion and industrial use as ar ery low vapour pressure indi as or exposure to air are not posure to the terrestrial env c environment will therefore the local scale. The exposure ase above 9. The production of calcium locally increase the calcium	the effect on organisms/eco bected to be negligible comp nent plants (STPs) or industry offects that might occur w cate that calcium magnesiuu expected due to the low var ironment are not expected of only deal with the possible p assessment is approached magnesium carbonate oxide n and magnesium concentra	(production and use) mainly systems due to possible pH pared to the (potential) pH ef rial waste water treatment pl yould be expected to take pla m carbonate oxide will be foi pour pressure of calcium ma either for this exposure scena oH changes in STP effluent a l by assessing the resulting p e can potentially result in an ations and affect the pH in th ent from calcium magnesium	changes related to OH- ffect. Only the local scale ants (WWTPs) when ace on a local scale. The und predominantly in gnesium carbonate oxide. ario. The exposure and surface water related oh impact: the surface aquatic emission and the aquatic environment.
Exposure concentration in waste water treatment plant (WWTP)	When the pH is not neutralised, the discharge of effluent from calcium magnesium carbonate oxide production sites may impact the pH in the receiving water. The pH of effluents is normally measured very frequently and can be neutralised easily as often required by national laws. Waste water from calcium magnesium carbonate oxide production is an inorganic wastewater stream and therefore there is no biological treatment. Therefore, wastewater streams from calcium magnesium carbonate oxide production sites will normally not be treated in biological waste water treatment plants (WWTPs), but can be used for pH control of acid wastewater streams that are treated in biological WWTPs.			
Exposure concentration in aquatic pelagic compartment	When calcium magnesium sediment will be negligible. buffer capacity of the water general the buffer capacity equilibrium between carbo	carbonate oxide is emitted When lime is rejected to sure. The higher the buffer capa preventing shifts in acidity on dioxide (CO2), the bicarbo	to surface water, sorption to urface water, the pH may inc acity of the water, the lower to or alkalinity in natural waters onate ion (HCO3-) and the ca	particulate matter and rease, depending on the the effect on pH will be. In is regulated by the arbonate ion (CO32-).
Exposure concentration in sediments Exposure	magnesium carbonate oxic compartment, sorption to s	le: when calcium magnesiun ediment particles is negligib		to the aquatic
concentrations in soil and groundwater	The terrestrial compartmer relevant.	it is not included in this expo	osure scenario, because it is	not considered to be
Exposure concentration in atmospheric compartment	magnesium carbonate oxic oxide is neutralised as a re Subsequently, the salts (e.	le: when emitted to air as ar sult of its reaction with CO2 g. calcium(bi)carbonate) are	use it is considered not relevan a aerosol in water, calcium n ? (or other acids), into HCO3 e washed out from the air an te oxide largely end up in soi	nagnesium carbonate - and Ca2+. d thus the atmospheric
Exposure concentration relevant for the food chain (secondary poisoning)	Bioaccumulation in organis secondary poisoning is the		ım magnesium carbonate ox	ide: a risk assessment for

Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010
		P
4. Guidance to DU to evaluate	e whether he works inside the boundaries set I	by the ES
Occupational exposure		
downstream user can demonstrate on h adequate. This has to be done by show (given that the processes and activities available, the DU may make use of an a exposure. The dustiness of the substan dustiness less than 2.5 % according to t	et by the ES if either the proposed risk management measures his own that his operational conditions and implemented risk n ving that they limit the inhalation and dermal exposure to a level in question are covered by the PROCs listed above) as given appropriate scaling tool such as MEASE (www.ebrc.de/mease nee used can be determined according to the MEASE glossary the Rotating Drum Method (RDM) are defined as "low dusty", um dusty" and substances with a dustiness ≥10 % are defined	nanagement measures are el below the respective DNEL a below. If measured data are not <u>e.html</u>) to estimate the associated y. For example, substances with a substances with a dustiness less
DNEL _{inhalation} : 1 mg/m ³ (as res	spirable dust)	
a level of 4 mg/m ³ . By demonstrating a stherefore also covered (according to R. by a factor of 2). When using MEASE for	e of the fact that apart from the long-term DNEL given above, safe use when comparing exposure estimates with the long-te 14 guidance, acute exposure levels can be derived by multiply or the derivation of exposure estimates, it is noted that the exp nent measure (leading to an exposure reduction of 40 %).	erm DNEL, the acute DNEL is ying long-term exposure estimates
Environmental exposure		
	tions stipulated in the safe use ES, it is recommended to apply t assessment, the following stepwise approach is recommende	
	bH and the contribution of the calcium magnesium carbonate on ily attributable to lime, then further actions are required to dem	
	ng water pH after the discharge point. The pH of the receiving e pH in the river can be calculated as follows:	water shall not exceed the value of
pHriver = Log Qeffluent *10	$D^{pHeffluent} + Qriverupstream * 10^{pHupstream}$ priverupstream + Qeffluent	
	(<i>Eq</i> 1)	
Where:		
Q effluent refers to the effluer		
Q river upstream refers to the	e upstream river flow (in m³/day)	
pH effluent refers to the pH of		
pH upstream river refers to th	ne pH of the river upstream of the discharge point	
Please note that initially, defa	ault values can be used:	
Q river upstream flo	ows: use the 10th of existing measurements distribution or use	e default value of 18000 m³/day
Q effluent: use defa	ault value of 2000 m³/day	
 The upstream pH is justified. 	s preferably a measured value. If not available, one can assu	ume a neutral pH of 7 if this can be
Such equation has to be seen as a wors	st case scenario, where water conditions are standard and no	t case specific.
of the river is set at value 9 and pH of th As temperature influences lime solubility admissible pH value in the effluent is es that there is no buffer capacity condition is available). Maximum load of lime that	ntify which effluent pH causes an acceptable pH level in the re the effluent is calculated accordingly (using default values as re ty, pH effluent might require to be adjusted on a case-by-case stablished, it is assumed that the OH- concentrations are all de ns to consider (this is a unrealistic worst case scenario, which t can be annually rejected without negatively affecting the pH of pressed as moles/litre are multiplied by average flow of the eff carbonate oxide.	eported previously, if necessary). basis. Once the maximum ependent on lime discharge and can be modified where information of the receiving water is calculated
° °	water after the discharge point. If pH is below 9, safe use is re	easonably demonstrated and the

ES ends here. If pH is found to be above 9, risk management measures have to be implemented: the effluent has to undergo neutralisation, thus ensuring safe use of lime during production or use phase.



Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.3: Manufacture and industrial uses of medium dusty solids/powders of lime substances

Exposure Scenario	Format (1) addressing uses carried out by	y workers	
1. Title			
Free short title	Manufacture and industrial uses of mediur	n dusty solids/powders of lime substances	
Systematic title based on use descriptor	SU3, SU1, SU2a, SU2b, SU4, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU23, SU24 PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC36, PC37, PC38, PC39, PC40 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13 (appropriate PROCs and ERCs are given in Section 2 below)		
Processes, tasks and/or activities covered	Processes, tasks and/or activities cove	ered are described in Section 2 below.	
Assessment Method	The assessment of inhalation exposure is ba	sed on the exposure estimation tool MEASE.	
2. Operational cond	litions and risk management measures		
PROC/ERC	REACH definition	Involved tasks	
PROC 1	Use in closed process, no likelihood of exposure	Further information is provided in the ECHA Guidance on information requirements and chemical	
PROC 2	Use in closed, continuous process with occasional controlled exposure	safety assessment, Chapter R.12: Use descriptor system (ECHA-2010-G-05-EN).	
PROC 3	Use in closed batch process (synthesis or formulation)		
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises		
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)		
PROC 7	Industrial spraying		
PROC 8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities		
PROC 8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities		
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)))	
PROC 10	Roller application or brushing		
PROC 13	Treatment of articles by dipping and pouring		
PROC 14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation		
PROC 15	Use as laboratory reagent		
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected		
PROC 17	Lubrication at high energy conditions and in partly open process		
PROC 18	Greasing at high energy conditions		
PROC 19	Hand-mixing with intimate contact and only PPE available		
PROC 22	Potentially closed processing operations with minerals/metals at elevated temperature Industrial setting		
PROC 23	Open processing and transfer operations with minerals/metals at elevated temperature		
PROC 24	High (mechanical) energy work-up of substances bound in materials and/or articles		
PROC 25	Other hot work operations with metals		

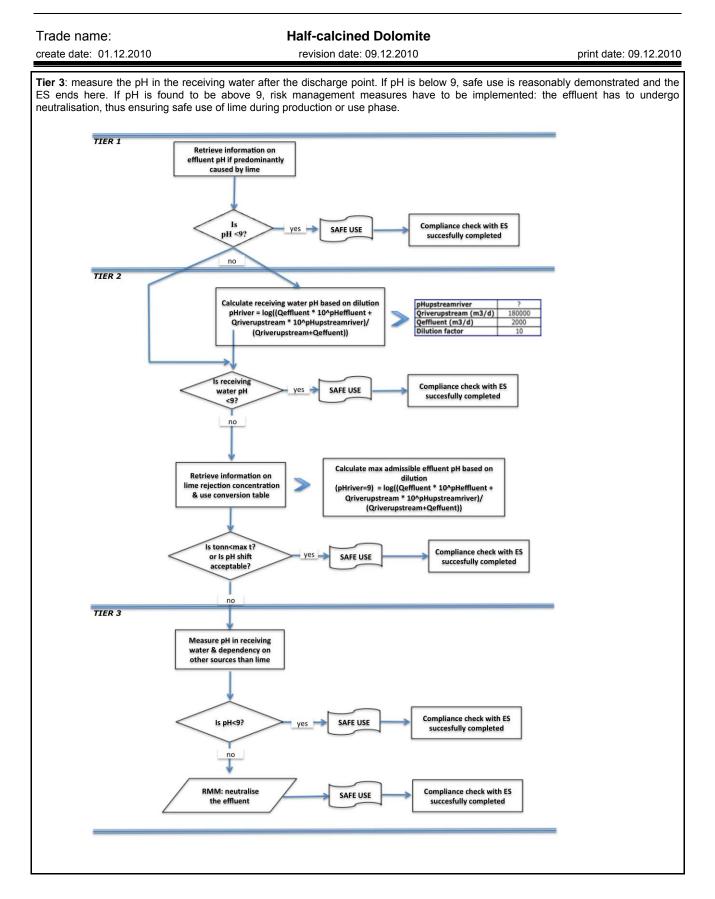
	•	Half-calcined Dolomit	e	a sist data : 00 40 0040	
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
PROC 26		ic substances at ambient erature			
PROC 27a	Production of metal pc	Production of metal powders (hot processes)			
PROC 27b	Production of metal po	wders (wet processes)			
ERC 1-7, 12		and all types of industrial es			
ERC 10, 11		and indoor use of long-life d materials			
2.1 Control of worke					
Product characteristic					
reflected by an assignmen temperature the fugacity is taking into account the pro	approach, the substance-intr t of a so-called fugacity clas s based on the dustiness of t pcess temperature and the m ad of the substance intrinsic	s in the MEASE tool. For op hat substance. Whereas in l nelting point of the substance	erations conducted with soli hot metal operations, fugaci	d substances at ambient ty is temperature based,	
PROC	Use in preparation	Content in preparation	Physical form	Emission potential	
PROC 22, 23, 25, 27a	not res	stricted	solid/powder, molten	high	
PROC 24	not res	stricted	solid/powder	high	
All other applicable PROCs	not res	stricted	solid/powder	medium	
Amounts used					
the scale of operation (i	ed per shift is not considere ndustrial vs. professional) s intrinsic emission potential.	and level of containment/a			
Frequency and duration	of use/exposure				
PROC	Duration of exposure				
PROC 7, 17, 18, 19, 22	≤ 240 minutes				
All other applicable PROCs	480 minutes (not restricted)				
Human factors not influe	enced by risk management	t in the second s			
The shift breathing volume	during all process stops rof	lasted in the DDOCs is easy	umed to be 10 m ³ /shift (8 ho		
	e during all process steps rel	lected in the PROCS is assu		urs).	
5	conditions affecting worke			urs).	
Other given operational Operational conditions like assessment of the conduc assessment in MEASE is l expected to vary within the		ers exposure rocess pressure are not con teps with considerably high to of process temperature and as taken as a worst case as	temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e	tional exposure , 23, 25), the exposure ated temperatures are	
Other given operational of Operational conditions like assessment of the conduct assessment in MEASE is leave expected to vary within the process temperatures are Technical conditions and	conditions affecting worke e process temperature and p ted processes. In process st however based on the ratio of e industry the highest ratio w automatically covered in this d measures at process leve	ers exposure rocess pressure are not con teps with considerably high to of process temperature and as taken as a worst case as as exposure scenario for PRC el (source) to prevent relevant	temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e DC 22, 23 and PROC 25.	tional exposure , 23, 25), the exposure ated temperatures are estimation. Thus all	
Other given operational of Operational conditions like assessment of the conduct assessment in MEASE is leave expected to vary within the process temperatures are Technical conditions and	conditions affecting worke e process temperature and p ted processes. In process st however based on the ratio of e industry the highest ratio w automatically covered in this	ers exposure rocess pressure are not con teps with considerably high to of process temperature and as taken as a worst case as as exposure scenario for PRC el (source) to prevent relevant	temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e DC 22, 23 and PROC 25.	tional exposure , 23, 25), the exposure ated temperatures are estimation. Thus all	
Other given operational Operational conditions like assessment of the conduc assessment in MEASE is l expected to vary within the process temperatures are Technical conditions and Risk management measure the processes.	conditions affecting worke e process temperature and p ted processes. In process st however based on the ratio of e industry the highest ratio w automatically covered in this d measures at process leve	ers exposure rocess pressure are not con leps with considerably high to of process temperature and as taken as a worst case as a exposure scenario for PRC el (source) to prevent relea containment or segregation	temperatures (i.e. PROC 22 melting point. As the associ sumption for the exposure e DC 22, 23 and PROC 25. ase of the emission source) are	tional exposure , 23, 25), the exposure ated temperatures are estimation. Thus all	
Other given operational Operational conditions like assessment of the conduc assessment in MEASE is l expected to vary within the process temperatures are Technical conditions and Risk management measure the processes.	conditions affecting worke e process temperature and p ted processes. In process st however based on the ratio of e industry the highest ratio w automatically covered in this d measures at process level res at the process level (e.g.	ers exposure rocess pressure are not con leps with considerably high to of process temperature and as taken as a worst case as a exposure scenario for PRC el (source) to prevent relea containment or segregation	temperatures (i.e. PROC 22 melting point. As the associ sumption for the exposure e DC 22, 23 and PROC 25. ase of the emission source) are	tional exposure , 23, 25), the exposure ated temperatures are estimation. Thus all	
Other given operational Operational conditions like assessment of the conduc assessment in MEASE is l expected to vary within the process temperatures are Technical conditions and Risk management measure the processes. Technical conditions and	conditions affecting worke e process temperature and p ted processes. In process st however based on the ratio of e industry the highest ratio w automatically covered in this d measures at process level res at the process level (e.g. d measures to control disp Level of separation Any potentially required	ers exposure rocess pressure are not con teps with considerably high to of process temperature and as taken as a worst case as a exposure scenario for PRC el (source) to prevent relea containment or segregation persion from source towar	temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e DC 22, 23 and PROC 25. ase of the emission source) are ds the worker Efficiency of LC	tional exposure , 23, 25), the exposure ated temperatures are estimation. Thus all e generally not required in	
Other given operational Operational conditions like assessment of the conduc assessment in MEASE is le expected to vary within the process temperatures are Technical conditions and Risk management measure the processes. Technical conditions and PROC	conditions affecting worke e process temperature and p ted processes. In process st however based on the ratio of e industry the highest ratio w automatically covered in this d measures at process level res at the process level (e.g. d measures to control disp Level of separation Any potentially required separation of workers from the emission source	rocess pressure are not conteps with considerably high to for process temperature and as taken as a worst case as exposure scenario for PRC el (source) to prevent releated containment or segregation persion from source towar Localised controls (LC)	temperatures (i.e. PROC 22 melting point. As the associ sumption for the exposure e OC 22, 23 and PROC 25. ase of the emission source) are ds the worker Efficiency of LC (according to MEASE)	tional exposure , 23, 25), the exposure ated temperatures are estimation. Thus all e generally not required in	
Other given operational Operational conditions like assessment of the conduc assessment in MEASE is lexpected to vary within the process temperatures are Technical conditions and Risk management measure the processes. Technical conditions and PROC PROC 1, 2, 15, 27b	conditions affecting worke e process temperature and p ted processes. In process st however based on the ratio of e industry the highest ratio w automatically covered in this d measures at process level res at the process level (e.g. d measures to control disp Level of separation Any potentially required separation of workers	ers exposure rocess pressure are not con teps with considerably high to of process temperature and as taken as a worst case as a exposure scenario for PRC el (source) to prevent relea containment or segregation persion from source towar Localised controls (LC) not required	temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e DC 22, 23 and PROC 25. ase of the emission source) are ds the worker Efficiency of LC (according to MEASE) na	tional exposure , 23, 25), the exposure ated temperatures are estimation. Thus all e generally not required in	

Trade name:	ŀ	alf-calcined Dolomit	e			
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010		
Organisational measures	Organisational measures to prevent /limit releases, dispersion and exposure					
measures involve good p smoking at the workplace	on. General occupational hy ersonal and housekeeping , the wearing of standard v . Do not wear contaminated	practices (i.e. regular clea working clothes and shoes	aning with suitable cleaning unless otherwise stated be	g devices), no eating and elow. Shower and change		
Conditions and measures	s related to personal prote	ection, hygiene and health	evaluation			
PROC	Specification of respiratory protective equipment (RPE)	RPE efficiency (assigned protection factor, APF)	Specification of gloves	Further personal protective equipment (PPE)		
PROC 4, 5, 7, 8a, 8b, 9, 10, 16, 17, 18, 19, 22, 24, 27a	FFP1 mask	APF=4		Eye protection equipment (e.g. goggles or visors) must be worn, unless		
All other applicable PROCs	not required	na	Since calcium magnesium carbonate oxide is considered as irritating to skin, the use of protective gloves is mandatory for all process steps.	potential contact with the eye can be excluded by the nature and type of application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required to be worn as appropriate.		
"duration of exposure" abo of the RPE itself, due to the capability of using tools and For reasons as given abov RPE), (ii) have suitable fac recommended devices abo face properly and securely The employer and self-emp the management of their co protective device program	Any RPE as defined above shall only be worn if the following principles are implemented in parallel: The duration of work (compare with "duration of exposure" above) should reflect the additional physiological stress for the worker due to the breathing resistance and mass of the RPE itself, due to the increased thermal stress by enclosing the head. In addition, it shall be considered that the worker's capability of using tools and of communicating are reduced during the wearing of RPE. For reasons as given above, the worker should therefore be (i) healthy (especially in view of medical problems that may affect the use of RPE), (ii) have suitable facial characteristics reducing leakages between face and mask (in view of scars and facial hair). The recommended devices above which rely on a tight face seal will not provide the required protection unless they fit the contours of the face properly and securely. The employer and self-employed persons have legal responsibilities for the maintenance and issue of respiratory protective devices and the management of their correct use in the workplace. Therefore, they should define and document a suitable policy for a respiratory protective device programme including training of the workers. An overview of the APFs of different RPE (according to BS EN 529:2005) can be found in the glossary of MEASE.					
2.2 Control of environmental exposure						
Amounts used						
The daily and annual amount per site (for point sources) is not considered to be the main determinant for environmental exposure.						
Frequency and duration	Frequency and duration of use					
Intermittent (< 12 time per	year) or continuous use/rele	ease				
Environment factors not	influenced by risk manage	ement				
Flow rate of receiving surfa	ace water: 18000 m³/day					
Other given operational of	conditions affecting enviro	onmental exposure				
Effluent discharge rate: 200	00 m³/day					
Technical onsite condition	ons and measures to redu	ce or limit discharges, air	emissions and releases to	o soil		
Risk management measures related to the environment aim to avoid discharging lime solutions into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH changes. Regular control of the pH value during introduction into open waters is required. In general discharges should be carried out such that pH changes in receiving surface waters are minimised (e.g. through neutralisation). In general most aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standard OECD tests with aquatic organisms. The justification for this risk management measure can be found in the introduction section.						
Conditions and measures	s related to waste					
Solid industrial waste of lim	Solid industrial waste of lime should be reused or discharged to the industrial wastewater and further neutralized if needed.			ed if needed.		

Trade name: create date: 01.12.2010	ŀ	Half-calcined Dolomit revision date: 09.12.2010	e	print date: 09.12.2010	
				print date: 03.12.2010	
	tion and reference to	its source			
Occupational exposure	ad MEASE was used for the	a accomment of inholation of	when the risk share star	ination ratio (DCD) in the	
quotient of the refined exp use. For inhalation exposu and the respective inhalati	bol MEASE was used for the osure estimate and the resp re, the RCR is based on the on exposure estimate derive e fraction being a sub-fractio	ective DNEL (derived no-eff DNEL for calcium magnesi d using MEASE (as inhalab	ect level) and has to be belo um carbonate oxide of 1 mg le dust). Thus, the RCR incl	ow 1 to demonstrate a safe //m³ (as respirable dust)	
PROC	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)	
PROC 1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 27a, 27b	MEASE	< 1 mg/m³ (0.01 – 0.88)	considered as irritating to to be minimised as far a DNEL for dermal effects ha	as technically feasible. A as not been derived. Thus, ssessed in this exposure	
Environmental emission	S				
emissions of calcium maging The aquatic effect and risk discharges, being the toxic is being addressed, includ applicable, both for product high water solubility and very water. Significant emissions Significant emissions or ex- assessment for the aquation		ne different life-cycle stages the effect on organisms/eco bected to be negligible comp nent plants (STPs) or indust ny effects that might occur w cate that calcium magnesiu expected due to the low var ironment are not expected e only deal with the possible p assessment is approached	(production and use) mainly systems due to possible pH bared to the (potential) pH et rial waste water treatment pl rould be expected to take pla m carbonate oxide will be fo oour pressure of calcium ma either for this exposure scen oH changes in STP effluent a by assessing the resulting	Apply to (waste) water. changes related to OH- ffect. Only the local scale lants (WWTPs) when ace on a local scale. The und predominantly in ignesium carbonate oxide. ario. The exposure and surface water related pH impact: the surface	
Environmental emissions	The production of calcium magnesium carbonate oxide can potentially result in an aquatic emission and locally increase the calcium and magnesium concentrations and affect the pH in the aquatic environment. When the pH is not neutralised, the discharge of effluent from calcium magnesium carbonate oxide production sites may impact the pH in the receiving water. The pH of effluents is normally measured very frequently and can be neutralised easily as often required by national laws.				
Exposure concentration in waste water treatment plant (WWTP)	Waste water from calcium magnesium carbonate oxide production is an inorganic wastewater stream and therefore there is no biological treatment. Therefore, wastewater streams from calcium magnesium carbonate oxide production sites will normally not be treated in biological waste water treatment plants (WWTPs), but can be used for pH control of acid wastewater streams that are treated in biological WWTPs.				
Exposure concentration in aquatic pelagic compartment	When calcium magnesium carbonate oxide is emitted to surface water, sorption to particulate matter and sediment will be negligible. When lime is rejected to surface water, the pH may increase, depending on the buffer capacity of the water. The higher the buffer capacity of the water, the lower the effect on pH will be. In general the buffer capacity preventing shifts in acidity or alkalinity in natural waters is regulated by the equilibrium between carbon dioxide (CO2), the bicarbonate ion (HCO3-) and the carbonate ion (CO32–). The sediment compartment is not included in this ES, because it is not considered relevant for calcium				
Exposure concentration in sediments	magnesium carbonate oxic		m carbonate oxide is emitted		
Exposure concentrations in soil and groundwater	relevant.	•	osure scenario, because it is		
Exposure concentration in atmospheric compartment	magnesium carbonate oxic oxide is neutralised as a re Subsequently, the salts (e.	de: when emitted to air as an sult of its reaction with CO2 g. calcium(bi)carbonate) are	use it is considered not relev n aerosol in water, calcium n ? (or other acids), into HCO3 e washed out from the air an e oxide largely end up in so	nagnesium carbonate - and Ca2+. Id thus the atmospheric	
Exposure concentration relevant for the food chain (secondary poisoning)	Bioaccumulation in organis secondary poisoning is the		im magnesium carbonate ox	vide: a risk assessment for	
4. Guidance to DU to	o evaluate whether h	e works inside the bo	oundaries set by the	ES	
Occupational exposure					
downstream user can dem	oundaries set by the ES if e ionstrate on his own that his lone by showing that they lin	operational conditions and	implemented risk managem I exposure to a level below t	ent measures are	

downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below. If measured data are not available, the DU may make use of an appropriate scaling tool such as MEASE (www.ebrc.de/mease.html) to estimate the associated exposure. The dustiness of the substance used can be determined according to the MEASE glossary. For example, substances with a dustiness less than 2.5 % according to the Rotating Drum Method (RDM) are defined as "low dusty", substances with a dustiness less

Trade name: create date: 01.12.2010	Half-calcined Dolomite revision date: 09.12.2010	print date: 09.12.201
		•
()	dium dusty" and substances with a dustiness ≥10 % are define	ed as "high dusty".
	espirable dust)	
a level of 4 mg/m ³ . By demonstrating therefore also covered (according to f by a factor of 2). When using MEASE	are of the fact that apart from the long-term DNEL given above a safe use when comparing exposure estimates with the long- R.14 guidance, acute exposure levels can be derived by multip for the derivation of exposure estimates, it is noted that the ex- ement measure (leading to an exposure reduction of 40 %).	-term DNEL, the acute DNEL is plying long-term exposure estimates
Environmental exposure		
	ditions stipulated in the safe use ES, it is recommended to app at assessment, the following stepwise approach is recommend	
	t pH and the contribution of the calcium magnesium carbonate ntly attributable to lime, then further actions are required to de	
	ring water pH after the discharge point. The pH of the receiving he pH in the river can be calculated as follows:	g water shall not exceed the value of
	o pHeffluent	
$pHriver = Log \frac{Qeffluent *}{Qeffluent *}$	$\frac{10^{pHeffluent} + Qriverupstream * 10^{pHupstream}}{Qriverupstream + Qeffluent}$	
	Qriverupstream + Qeffluent	
	<i>Eq 1</i>)	
Where:		
Q effluent refers to the efflu		
•	he upstream river flow (in m³/day)	
pH effluent refers to the pH		
1 1	the pH of the river upstream of the discharge point	
Please note that initially, de		
•	flows: use the 10th of existing measurements distribution or us	se default value of 18000 m/day
• The upstream pH	efault value of 2000 m³/day I is preferably a measured value. If not available, one can as	sume a neutral pH of 7 if this can b
justified. Such equation has to be seen as a w	orst case scenario, where water conditions are standard and n	not case specific.
		-
of the river is set at value 9 and pH of As temperature influences lime solubi admissible pH value in the effluent is that there is no buffer capacity conditi	entify which effluent pH causes an acceptable pH level in the n the effluent is calculated accordingly (using default values as lity, pH effluent might require to be adjusted on a case-by-cas established, it is assumed that the OH- concentrations are all tons to consider (this is a unrealistic worst case scenario, whic nat can be annually rejected without negatively affecting the pH	reported previously, if necessary). e basis. Once the maximum dependent on lime discharge and ch can be modified where information



Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.4: Manufacture and industrial uses of high dusty solids/powders of lime substances

Exposure Scenario	Format (1) addressing uses carried out by	y workers	
1. Title			
Free short title	Manufacture and industrial uses of high	dusty solids/powders of lime substances	
Systematic title based on use descriptor	SU3, SU1, SU2a, SU2b, SU4, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU23, SU24 PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC36, PC37, PC38, PC39, PC40 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13 (appropriate PROCs and ERCs are given in Section 2 below)		
Processes, tasks and/or activities covered	Processes, tasks and/or activities covered are described in Section 2 below.		
Assessment Method	The assessment of inhalation exposure is ba	sed on the exposure estimation tool MEASE.	
2. Operational conc	litions and risk management measures		
PROC/ERC	REACH definition	Involved tasks	
PROC 1	Use in closed process, no likelihood of exposure	Further information is provided in the ECHA Guidance on information requirements and chemical	
PROC 2	Use in closed, continuous process with occasional controlled exposure	safety assessment, Chapter R.12: Use descriptor system (ECHA-2010-G-05-EN).	
PROC 3	Use in closed batch process (synthesis or formulation)	System (LOHA-2010-0-00-LIV).	
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises		
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)		
PROC 7	Industrial spraying		
PROC 8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities		
PROC 8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities		
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)		
PROC 10	Roller application or brushing		
PROC 13	Treatment of articles by dipping and pouring		
PROC 14	Production of preparations or articles by tabletting, compression, extrusion, pelletisation		
PROC 15	Use as laboratory reagent		
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected		
PROC 17	Lubrication at high energy conditions and in partly open process		
PROC 18	Greasing at high energy conditions		
PROC 19	Hand-mixing with intimate contact and only PPE available		
PROC 22	Potentially closed processing operations with minerals/metals at elevated temperature Industrial setting		
PROC 23	Open processing and transfer operations with minerals/metals at elevated temperature		
PROC 24	High (mechanical) energy work-up of substances bound in materials and/or articles		
PROC 25	Other hot work operations with metals		
PROC 26	Handling of solid inorganic substances at ambient temperature		

Dolomitwerk Jettenberg Schöndorfer GmbH

Trade name:	ŀ	lalf-calcined Dolomit	e		
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
PROC 27a	Production of metal po	wders (hot processes)			
PROC 27b	Production of metal po	wders (wet processes)			
ERC 1-7, 12	Manufacture, formulation and all types of industrial uses				
ERC 10, 11		Wide-dispersive outdoor and indoor use of long-life articles and materials			
2.1 Control of worke	ers exposure				
Product characteristic					
reflected by an assignmen temperature the fugacity is taking into account the pro	t of a so-called fugacity clas based on the dustiness of t	s in the MEASE tool. For op hat substance. Whereas in lelting point of the substance	ne of the main exposure det perations conducted with soli hot metal operations, fugaci e. As a third group, high abra	d substances at ambient ty is temperature based,	
PROC	Use in preparation	Content in preparation	Physical form	Emission potential	
PROC 22, 23, 25, 27a	not res	stricted	solid/powder, molten	high	
All other applicable PROCs	not res	stricted	solid/powder	high	
Amounts used					
the scale of operation (inde		level of containment/automa	as such for this scenario. Ins ation (as reflected in the PR(
Frequency and duration	of use/exposure				
PROC		Duration of exposure			
PROC 7, 8a, 17, 18, 19, 22		≤ 240 minutes			
All other applicable PROCs	480 minutes (not restricted)				
Human factors not influe	nced by risk management				
The shift breathing volume	during all process steps ref	lected in the PROCs is assu	umed to be 10 m ³ /shift (8 ho	urs).	
Other given operational	conditions affecting worke	ers exposure			
assessment of the conduct assessment in MEASE is h expected to vary within the	ted processes. In process st nowever based on the ratio of	eps with considerably high to of process temperature and as taken as a worst case as	isidered relevant for occupat temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e DC 22, 23 and PROC 25.	, 23, 25), the exposure ated temperatures are	
	d measures at process leve	· · · ·			
Risk management measur the processes.	es at the process level (e.g.	containment or segregation	of the emission source) are	generally not required in	
Technical conditions and	d measures to control disp	ersion from source towar	ds the worker		
PROC	Level of separation	Localised controls (LC)	Efficiency of LC (according to MEASE)	Further information	
PROC 1	Any potentially required separation of workers	not required	na	-	
PROC 2, 3	from the emission source is indicated above under "Frequency and duration	general ventilation	17 %	-	
PROC 7	of exposure". A reduction of exposure duration can	integrated local exhaust ventilation	84 %	-	
PROC 19	be achieved, for example, by the installation of ventilated	not applicable	na	-	
All other applicable PROCs	(positive pressure) control rooms or by removing the worker from workplaces involved with relevant exposure.	local exhaust ventilation	78 %	-	

Trade name: create date: 01.12.2010	ŀ	Half-calcined Dolomit revision date: 09.12.2010	e	print date: 09.12.2010
Organisational measures	to prevent /limit releases	, dispersion and exposure	•	
measures involve good per smoking at the workplace,	rsonal and housekeeping pr the wearing of standard wo	actices (i.e. regular cleaning rking clothes and shoes unle	d to ensure a safe handling g with suitable cleaning devi ess otherwise stated below. ow dust off with compresse	ces), no eating and Shower and change
Conditions and measure	s related to personal prote	ection, hygiene and health	evaluation	
PROC	Specification of respiratory protective equipment (RPE)	RPE efficiency (assigned protection factor, APF)	Specification of gloves	Further personal protective equipment (PPE)
PROC 1, 2, 3, 23, 25, 27b	not required	na		Eye protection equipment (e.g. goggles or visors)
PROC 4, 5, 7, 8a, 8b, 9, 17, 18,	FFP2 mask	APF=10	Since calcium potential contac magnesium carbonate eye can be exc oxide is considered as the nature and	must be worn, unless potential contact with the
PROC 10, 13, 14, 15, 16, 22, 24, 26, 27a	FFP1 mask	APF=4		eye can be excluded by the nature and type of
PROC 19	FFP3 mask	APF=20	irritating to skin, the use of protective gloves is mandatory for all process steps.	application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required

Any RPE as defined above shall only be worn if the following principles are implemented in parallel: The duration of work (compare with "duration of exposure" above) should reflect the additional physiological stress for the worker due to the breathing resistance and mass of the RPE itself, due to the increased thermal stress by enclosing the head. In addition, it shall be considered that the worker's capability of using tools and of communicating are reduced during the wearing of RPE.

For reasons as given above, the worker should therefore be (i) healthy (especially in view of medical problems that may affect the use of RPE), (ii) have suitable facial characteristics reducing leakages between face and mask (in view of scars and facial hair). The recommended devices above which rely on a tight face seal will not provide the required protection unless they fit the contours of the face properly and securely.

The employer and self-employed persons have legal responsibilities for the maintenance and issue of respiratory protective devices and the management of their correct use in the workplace. Therefore, they should define and document a suitable policy for a respiratory protective device programme including training of the workers.

An overview of the APFs of different RPE (according to BS EN 529:2005) can be found in the glossary of MEASE.

2.2 Control of environmental exposure

Amounts used

The daily and annual amount per site (for point sources) is not considered to be the main determinant for environmental exposure.

Frequency and duration of use

Intermittent (< 12 time per year) or continuous use/release

Environment factors not influenced by risk management

Flow rate of receiving surface water: 18000 m³/day

Other given operational conditions affecting environmental exposure

Effluent discharge rate: 2000 m³/day

Technical onsite conditions and measures to reduce or limit discharges, air emissions and releases to soil

Risk management measures related to the environment aim to avoid discharging lime solutions into municipal wastewater or to surface water, in case such discharges are expected to cause significant pH changes. Regular control of the pH value during introduction into open waters is required. In general discharges should be carried out such that pH changes in receiving surface waters are minimised (e.g. through neutralisation). In general most aquatic organisms can tolerate pH values in the range of 6-9. This is also reflected in the description of standard OECD tests with aquatic organisms. The justification for this risk management measure can be found in the introduction section.

Conditions and measures related to waste

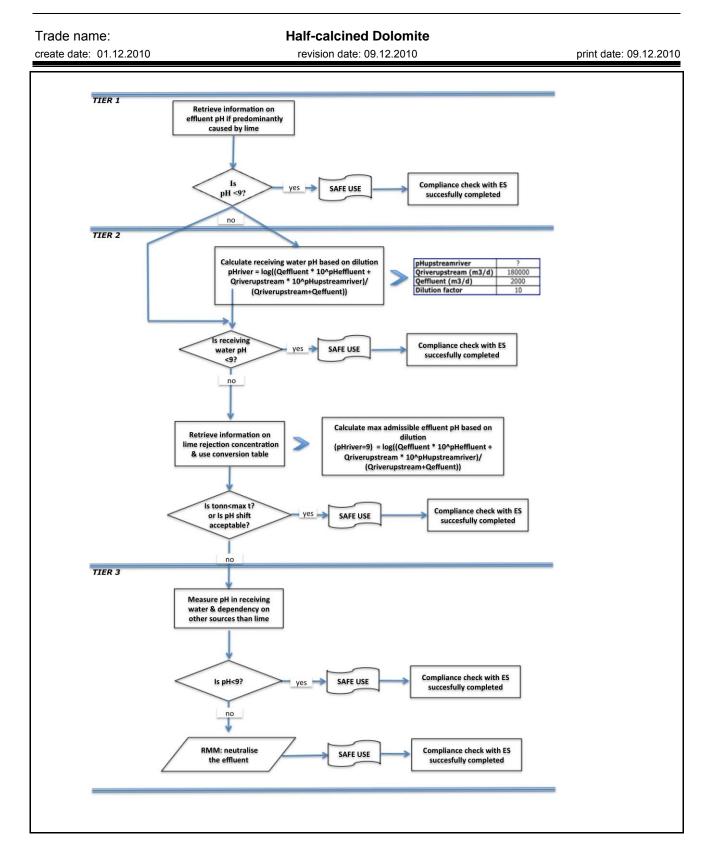
Solid industrial waste of lime should be reused or discharged to the industrial wastewater and further neutralized if needed.

to be worn as

3. Exposure estimati		revision date: 09.12.2010		print date: 09.12.201		
	ion and reference to	its source				
Occupational exposure						
quotient of the refined expo use. For inhalation exposur and the respective inhalatio	osure estimate and the response re, the RCR is based on the	ective DNEL (derived no-eff DNEL for calcium magnesi d using MEASE (as inhalab	exposure. The risk character fect level) and has to be belo um carbonate oxide of 1 mg ble dust). Thus, the RCR incl ccording to EN 481.	ow 1 to demonstrate a saf /m³ (as respirable dust)		
PROC	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)		
PROC 1, 2, 3, 4, 5, 7, 8a, 8b, 9, 10, 13, 14, 15, 16, 17, 18, 19, 22, 23, 24, 25, 26, 27a, 27b	MEASE	<1 mg/m³ (0.01 – 0.96)	Since calcium magnes considered as irritating to s to be minimised as far a DNEL for dermal effects ha dermal exposure is not a scen	skin, dermal exposure has is technically feasible. A as not been derived. Thus ssessed in this exposure		
Environmental emissions						
high water solubility and ve water. Significant emissions Significant emissions or exp assessment for the aquatic	ery low vapour pressure indic s or exposure to air are not posure to the terrestrial envi- e environment will therefore of the local scale. The exposure se above 9. The production of calcium to	cate that calcium magnesiun expected due to the low var ironment are not expected e only deal with the possible p assessment is approached magnesium carbonate oxide		und predominantly in gnesium carbonate oxide ario. The exposure and surface water related oH impact: the surface aquatic emission and		
Environmental emissions Exposure	The production of calcium magnesium carbonate oxide can potentially result in an aquatic emission and locally increase the calcium and magnesium concentrations and affect the pH in the aquatic environment. When the pH is not neutralised, the discharge of effluent from calcium magnesium carbonate oxide production sites may impact the pH in the receiving water. The pH of effluents is normally measured very frequently and can be neutralised easily as often required by national laws. Waste water from calcium magnesium carbonate oxide production is an inorganic wastewater stream and					
concentration in waste water treatment plant (WWTP)	carbonate oxide production	n sites will normally not be tr	reated in biological waste wa	therefore there is no biological treatment. Therefore, wastewater streams from calcium magnesium carbonate oxide production sites will normally not be treated in biological waste water treatment plants (WWTPs), but can be used for pH control of acid wastewater streams that are treated in biological WWTPs		
	When calcium magnesium	carbonate oxide is emitted				
Exposure concentration in aquatic pelagic compartment	general the buffer capacity	The higher the buffer capa preventing shifts in acidity of the second s second second sec	urface water, the pH may inc acity of the water, the lower t or alkalinity in natural waters	ted in biological WWTPs. particulate matter and rease, depending on the the effect on pH will be. In is regulated by the		
concentration in aquatic pelagic compartment Exposure concentration in sediments	general the buffer capacity equilibrium between carbon The sediment compartmen magnesium carbonate oxid	The higher the buffer capa preventing shifts in acidity of dioxide (CO2), the bicarbo t is not included in this ES, I	urface water, the pH may inc acity of the water, the lower to or alkalinity in natural waters onate ion (HCO3-) and the ca because it is not considered m carbonate oxide is emitted	ted in biological WWTPs. particulate matter and rease, depending on the the effect on pH will be. In is regulated by the arbonate ion (CO32-). relevant for calcium		
concentration in aquatic pelagic compartment Exposure concentration in sediments Exposure concentrations in soil	general the buffer capacity equilibrium between carbon The sediment compartmen magnesium carbonate oxid compartment, sorption of to	The higher the buffer capa preventing shifts in acidity of dioxide (CO2), the bicarbo t is not included in this ES, le: when calcium magnesiun o sediment particles is negling.	urface water, the pH may inc acity of the water, the lower to or alkalinity in natural waters onate ion (HCO3-) and the ca because it is not considered m carbonate oxide is emitted	ted in biological WWTPs. particulate matter and rease, depending on the the effect on pH will be. In is regulated by the arbonate ion (CO32-). relevant for calcium d to the aquatic		
concentration in aquatic pelagic compartment Exposure concentration in	general the buffer capacity equilibrium between carbon The sediment compartmen magnesium carbonate oxid compartment, sorption of to The terrestrial compartmen relevant. The air compartment is not magnesium carbonate oxid oxide is neutralised as a re Subsequently, the salts (e.j	The higher the buffer capa preventing shifts in acidity of dioxide (CO2), the bicarbo t is not included in this ES, l e: when calcium magnesium o sediment particles is neglin it is not included in this expo included in this CSA becau- le: when emitted to air as an sult of its reaction with CO2 g. calcium(bi)carbonate) are	urface water, the pH may inc acity of the water, the lower to or alkalinity in natural waters onate ion (HCO3-) and the ca because it is not considered m carbonate oxide is emitted gible.	ted in biological WWTPs. particulate matter and rease, depending on the the effect on pH will be. In is regulated by the arbonate ion (CO32-). relevant for calcium d to the aquatic ant for calcium nagnesium carbonate - and Ca2+. d thus the atmospheric		
concentration in aquatic pelagic compartment Exposure concentration in sediments Exposure concentrations in soil and groundwater Exposure concentration in atmospheric	general the buffer capacity equilibrium between carbon The sediment compartmen magnesium carbonate oxid compartment, sorption of to The terrestrial compartment relevant. The air compartment is not magnesium carbonate oxid oxide is neutralised as a re Subsequently, the salts (e. emissions of neutralised carbon table)	The higher the buffer capa preventing shifts in acidity of dioxide (CO2), the bicarbo t is not included in this ES, I le: when calcium magnesium o sediment particles is negligent is not included in this expo is included in this CSA becau le: when emitted to air as ar sult of its reaction with CO2 g. calcium(bi)carbonate) are alcium magnesium carbonat	urface water, the pH may inc acity of the water, the lower to or alkalinity in natural waters onate ion (HCO3-) and the ca because it is not considered m carbonate oxide is emitted gible. osure scenario, because it is use it is considered not relevan a aerosol in water, calcium n e (or other acids), into HCO3 e washed out from the air an	ted in biological WWTPs. particulate matter and rease, depending on the the effect on pH will be. In is regulated by the arbonate ion (CO32-). relevant for calcium d to the aquatic anot considered to be ant for calcium nagnesium carbonate - and Ca2+. d thus the atmospheric il and water.		

The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below. If measured data are not available, the DU may make use of an appropriate scaling tool such as MEASE (www.ebrc.de/mease.html) to estimate the associated exposure. The dustiness of the substance used can be determined according to the MEASE glossary. For example, substances with a dustiness less than 2.5 % according to the Rotating Drum Method (RDM) are defined as "low dusty", substances with a dustiness less than 10 % (RDM) are defined as "medium dusty" and substances with a dustiness ≥10 % are defined as "high dusty".

Trade name: create date: 01.12.2010	Half-calcined Dolomite revision date: 09.12.2010	print date: 09.12.201
DNEL _{inhalation} : 1 mg/m ³ (as re	espirable dust)	
a level of 4 mg/m ³ . By demonstrating therefore also covered (according to F by a factor of 2). When using MEASE	are of the fact that apart from the long-term DNEL given above, a a safe use when comparing exposure estimates with the long-ter R.14 guidance, acute exposure levels can be derived by multiplying for the derivation of exposure estimates, it is noted that the export ment measure (leading to an exposure reduction of 40 %).	m DNEL, the acute DNEL is ng long-term exposure estimates
Environmental exposure		
more site-specific assessment. For th Tier 1 : retrieve information on effluent the pH be above 9 and be predomina Tier 2a : retrieve information on receiv	ditions stipulated in the safe use ES, it is recommended to apply a at assessment, the following stepwise approach is recommended t pH and the contribution of the calcium magnesium carbonate ox ntly attributable to lime, then further actions are required to demo ing water pH after the discharge point. The pH of the receiving w he pH in the river can be calculated as follows:	d. kide on the resulting pH. Should onstrate safe use.
$pHriver = Log \boxed{\frac{Qeffluent * 1}{2}}$	$\frac{10^{pHeffluent} + Qriverupstream * 10^{pHupstream}}{Qriverupstream + Qeffluent}$	
L	(Eq 1)	
Where:	(Eq 1)	
Q effluent refers to the efflu	ent flow (in m ³ /day)	
	he upstream river flow (in m³/day)	
pH effluent refers to the pH		
	the pH of the river upstream of the discharge point	
Please note that initially, de		
•	flows: use the 10th of existing measurements distribution or use	default value of 18000 m³/dav
•	afault value of 2000 m³/day	
	l is preferably a measured value. If not available, one can assur	me a neutral pH of 7 if this can b
Such equation has to be seen as a we	orst case scenario, where water conditions are standard and not	case specific.
of the river is set at value 9 and pH of As temperature influences lime solubi admissible pH value in the effluent is that there is no buffer capacity conditi is available). Maximum load of lime th	entify which effluent pH causes an acceptable pH level in the rec the effluent is calculated accordingly (using default values as rep lity, pH effluent might require to be adjusted on a case-by-case b established, it is assumed that the OH- concentrations are all dep ons to consider (this is a unrealistic worst case scenario, which c at can be annually rejected without negatively affecting the pH of expressed as moles/litre are multiplied by average flow of the effluen carbonate oxide	ported previously, if necessary). basis. Once the maximum bendent on lime discharge and an be modified where information f the receiving water is calculated
Tier 3: measure the pH in the receivir	ng water after the discharge point. If pH is below 9, safe use is reactive 9, risk management measures have to be implemented: the	



Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

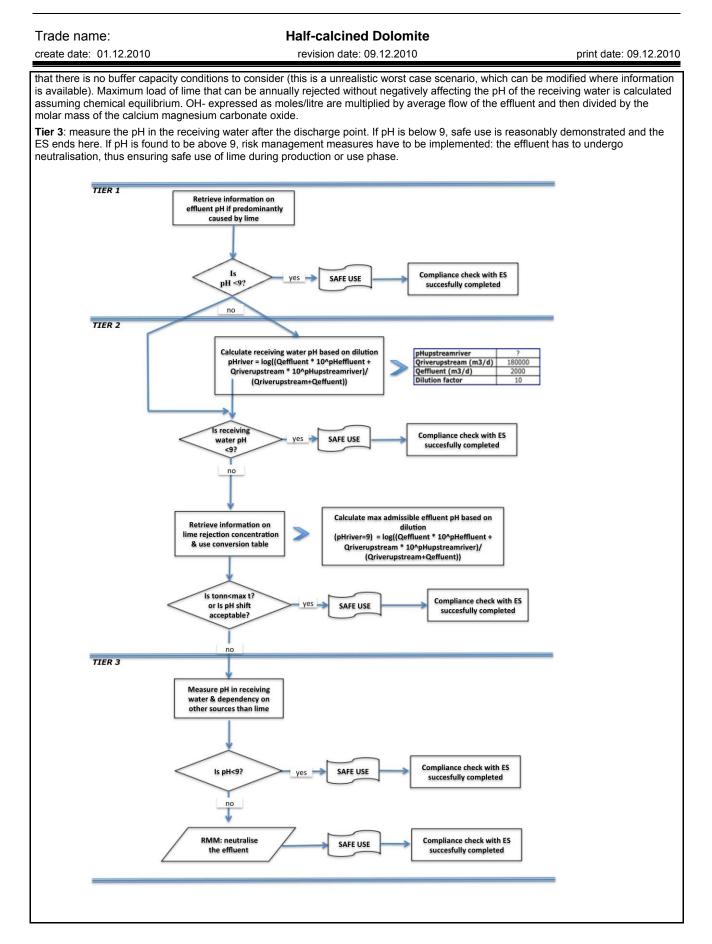
ES number 9.5: Manufacture and industrial uses of massive objects containing lime substances

Exposure Scenario	Format (1) addressin	g uses carried out by	/ workers		
1. Title					
Free short title	Manufactur	e and industrial uses of mas	sive objects containing lime	substances	
Systematic title based on use descriptor	SU3, SU1, SU2a, SU2b, SU4, SU5, SU6a, SU6b, SU7, SU8, SU9, SU10, SU11, SU12, SU13, SU14, SU15, SU16, SU17, SU18, SU19, SU20, SU23, SU24 PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC36, PC37, PC38, PC39, PC40 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13 (appropriate PROCs and ERCs are given in Section 2 below)				
Processes, tasks and/or activities covered	Processes, tasks and/or activities covered are described in Section 2 below.				
Assessment Method	The assessment	of inhalation exposure is bas	sed on the exposure estima	tion tool MEASE.	
2. Operational cond	itions and risk mana	gement measures			
PROC/ERC	REACH	definition	Involve	d tasks	
PROC 6	Calendering	g operations	Further information is provided in the ECHA Guidance on information requirements and chem safety assessment, Chapter R.12: Use descript system (ECHA-2010-G-05-EN)		
PROC 14	compression, extr	ns or articles by tabletting, usion, pelletisation			
PROC 21	materials ar	n of substances bound in nd/or articles			
PROC 22	minerals/metals at e Industria	essing operations with elevated temperature al setting			
PROC 23		ransfer operations with levated temperature			
PROC 24		y work-up of substances als and/or articles			
PROC 25	Other hot work ope	erations with metals	7		
ERC 1-7, 12	us	and all types of industrial ses	-		
ERC 10, 11		and indoor use of long-life d materials	1		
2.1 Control of worke	ers exposure				
Product characteristic					
reflected by an assignmen temperature the fugacity is taking into account the pro	t of a so-called fugacity clast based on the dustiness of	insic emission potential is or s in the MEASE tool. For op that substance. Whereas in h helting point of the substance emission potential.	erations conducted with soli not metal operations, fugacit	d substances at ambient ty is temperature based,	
PROC	Use in preparation	Content in preparation	Physical form	Emission potential	
PROC 22, 23,25	not res	stricted	massive objects, molten	high	
PROC 24	not res	stricted	massive objects	high	
All other applicable PROCs	not res	stricted	massive objects	very low	
Amounts used					
the scale of operation (indu		I to influence the exposure a level of containment/automa			

Trade name: create date: 01.12.2010	ŀ	Half-calcined Dolomit revision date: 09.12.2010	e	print date: 09.12.2010
Frequency and duration	of use/exposure			
PROC		Duration o	f exposure	
PROC 22		≤ 240 n		
All other applicable PROCs		480 minutes (not restricted)	
	nced by risk management			
The shift breathing volume	during all process steps ref	lected in the PROCs is assu	umed to be 10 m ³ /shift (8 ho	urs).
Other given operational of	conditions affecting worke	ers exposure		
assessment of the conduct assessment in MEASE is h expected to vary within the	process temperature and p ted processes. In process st nowever based on the ratio of industry the highest ratio w automatically covered in this	eps with considerably high t of process temperature and as taken as a worst case as	temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e	, 23, 25), the exposure ated temperatures are
	I measures at process leve	<u> </u>		
Risk management measur the processes.	es at the process level (e.g.	containment or segregation	n of the emission source) a	e generally not required in
Technical conditions and	I measures to control disp	ersion from source towar	ds the worker	
PROC	Level of separation	Localised controls (LC)	Efficiency of LC (according to MEASE)	Further information
PROC 6, 14, 21	Any potentially required separation of workers	not required	na	-
PROC 22, 23, 24, 25	from the emission source is indicated above under "Frequency and duration of exposure". A reduction of exposure duration can be achieved, for example, by the installation of ventilated (positive pressure) control rooms or by removing the worker from workplaces involved with relevant exposure.	local exhaust ventilation	78 %	-
Organisational measures	to prevent /limit releases	, dispersion and exposure		
measures involve good per smoking at the workplace,	on. General occupational hy rsonal and housekeeping pr the wearing of standard wo Do not wear contaminated	actices (i.e. regular cleaning king clothes and shoes unle	y with suitable cleaning devi- ess otherwise stated below.	ces), no eating and Shower and change
Conditions and measure	s related to personal prote	ection, hygiene and health	evaluation	
PROC	Specification of respiratory protective equipment (RPE)	RPE efficiency (assigned protection factor, APF)	Specification of gloves	Further personal protective equipment (PPE)
PROC 22	FFP1 mask	APF=4	Since calcium magnesium carbonate oxide is considered as	Eye protection equipment (e.g. goggles or visors) must be worn, unless potential contact with the eye can be excluded by the nature and type of
All other applicable PROCs	not required	na	irritating to skin, the use of protective gloves is mandatory for all process steps.	application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required to be worn as appropriate.

Trade name:	ŀ	alf-calcined Dolomit	e		
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
the management of their constructive device program	The employer and self-employed persons have legal responsibilities for the maintenance and issue of respiratory protective devices and the management of their correct use in the workplace. Therefore, they should define and document a suitable policy for a respiratory protective device programme including training of the workers. An overview of the APFs of different RPE (according to BS EN 529:2005) can be found in the glossary of MEASE.				
2.2 Control of enviro					
Amounts used					
The daily and annual amou	unt per site (for point source	s) is not considered to be th	e main determinant for envi	ronmental exposure.	
Frequency and duration	of use				
Intermittent (< 12 time per	year) or continuous use/rele	ase			
Environment factors not	influenced by risk manage	ement			
Flow rate of receiving surfa	ace water: 18000 m³/day				
Other given operational of	conditions affecting enviro	onmental exposure			
Effluent discharge rate: 20	00 m³/day				
Technical onsite condition	ons and measures to redu	ce or limit discharges, air	emissions and releases to	soil	
water, in case such discha open waters is required. In (e.g. through neutralisation	rges are expected to cause general discharges should a). In general most aquatic o	significant pH changes. Reg be carried out such that pH rganisms can tolerate pH va	ime solutions into municipal gular control of the pH value changes in receiving surface alues in the range of 6-9. The is risk management measur	during introduction into e waters are minimised is is also reflected in the	
Conditions and measure	s related to waste				
Solid industrial waste of lin	ne should be reused or discl	narged to the industrial wast	ewater and further neutraliz	ed if needed.	
3. Exposure estimat	ion and reference to	its source			
Occupational exposure					
quotient of the refined expo use. For inhalation exposu and the respective inhalation	osure estimate and the resp re, the RCR is based on the	ective DNEL (derived no-eff DNEL for calcium magnesi d using MEASE (as inhalab	exposure. The risk character fect level) and has to be belo um carbonate oxide of 1 mg ble dust). Thus, the RCR incl coording to EN 481	ow 1 to demonstrate a safe /m³ (as respirable dust)	
Method used for Inhalation exposure Method used for dermal Dermal exposure					
PROC	inhalation exposure assessment	estimate (RCR)	exposure assessment	estimate (RCR)	
PROC 6, 14, 21, 22, 23, 24, 25	MEASE	< 1 mg/m³ (0.01 – 0.44)	considered as irritating to a to be minimised as far a DNEL for dermal effects ha	as technically feasible. A as not been derived. Thus, ssessed in this exposure	
Environmental emissions	5				
The environmental exposure assessment is only relevant for the aquatic environment, when applicable including STPs/WWTPs, as emissions of calcium magnesium carbonate oxide in the different life-cycle stages (production and use) mainly apply to (waste) water. The aquatic effect and risk assessment only deal with the effect on organisms/ecosystems due to possible pH changes related to OH-discharges, being the toxicity of Ca2+ and Mg2+ is expected to be negligible compared to the (potential) pH effect. Only the local scale is being addressed, including municipal sewage treatment plants (STPs) or industrial waste water treatment plants (WWTPs) when applicable, both for production and industrial use as any effects that might occur would be expected to take place on a local scale. The high water solubility and very low vapour pressure indicate that calcium magnesium carbonate oxide will be found predominantly in water. Significant emissions or exposure to air are not expected due to the low vapour pressure of calcium magnesium carbonate oxide. Significant emissions or exposure to the terrestrial environment are not expected either for this exposure scenario. The exposure assessment for the aquatic environment will therefore only deal with the possible pH changes in STP effluent and surface water related to the OH- discharges at the local scale. The exposure assessment is approached by assessing the resulting pH impact: the surface water pH should not increase above 9.					
Environmental emissions	locally increase the calciun When the pH is not neutral production sites may impa	n and magnesium concentra ised, the discharge of efflue	e can potentially result in an ations and affect the pH in th ent from calcium magnesium ater. The pH of effluents is no red by national laws.	ne aquatic environment. carbonate oxide	
Exposure concentration in waste water treatment plant (WWTP)	Waste water from calcium therefore there is no biolog carbonate oxide production	magnesium carbonate oxide ical treatment. Therefore, w n sites will normally not be tr	e production is an inorganic astewater streams from calc reated in biological waste wa ewater streams that are trea	cium magnesium ater treatment plants	

Trade name: create date: 01.12.2010	Half-calcined Dolomiterevision date: 09.12.2010print date: 09.12.2010
Exposure concentration in aquatic pelagic compartment	When calcium magnesium carbonate oxide is emitted to surface water, sorption to particulate matter and sediment will be negligible. When lime is rejected to surface water, the pH may increase, depending on the buffer capacity of the water. The higher the buffer capacity of the water, the lower the effect on pH will be. In general the buffer capacity preventing shifts in acidity or alkalinity in natural waters is regulated by the equilibrium between carbon dioxide (CO2), the bicarbonate ion (HCO3-) and the carbonate ion (CO32-).
Exposure concentration in sediments	The sediment compartment is not included in this ES, because it is not considered relevant for calcium magnesium carbonate oxide: when calcium magnesium carbonate oxide is emitted to the aquatic compartment, sorption of to sediment particles is negligible.
Exposure concentrations in soil and groundwater	The terrestrial compartment is not included in this exposure scenario, because it is not considered to be relevant.
Exposure concentration in atmospheric compartment	The air compartment is not included in this CSA because it is considered not relevant for calcium magnesium carbonate oxide: when emitted to air as an aerosol in water, calcium magnesium carbonate oxide is neutralised as a result of its reaction with CO2 (or other acids), into HCO3- and Ca2+. Subsequently, the salts (e.g. calcium(bi)carbonate) are washed out from the air and thus the atmospheric emissions of neutralised calcium magnesium carbonate oxide largely end up in soil and water.
Exposure concentration relevant for the food chain (secondary poisoning)	Bioaccumulation in organisms is not relevant for calcium magnesium carbonate oxide: a risk assessment for secondary poisoning is therefore not required.
4. Guidance to DU	to evaluate whether he works inside the boundaries set by the ES
Occupational exposure	
downstream user can der adequate. This has to be (given that the processes available, the DU may ma exposure. The dustiness dustiness less than 2.5 % than 10 % (RDM) are def DNEL _{inhalation} : 1 mg Important note: The DU h a level of 4 mg/m ³ . By de therefore also covered (a	boundaries set by the ES if either the proposed risk management measures as described above are met or the nonstrate on his own that his operational conditions and implemented risk management measures are done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL and activities in question are covered by the PROCs listed above) as given below. If measured data are not ake use of an appropriate scaling tool such as MEASE (www.ebrc.de/mease.html) to estimate the associated of the substance used can be determined according to the MEASE glossary. For example, substances with a according to the Rotating Drum Method (RDM) are defined as "low dusty", substances with a dustiness less ined as "medium dusty" and substances with a dustiness ≥10 % are defined as "high dusty". g/m ³ (as respirable dust) as to be aware of the fact that apart from the long-term DNEL given above, a DNEL for acute effects exists at monstrating a safe use when comparing exposure estimates with the long-term DNEL, the acute DNEL is ccording to R.14 guidance, acute exposure levels can be derived by multiplying long-term exposure estimates
reduced to half-shift as a	sing MEASE for the derivation of exposure estimates, it is noted that the exposure duration should only be risk management measure (leading to an exposure reduction of 40 %).
Environmental exposur	
more site-specific assess	with the conditions stipulated in the safe use ES, it is recommended to apply a tiered approach to perform a ment. For that assessment, the following stepwise approach is recommended.
	n on effluent pH and the contribution of the calcium magnesium carbonate oxide on the resulting pH. Should e predominantly attributable to lime, then further actions are required to demonstrate safe use.
Tier 2a: retrieve informati	on on receiving water pH after the discharge point. The pH of the receiving water shall not exceed the value of tavailable, the pH in the river can be calculated as follows:
$pHriver = Log \boxed{\frac{Qe}{2}}$	$\frac{ffluent * 10^{pHeffluent} + Qriverupstream * 10^{pHupstream}}{Qriverupstream + Qeffluent}$
L	$Qriverupstream + Qeffluent \qquad [Eq 1]$
Where:	(Eq 1)
	s to the effluent flow (in m³/day)
	m refers to the upstream river flow (in m³/day)
	rs to the pH of the effluent
•	ver refers to the pH of the river upstream of the discharge point
Please note that	at initially, default values can be used:
Q rive	er upstream flows: use the 10th of existing measurements distribution or use default value of 18000 m³/day
Q eff	uent: use default value of 2000 m³/day
 The u justif 	upstream pH is preferably a measured value. If not available, one can assume a neutral pH of 7 if this can be ed.
Tier 2b : Equation 1 can b of the river is set at value As temperature influence	seen as a worst case scenario, where water conditions are standard and not case specific. In used to identify which effluent pH causes an acceptable pH level in the receiving body. In order to do so, pH 9 and pH of the effluent is calculated accordingly (using default values as reported previously, if necessary). In the solubility, pH effluent might require to be adjusted on a case-by-case basis. Once the maximum e effluent is established, it is assumed that the OH- concentrations are all dependent on lime discharge and

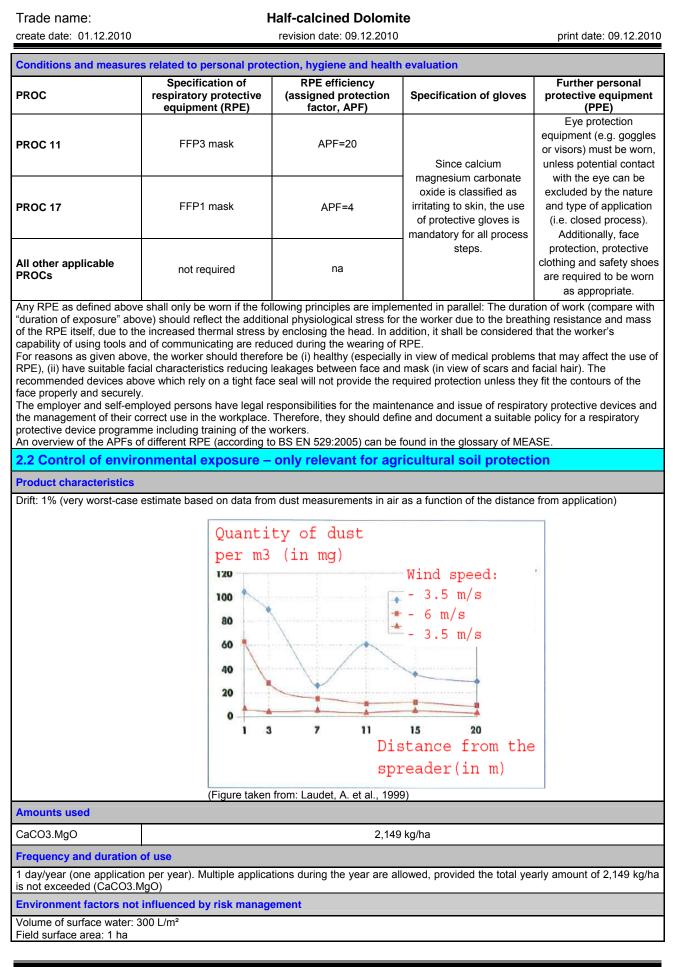


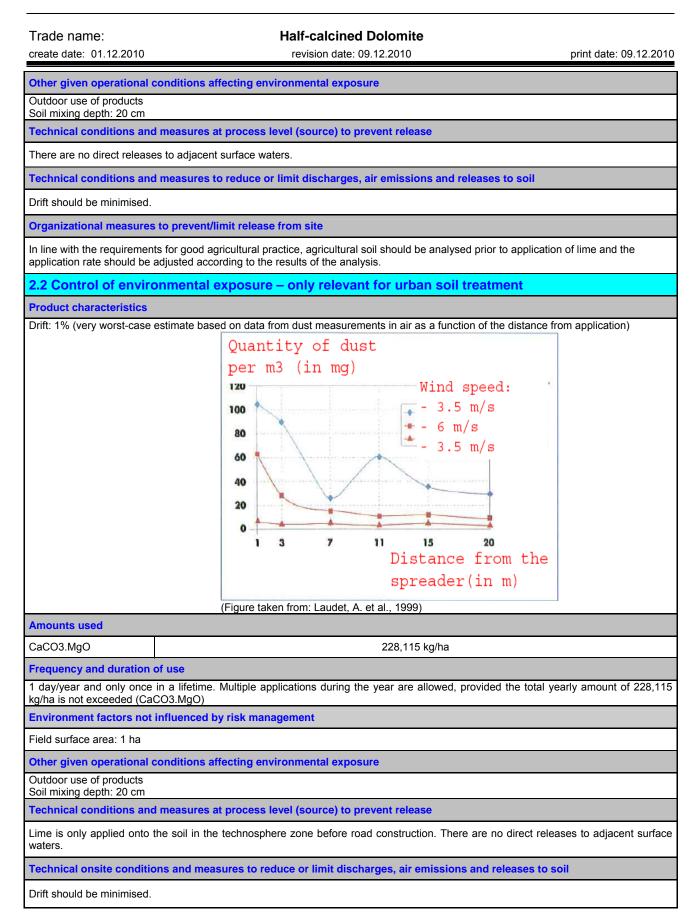
Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.6: Professional uses of aqueous solutions of lime substances

Exposure Scenario	Format (1) addressing uses carried out by	y workers		
1. Title				
Free short title	Professional uses of aqueous solutions of lime substances			
		U12, SU13, SU16, SU17, SU18, SU19, SU20, SU23,		
Systematic title based on use descriptor	PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC PC36, PC37, AC1, AC2, AC3, AC4, AC5, AC6	J24 212, PC13, PC14, PC15, PC16, PC17, PC18, PC19, 28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC39, PC40 5, AC7, AC8, AC10, AC11, AC13 s are given in Section 2 below)		
Processes, tasks and/or activities covered	Processes, tasks and/or activities cov	ered are described in Section 2 below.		
Assessment Method		d on the exposure estimation tool MEASE. The sased on FOCUS-Exposit.		
2. Operational cond	itions and risk management measures			
PROC/ERC	REACH definition	Involved tasks		
PROC 2	Use in closed, continuous process with occasional controlled exposure			
PROC 3	Use in closed batch process (synthesis or formulation)			
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises			
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)			
PROC 8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities			
PROC 8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities	Further information is provided in the ECHA		
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	Guidance on information requirements and chemical safety assessment, Chapter R.12: Use descriptor		
PROC 10	Roller application or brushing	system (ECHA-2010-G-05-EN).		
PROC 11	Non industrial spraying			
PROC 12	Use of blowing agents in manufacture of foam			
PROC 13	Treatment of articles by dipping and pouring			
PROC 15	Use as laboratory reagent			
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected			
PROC 17	Lubrication at high energy conditions and in partly open process			
PROC 18	Greasing at high energy conditions			
PROC 19	Hand-mixing with intimate contact and only PPE available			
ERC2, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f	Wide dispersive indoor and outdoor use of reactive substances or processing aids in open systems	Calcium magnesium carbonate oxide is applied in numerous cases of wide dispersive uses: agricultural, forestry, fish and shrimps farming, soil treatment and environmental protection.		

Trade name:	Half-calcined Dolomite				
create date: 01.12.2010	revision date: 09.12.2010 print date: 09.1			print date: 09.12.2010	
2.1 Control of worke	ers exposure				
Product characteristic					
reflected by an assignmen temperature the fugacity is taking into account the pro	t of a so-called fugacity clas based on the dustiness of t cess temperature and the m id of the substance intrinsic	s in the MEASE tool. For op hat substance. Whereas in I nelting point of the substance	ne of the main exposure det erations conducted with soli hot metal operations, fugacit e. As a third group, high abra aying of aqueous solutions (l	d substances at ambient ty is temperature based, asive tasks are based on	
PROC	Use in preparation	Content in preparation	Physical form	Emission potential	
All applicable PROCs	not res	stricted	aqueous solution	very low	
Amounts used					
the scale of operation (indu determinant of the process	ustrial vs. professional) and intrinsic emission potential.	level of containment/automa	s such for this scenario. Inst tion (as reflected in the PRC		
Frequency and duration	of use/exposure				
PROC		Duration o	f exposure		
PROC 11		≤ 240 n	ninutes		
All other applicable PROCs		480 minutes (not restricted)		
Human factors not influe	nced by risk management	:			
The shift breathing volume	during all process steps ref	lected in the PROCs is assu	imed to be 10 m³/shift (8 ho	urs).	
Other given operational of	conditions affecting worke	ers exposure			
	Since aqueous solutions are not used in hot-metallurgical processes, operational conditions (e.g. process temperature and process pressure) are not considered relevant for occupational exposure assessment of the conducted processes.				
Technical conditions and	I measures at process leve	el (source) to prevent relea	ase		
Risk management measur the processes.	es at the process level (e.g.	. containment or segregation	n of the emission source) ar	e generally not required in	
Technical conditions and	I measures to control disp	ersion from source towar	ds the worker		
PROC	Level of separation	Localised controls (LC)	Efficiency of LC (according to MEASE)	Further information	
PROC 19	Separation of workers from the emission source is generally not required	not applicable	na	-	
All other applicable PROCs	in the conducted processes.	not required	na	-	
Organisational measures to prevent /limit releases, dispersion and exposure					
Avoid inhalation or ingestion. General occupational hygiene measures are required to ensure a safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no eating and smoking at the workplace, the wearing of standard working clothes and shoes unless otherwise stated below. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home. Do not blow dust off with compressed air.					





Trade name:	ŀ	Half-calcined Dolomit	e		
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
3. Exposure estimation and reference to its source					
Occupational exposure					
The exposure estimation tool MEASE was used for the assessment of inhalation exposure. The risk characterisation ratio (RCR) is the quotient of the refined exposure estimate and the respective DNEL (derived no-effect level) and has to be below 1 to demonstrate a safe use. For inhalation exposure, the RCR is based on the DNEL for calcium magnesium carbonate oxide of 1 mg/m ³ (as respirable dust) and the respective inhalation exposure estimate derived using MEASE (as inhalable dust). Thus, the RCR includes an additional safety margin since the respirable fraction being a sub-fraction of the inhalable fraction according to EN 481.					
PROC	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)	
PROC 2, 3, 4, 5, 8a, 8b, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19	MEASE	< 1 mg/m³ (<0.001 – 0.6)	Since calcium magnesi classified as irritating to ski be minimised as far as teo for dermal effects has n dermal exposure is not as scen	n, dermal exposure has to hnically feasible. A DNEL tot been derived. Thus, ssessed in this exposure	
Environmental exposure	for agricultural soil prote	ction			
calculation of predicted en sediment (Kloskowksi et al agricultural-like application typically developed for bio parameters such as drifts can indeed migrate then to Environmental	vironmental concentration v I., 1999). The FOCUS/EXPC as in this case where parar cidal applications and was fu	alues (PEC) of plant protecti DSIT modelling tool is prefer neter as the drift needs to bu urther elaborated on the bas to collected data: once appli	up (FOCUS, 1996) and on the ion products for soil, ground red to the EUSES as it is modelling. e included in the modelling. is of the German EXPOSIT ed on the soil, calcium mage	water, surface water and ore appropriate for FOCUS is a model 1.0 model, where	
emissions Exposure					
concentration in waste water treatment plant (WWTP)	Not relevant for agricultura	I soil protection			
Exposure concentration in	Substance	PEC (ug/L)	PNEC (ug/L)	RCR	
aquatic pelagic compartment	CaCO3.MgO	7.16	470	0.015	
Exposure concentration in sediments	waters the hydroxide ions Ca2+. The calcium carbon solubility and a constituent	react with HCO3– to form wa ate precipitates and deposite of natural soils.	sediment to lime is expected ater and CO32 CO32- form s on the sediment. Calcium	is CaCO3 by reacting with carbonate is of low	
Exposure concentrations in soil	Substance	PEC (mg/L)	PNEC (mg/L)	RCR	
and groundwater	CaCO3.MgO	632	1034	0.61	
Exposure concentration in atmospheric compartment	This point is not relevant. 0 10 ⁻⁵ Pa.	Calcium magnesium carbona	ate oxide is not volatile. The	vapour pressures is below	
Exposure concentration relevant for the food chain (secondary poisoning)	omnipresent and essential		carbonate oxide can be con es covered do not significant wironment.		
Environmental exposure	for urban soil treatment				
The urban soil treatment scenario is based on a road border scenario. At the special road border technical meeting (Ispra, September 5, 2003), EU Member States and industry agreed on a definition for a "road technosphere". The road technosphere can be defined as "the engineered environment that carries the geotechnical functions of the road in connection with its structure, operation and maintenance including the installations to ensure road safety and manage run off. This technosphere, which includes the hard and soft shoulder at the edge of the carriageway, is vertically dictated by the groundwater watertable. The road authority has responsibility for this road technosphere including road safety, road support, prevention of pollution and water management". The road technosphere was therefore excluded as assessment endpoint for risk assessment for the purpose of the existing/new substances regulations. The target zone is the zone beyond the technosphere, to which the environmental risk assessment applies. The PEC calculation for soil was based on the FOCUS soil group (FOCUS, 1996) and on the "draft guidance on the calculation of predicted environmental concentration values (PEC) of plant protection products for soil, ground water, surface water and sediment (Kloskowksi et al., 1999). The FOCUS/EXPOSIT modelling tool is preferred to the EUSES as it is more appropriate for agricultural-like applications and was further elaborated on the basis of the German EXPOSIT 1.0 model, where parameters such as drifts can be improved according to collected data.					
Environmental emissions	See amounts used				
Exposure	Not relevant for road borde	er scenario			

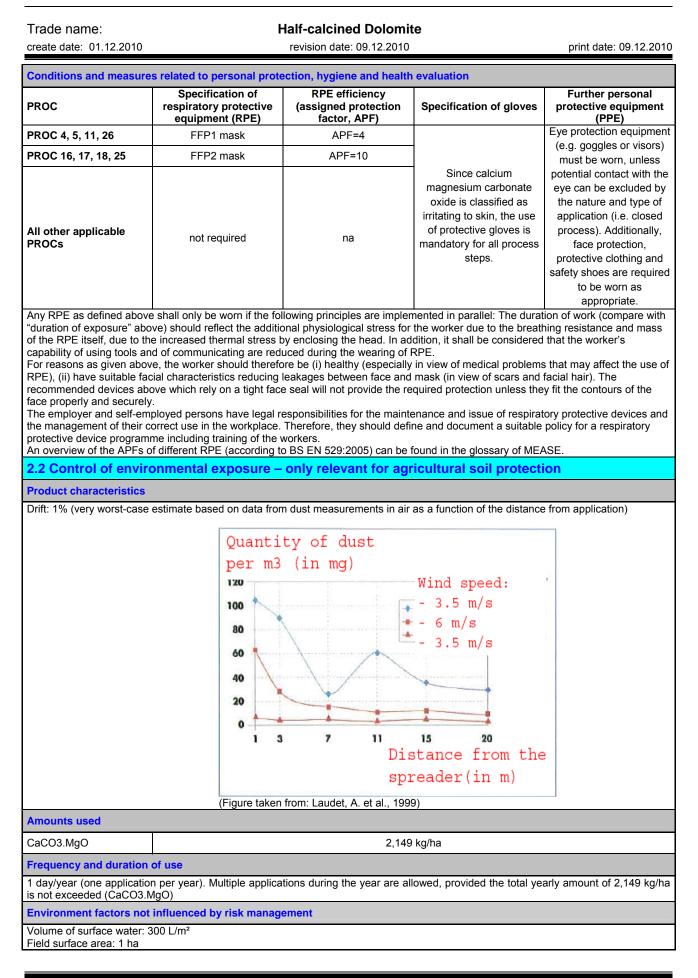
Trade name:	F	alf-calcined Dolomit	е		
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
concentration in waste water treatment plant (WWTP)					
Exposure concentration in aquatic pelagic compartment	Not relevant for road borde	Not relevant for road border scenario			
Exposure concentration in sediments	Not relevant for road borde	r scenario			
Exposure concentrations in soil	Substance	PEC (mg/L)	PNEC (mg/L)	RCR	
and groundwater	CaCO3.MgO	671	1034	0.65	
Exposure concentration in atmospheric compartment	This point is not relevant. C 10 ⁻⁵ Pa.	Calcium magnesium carbona	ate oxide is not volatile. The v	vapour pressures is below	
Exposure concentration relevant for the food chain (secondary poisoning)			idered to be omnipresent an uence the distribution of the		
Environmental exposure	for other uses				
 The operational protection or urb Lime is an ingre wastewater or s Lime is specifica compartment, w 	oan soil treatment dient and chemically bound urface water ally used to release CO2-free here the lime properties are	agement measures are les into a matrix. Releases are e breathable air, upon reacti exploited	ecause is stringent than those out e negligible and insufficient to ion with CO2. Such applicati pacts beyond those desired.	o cause a pH-shift in soil, ions only relates to the air	
4. Guidance to DU t	o evaluate whether he	e works inside the bo	oundaries set by the E	S	
The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below. If measured data are not available, the DU may make use of an appropriate scaling tool such as MEASE (<u>www.ebrc.de/mease.html</u>) to estimate the associated exposure. The dustiness of the substance used can be determined according to the MEASE glossary. For example, substances with a dustiness less than 2.5 % according to the Rotating Drum Method (RDM) are defined as "low dusty", substances with a dustiness less than 10 % (RDM) are defined as "medium dusty" and substances with a dustiness ≥10 % are defined as "high dusty".					
	/m ³ (as respirable dust	,			
Important note: The DU has to be aware of the fact that apart from the long-term DNEL given above, a DNEL for acute effects exists at a level of 4 mg/m ³ . By demonstrating a safe use when comparing exposure estimates with the long-term DNEL, the acute DNEL is therefore also covered (according to R.14 guidance, acute exposure levels can be derived by multiplying long-term exposure estimates by a factor of 2). When using MEASE for the derivation of exposure estimates, it is noted that the exposure duration should only be reduced to half-shift as a risk management measure (leading to an exposure reduction of 40 %).					

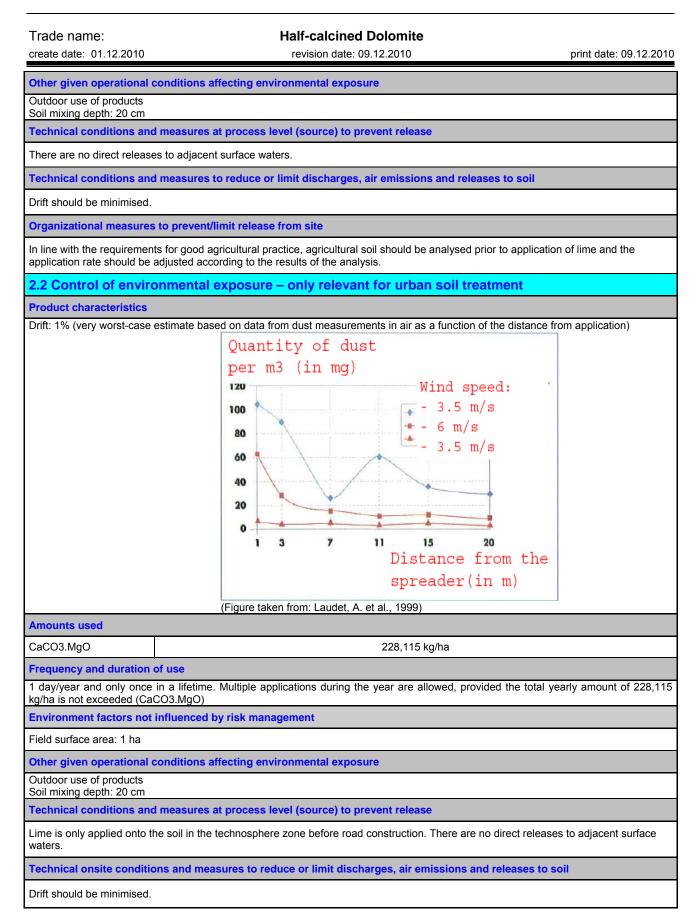
Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.7: Professional uses of low dusty solids/powders of lime substances

Exposure Scenario	Format (1) addressing uses carried out by	y workers		
1. Title				
Free short title	Professional uses of low dusty se	olids/powders of lime substances		
		5U12, SU13, SU16, SU17, SU18, SU19, SU20, SU23,		
Systematic title based on use descriptor	SU24 PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC36, PC37, PC39, PC40 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13 (appropriate PROCs and ERCs are given in Section 2 below)			
Processes, tasks and/or activities covered		ered are described in Section 2 below.		
Assessment Method		ed on the exposure estimation tool MEASE. The is based on FOCUS-Exposit.		
2. Operational cond	itions and risk management measures			
PROC/ERC	REACH definition	Involved tasks		
PROC 2	Use in closed, continuous process with occasional controlled exposure			
PROC 3	Use in closed batch process (synthesis or formulation)			
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises			
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)			
PROC 8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities			
PROC 8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities			
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)			
PROC 10	Roller application or brushing	Further information is provided in the ECHA		
PROC 11	Non industrial spraying	Guidance on information requirements and chemical		
PROC 13	Treatment of articles by dipping and pouring	safety assessment, Chapter R.12: Use descriptor system (ECHA-2010-G-05-EN).		
PROC 15	Use as laboratory reagent			
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected]		
PROC 17	Lubrication at high energy conditions and in partly open process]		
PROC 18	Greasing at high energy conditions	1		
PROC 19	Hand-mixing with intimate contact and only PPE available	1		
PROC 21	Low energy manipulation of substances bound in materials and/or articles			
PROC 25	Other hot work operations with metals	1		
PROC 26	Handling of solid inorganic substances at ambient temperature	1		
ERC2, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f	Wide dispersive indoor and outdoor use of reactive substances or processing aids in open systems			

Trade name: create date: 01.12.2010		Half-calcined Dolomit revision date: 09.12.2010	c	print date: 09.12.20
2.1 Control of work	ers exposure			
Product characteristic				
reflected by an assignmen temperature the fugacity is taking into account the pro	t of a so-called fugacity class based on the dustiness of t	insic emission potential is or s in the MEASE tool. For op that substance. Whereas in I elting point of the substance emission potential.	erations conducted with soli hot metal operations, fugacit	d substances at ambient y is temperature based,
PROC	Use in preparation	Content in preparation	Physical form	Emission potential
PROC 25	not res	stricted	solid/powder, molten	high
All other applicable PROCs	not res	stricted	solid/powder	low
Amounts used	ł			
the scale of operation (ind		to influence the exposure a level of containment/automa		
Frequency and duration	of use/exposure			
PROC		Duration o	f exposure	
PROC 17		≤ 240 n	ninutes	
All other applicable PROCs		480 minutes (not restricted)	
Human factors not influe	nced by risk management	t i i i i i i i i i i i i i i i i i i i		
The shift breathing volume	e during all process steps ref	flected in the PROCs is assu	imed to be 10 m ³ /shift (8 hou	urs).
Other given operational	conditions affecting worke	ers exposure		
assessment of the conduc assessment in MEASE is I expected to vary within the	ted processes. In process s nowever based on the ratio industry the highest ratio w	rocess pressure are not con teps with considerably high t of process temperature and ras taken as a worst case as s exposure scenario for PRC	emperatures (i.e. PROC 22, melting point. As the associa sumption for the exposure e	23, 25), the exposure ated temperatures are
		el (source) to prevent relea		
Risk management measur the processes.	es at the process level (e.g.	containment or segregation	of the emission source) are	generally not required i
•	d measures to control disp	persion from source toward	ds the worker	
PROC	Level of separation	Localised controls (LC)	Efficiency of LC (according to MEASE)	Further information
PROC 19	Any potentially required separation of workers from the emission source is indicated above under "Frequency and duration of exposure". A reduction of exposure duration can	not applicable	na	-
All other applicable PROCs	be achieved, for example, by the installation of ventilated (positive pressure) control rooms or by removing the worker from workplaces involved with relevant exposure.	not required	na	-
Organisational measures	s to prevent /limit releases	, dispersion and exposure		
measures involve good pe smoking at the workplace,	rsonal and housekeeping pi the wearing of standard wo	giene measures are required ractices (i.e. regular cleaning rking clothes and shoes unle I clothing at home. Do not bl	with suitable cleaning devices otherwise stated below.	ces), no eating and Shower and change





Trade name:	ŀ	Half-calcined Dolomit	e			
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010		
	3. Exposure estimation and reference to its source					
Occupational exposure						
quotient of the refined expo use. For inhalation exposu and the respective inhalation	ool MEASE was used for the osure estimate and the resp ire, the RCR is based on the on exposure estimate derive e fraction being a sub-fraction	ective DNEL (derived no-eff DNEL for calcium magnesi ed using MEASE (as inhalab	ect level) and has to be belo um carbonate oxide of 1 mg le dust). Thus, the RCR incl	w 1 to demonstrate a safe /m³ (as respirable dust)		
PROC	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)		
PROC 2, 3, 4, 5, 8a, 8b, 9, 10, 11, 13, 15, 16, 17, 18, 19, 21, 25, 26	MEASE	< 1 mg/m³ (0.01 – 0.75)	Since calcium magnesi classified as irritating to ski be minimised as far as teo for dermal effects has n dermal exposure is not as scen	in, dermal exposure has to chnically feasible. A DNEL not been derived. Thus, ssessed in this exposure		
Environmental exposure	for agricultural soil protec	ction				
calculation of predicted en sediment (Kloskowksi et al agricultural-like application typically developed for bioo parameters such as drifts of can indeed migrate then to	bil and surface water was ba vironmental concentration va I., 1999). The FOCUS/EXPC as in this case where parar cidal applications and was fu can be improved according to owards surface waters, via d	alues (PEC) of plant protecti DSIT modelling tool is prefer neter as the drift needs to bu urther elaborated on the bas to collected data: once appli	ion products for soil, ground red to the EUSES as it is mo e included in the modelling is of the German EXPOSIT	water, surface water and ore appropriate for FOCUS is a model 1.0 model, where		
Environmental emissions	See amounts used					
Exposure concentration in waste water treatment plant (WWTP)	Not relevant for agricultura					
Exposure concentration in	Substance	PEC (ug/L)	PNEC (ug/L)	RCR		
aquatic pelagic compartment	CaCO3.MgO	7.16	470	0.015		
Exposure concentration in sediments	waters the hydroxide ions r Ca2+. The calcium carbon solubility and a constituent	react with HCO3- to form wa ate precipitates and deposit of natural soils.	sediment to lime is expected ater and CO32 CO32- form s on the sediment. Calcium	s CaCO3 by reacting with carbonate is of low		
Exposure concentrations in soil	Substance	PEC (mg/L)	PNEC (mg/L)	RCR		
and groundwater	CaCO3.MgO	632	1034	0.61		
Exposure concentration in atmospheric compartment	This point is not relevant. C 10 ⁻⁵ Pa.	Calcium magnesium carbona	ate oxide is not volatile. The	vapour pressures is below		
Exposure concentration relevant for the food chain (secondary poisoning)			sidered to be omnipresent ar uence the distribution of the			
Environmental exposure	for urban soil treatment					
The urban soil treatment scenario is based on a road border scenario. At the special road border technical meeting (Ispra, September 5, 2003), EU Member States and industry agreed on a definition for a "road technosphere". The road technosphere can be defined as "the engineered environment that carries the geotechnical functions of the road in connection with its structure, operation and maintenance including the installations to ensure road safety and manage run off. This technosphere, which includes the hard and soft shoulder at the edge of the carriageway, is vertically dictated by the groundwater watertable. The road authority has responsibility for this road technosphere including road safety, road support, prevention of pollution and water management". The road technosphere was therefore excluded as assessment endpoint for risk assessment for the purpose of the existing/new substances regulations. The target zone is the zone beyond the technosphere, to which the environmental risk assessment applies. The PEC calculation for soil was based on the FOCUS soil group (FOCUS, 1996) and on the "draft guidance on the calculation of predicted environmental concentration values (PEC) of plant protection products for soil, ground water, surface water and sediment (Kloskowksi et al., 1999). The FOCUS/EXPOSIT modelling tool is preferred to the EUSES as it is more appropriate for agricultural-like application as in this case where parameter as the drift needs to be included in the modelling. FOCUS is a model typically developed for biocidal applications and was further elaborated on the basis of the German EXPOSIT 1.0 model, where parameters such as drifts can be improved according to collected data.						
Environmental emissions	See amounts used					
Exposure	Not relevant for road borde	er scenario				

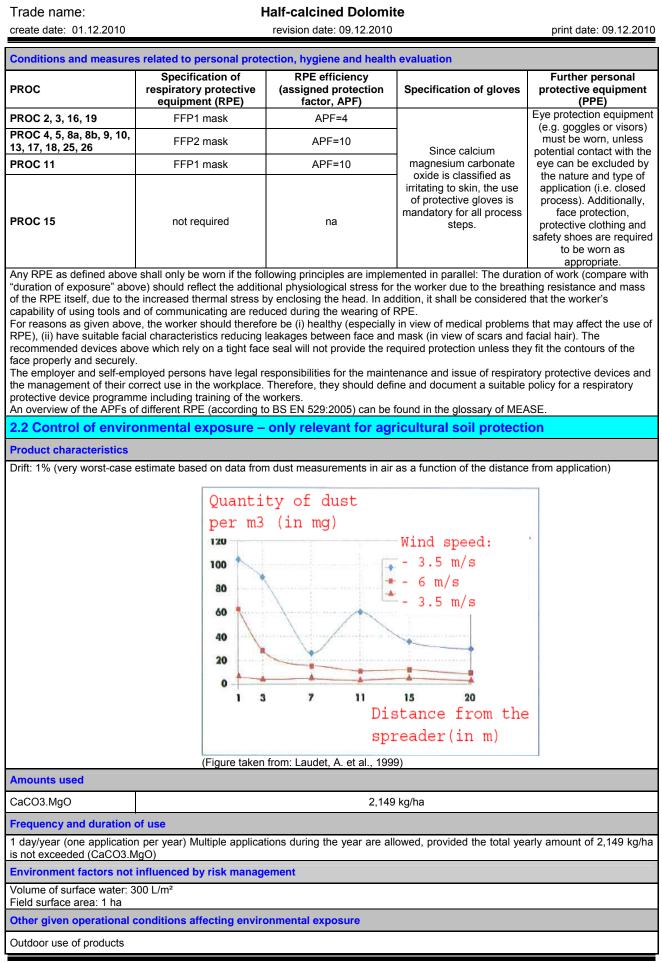
Trade name:	H	alf-calcined Dolomit	e		
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
concentration in waste water treatment plant (WWTP)					
Exposure concentration in aquatic pelagic compartment	Not relevant for road borde	r scenario			
Exposure concentration in sediments	Not relevant for road borde	r scenario			
Exposure concentrations in soil	Substance	PEC (mg/L)	PNEC (mg/L)	RCR	
and groundwater	CaCO3.MgO	671	1034	0.65	
Exposure concentration in atmospheric compartment	This point is not relevant. C 10 ⁻⁵ Pa.	Calcium magnesium carbona	ate oxide is not volatile. The v	vapour pressures is below	
Exposure concentration relevant for the food chain (secondary poisoning)			sidered to be omnipresent an luence the distribution of the		
Environmental exposure	for other uses				
 The operational protection or urb Lime is an ingre wastewater or si Lime is specifica compartment, w 	For all other uses, no quantitative environmental exposure assessment is carried because				
4. Guidance to DU to	o evaluate whether he	e works inside the bo	oundaries set by the E	IS	
The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below. If measured data are not available, the DU may make use of an appropriate scaling tool such as MEASE (<u>www.ebrc.de/mease.html</u>) to estimate the associated exposure. The dustiness of the substance used can be determined according to the MEASE glossary. For example, substances with a dustiness less than 2.5 % according to the Rotating Drum Method (RDM) are defined as "low dusty", substances with a dustiness less than 10 % (RDM) are defined as "medium dusty" and substances with a dustiness ≥10 % are defined as "high dusty".					
•	/m ³ (as respirable dust	,			
a level of 4 mg/m ³ . By dem therefore also covered (ac by a factor of 2). When usi	nonstrating a safe use when cording to R.14 guidance, a	comparing exposure estima cute exposure levels can be n of exposure estimates, it is	DNEL given above, a DNEL for ates with the long-term DNEL of derived by multiplying long-t is noted that the exposure dur ction of 40 %).	., the acute DNEL is term exposure estimates	

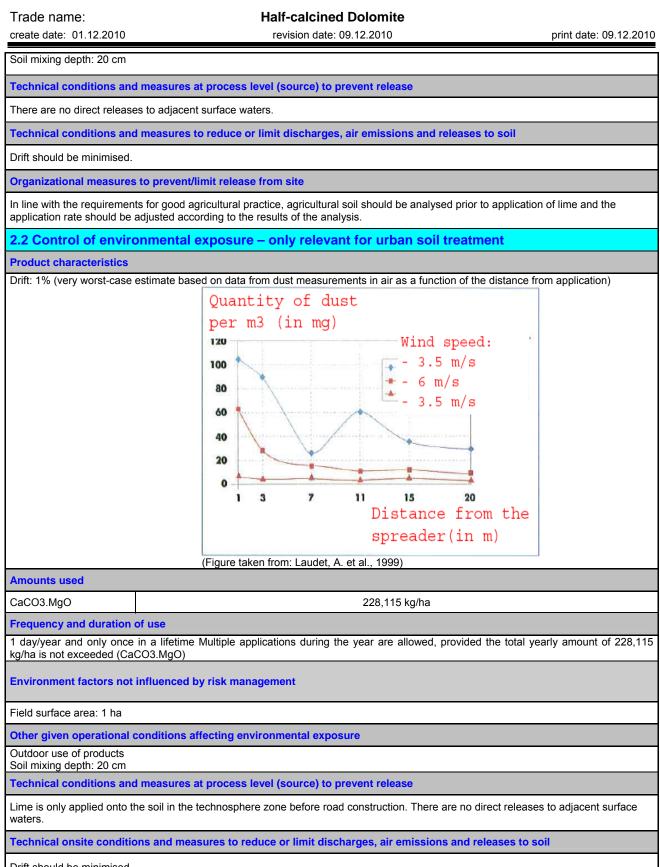
Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.8: Professional uses of medium dusty solids/powders of lime substances

Exposure Scenario	Format (1) addressing uses carried out by	y workers		
1. Title				
Free short title	Professional uses of medium dusty solids/powders of lime substances			
	SU22, SU1, SU5, SU6a, SU6b, SU7, SU10, SU11, SU12, SU13, SU16, SU17, SU18, SU19, SU20, SU23,			
Systematic title based on use descriptor	SU24 PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC36, PC37, PC39, PC40 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13			
		s are given in Section 2 below)		
Processes, tasks and/or activities covered	Processes, tasks and/or activities cove	ered are described in Section 2 below.		
Assessment Method	The assessment of inhalation exposure is base environmental assessment i	d on the exposure estimation tool MEASE. The s based on FOCUS-Exposit.		
2. Operational cond	itions and risk management measures			
PROC/ERC	REACH definition	Involved tasks		
PROC 2	Use in closed, continuous process with occasional controlled exposure			
PROC 3	Use in closed batch process (synthesis or formulation)			
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises			
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)			
PROC 8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities			
PROC 8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities			
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)			
PROC 10	Roller application or brushing	Further information is provided in the ECHA Guidance on information requirements and chemical		
PROC 11	Non industrial spraying	safety assessment, Chapter R.12: Use descriptor		
PROC 13	Treatment of articles by dipping and pouring	system (ECHA-2010-G-05-EN).		
PROC 15	Use as laboratory reagent			
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected			
PROC 17	Lubrication at high energy conditions and in partly open process			
PROC 18	Greasing at high energy conditions			
PROC 19	Hand-mixing with intimate contact and only PPE available			
PROC 25	Other hot work operations with metals			
PROC 26	Handling of solid inorganic substances at ambient temperature			
ERC2, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f	Wide dispersive indoor and outdoor use of reactive substances or processing aids in open systems			

Trade name: create date: 01.12.2010	H	Half-calcined Dolomit revision date: 09.12.2010	e	print date: 09.12.201
2.1 Control of worke	ers exposure			p
Product characteristic				
According to the MEASE a reflected by an assignmen temperature the fugacity is taking into account the pro-	t of a so-called fugacity class based on the dustiness of t	insic emission potential is or is in the MEASE tool. For op that substance. Whereas in l nelting point of the substance emission potential.	erations conducted with soli hot metal operations, fugaci	d substances at ambient ty is temperature based,
PROC	Use in preparation	Content in preparation	Physical form	Emission potential
PROC 25	not res	stricted	solid/powder, molten	high
All other applicable PROCs	not res	stricted	solid/powder	medium
Amounts used				
the scale of operation (ind		t to influence the exposure a level of containment/automa		
Frequency and duration	of use/exposure			
PROC		Duration o	f exposure	
PROC 11, 16, 17, 18, 19		≤ 240 n	ninutes	
All other applicable PROCs		480 minutes (not restricted)	
Human factors not influe	enced by risk management	t		
The shift breathing volume	e during all process steps ref	flected in the PROCs is assu	umed to be 10 m ³ /shift (8 ho	urs).
Other given operational	conditions affecting worke	ers exposure		
assessment in MEASE is I expected to vary within the process temperatures are Technical conditions and	however based on the ratio e industry the highest ratio w automatically covered in this d measures at process lev	teps with considerably high to of process temperature and vas taken as a worst case as s exposure scenario for PRC el (source) to prevent relea . containment or segregation	melting point. As the associ sumption for the exposure e DC 22, 23 and PROC 25. ase	ated temperatures are estimation. Thus all
•	d measures to control disp	persion from source toward	ds the worker	
PROC	Level of separation	Localised controls (LC)	Efficiency of LC (according to MEASE)	Further information
PROC 11, 16	Any potentially required separation of workers from the emission source	generic local exhaust ventilation	72 %	-
PROC 17, 18	is indicated above under "Frequency and duration	integrated local exhaust ventilation	87 %	-
PROC 19	of exposure". A reduction of exposure duration can be achieved, for	not applicable	na	-
All other applicable PROCs	example, by the installation of ventilated (positive pressure) control rooms or by removing the worker from workplaces involved with relevant exposure.	not required	na	-
Organisational measures	s to prevent /limit releases	, dispersion and exposure		
Avoid inhalation or ingestion measures involve good pe smoking at the workplace,	on. General occupational hy rsonal and housekeeping pr the wearing of standard wo	giene measures are required ractices (i.e. regular cleaning rking clothes and shoes unle I clothing at home. Do not bl	d to ensure a safe handling with suitable cleaning devices of wherwise stated below.	ces), no eating and Shower and change





Drift should be minimised.

Trade name:	Half-calcined Dolomite			
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010
3. Exposure estimat	tion and reference to	its source		
Occupational exposure				
quotient of the refined expuse. For inhalation exposu and the respective inhalati	ool MEASE was used for the osure estimate and the resp ure, the RCR is based on the on exposure estimate derive e fraction being a sub-fractio	ective DNEL (derived no-eff DNEL for calcium magnesi ed using MEASE (as inhalab	ect level) and has to be belo um carbonate oxide of 1 mg le dust). Thus, the RCR incl	ow 1 to demonstrate a safe g/m ³ (as respirable dust)
PROC	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)
PROC 2, 3, 4, 5, 8a, 8b, 9, 10, 11, 13, 15, 16, 17, 18, 19, 25, 26	MEASE	< 1 mg/m³ (0.25 – 0.825)	classified as irritating to sk be minimised as far as teo for dermal effects has r dermal exposure is not a	sium carbonate oxide is kin, dermal exposure has to chnically feasible. A DNEL not been derived. Thus, assessed in this exposure hario.
Environmental exposure	for agricultural soil protec	ction		
calculation of predicted en sediment (Kloskowksi et al agricultural-like application typically developed for bio parameters such as drifts of	bil and surface water was ba vironmental concentration va I., 1999). The FOCUS/EXPC as in this case where parar cidal applications and was fu can be improved according to bwards surface waters, via d	alues (PEC) of plant protecti DSIT modelling tool is preferin neter as the drift needs to be urther elaborated on the bas to collected data: once applie	ion products for soil, ground red to the EUSES as it is mo e included in the modelling. is of the German EXPOSIT	I water, surface water and ore appropriate for FOCUS is a model 1.0 model, where
Environmental emissions	See amounts used			
Exposure concentration in waste water treatment plant (WWTP)	Not relevant for agricultura	l soil protection		
Exposure concentration in	Substance	PEC (ug/L)	PNEC (ug/L)	RCR
aquatic pelagic compartment	CaCO3.MgO	7.16	470	0.015
Exposure concentration in sediments	waters the hydroxide ions r	posure of surface water nor react with HCO3- to form wa ate precipitates and deposits of natural soils.	ater and CO32 CO32- form s on the sediment. Calcium	ns CaCO3 by reacting with
Exposure concentrations in soil	Substance	PEC (mg/L)	PNEC (mg/L)	RCR
and groundwater	CaCO3.MgO	632	1034	0.61
Exposure concentration in atmospheric compartment	This point is not relevant. Calcium magnesium carbonate oxide is not volatile. The vapour pressures is below 10 ⁻⁵ Pa.			
Exposure concentration relevant for the food chain (secondary poisoning)	environment. The uses covered do not significantly influence the distribution of the constituents (Ca ⁻ and OH ⁻) in the environment			
Environmental exposure for urban soil treatment				
The urban soil treatment scenario is based on a road border scenario. At the special road border technical meeting (Ispra, September 5, 2003), EU Member States and industry agreed on a definition for a "road technosphere". The road technosphere can be defined as "the engineered environment that carries the geotechnical functions of the road in connection with its structure, operation and maintenance including the installations to ensure road safety and manage run off. This technosphere, which includes the hard and soft shoulder at the edge of the carriageway, is vertically dictated by the groundwater watertable. The road authority has responsibility for this road technosphere including road safety, road support, prevention of pollution and water management". The road technosphere was therefore excluded as assessment endpoint for risk assessment for the purpose of the existing/new substances regulations. The target zone is the zone beyond the technosphere, to which the environmental risk assessment applies.				
(Kloskowksi et al., 1999). The FOCUS/EXPOSIT modelling tool is preferred to the EUSES as it is more appropriate for agricultural-like application as in this case where parameter as the drift needs to be included in the modelling. FOCUS is a model typically developed for biocidal applications and was further elaborated on the basis of the German EXPOSIT 1.0 model, where parameters such as drifts can be improved according to collected data.				
Environmental emissions	See amounts used			

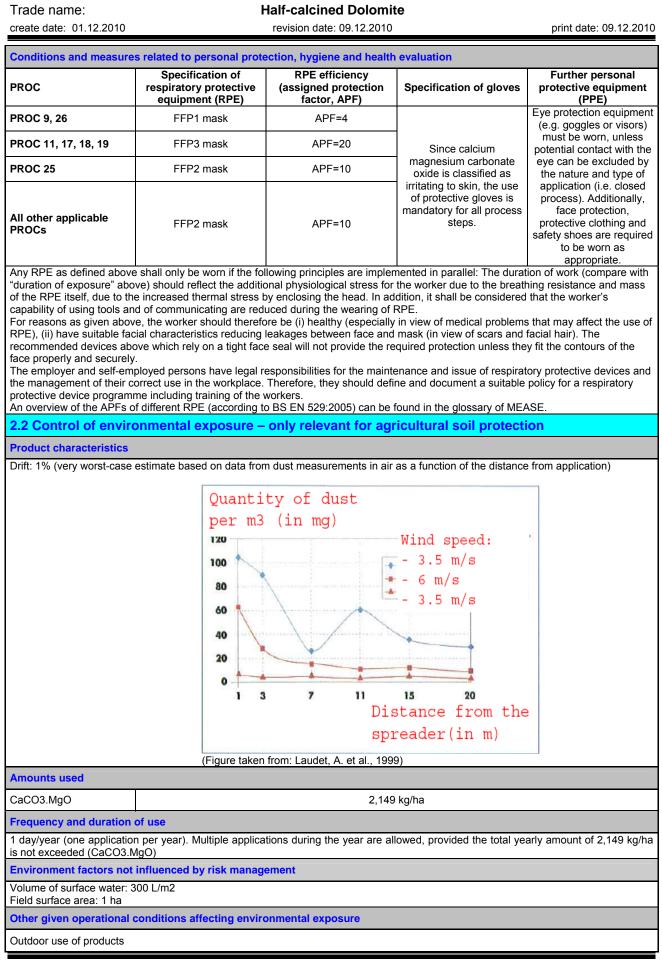
Trade name: create date: 01.12.2010	ŀ	Half-calcined Dolomit revision date: 09.12.2010	te	print date: 09.12.2010
Exposure concentration in waste water treatment plant (WWTP)	Not relevant for road border scenario			
Exposure concentration in aquatic pelagic compartment	Not relevant for road border scenario			
Exposure concentration in sediments	Not relevant for road borde	er scenario		
Exposure	Substance	PEC (mg/L)	PNEC (mg/L)	RCR
concentrations in soil and groundwater	CaCO3.MgO	671	1034	0.65
Exposure concentration in atmospheric compartment	This point is not relevant. Calcium magnesium carbonate oxide is not volatile. The vapour pressures is below 10 ⁻⁵ Pa.			
Exposure concentration relevant for the food chain (secondary poisoning)	This point is not relevant because calcium can be considered to be omnipresent and essential in the environment. The uses covered do not significantly influence the distribution of the constituents (Ca ²⁺ and OH) in the environment.			
Environmental exposure	for other uses			
 The operational protection or urb Lime is an ingre wastewater or si Lime is specifica compartment, w 	an soil treatment dient and chemically bound urface water Illy used to release CO2-free here the lime properties are	agement measures are le into a matrix. Releases ar e breathable air, upon reac exploited	because ss stringent than those out e negligible and insufficient t tion with CO2. Such applicati npacts beyond those desired.	o cause a pH-shift in soil, ions only relates to the air
4. Guidance to DU to	o evaluate whether h	e works inside the b	oundaries set by the E	S
downstream user can dem adequate. This has to be of (given that the processes a available, the DU may male exposure. The dustiness of dustiness less than 2.5 % than 10 % (RDM) are define DNEL _{inhalation} : 1 mg <u>Important note</u> : The DU has a level of 4 mg/m ³ . By dem therefore also covered (ac by a factor of 2). When usi	onstrate on his own that his lone by showing that they lin and activities in question are we use of an appropriate sca f the substance used can be according to the Rotating Dr hed as "medium dusty" and s /m ³ (as respirable dust to be aware of the fact that nonstrating a safe use when cording to R.14 guidance, ac	operational conditions and nit the inhalation and derma covered by the PROCs list ling tool such as MEASE (w determined according to the um Method (RDM) are define substances with a dustiness comparing exposure estima- cute exposure levels can be n of exposure estimates, it is	agement measures as descri implemented risk manageme al exposure to a level below th ted above) as given below. If <u>www.ebrc.de/mease.html</u>) to e the MEASE glossary. For exar ned as "low dusty", substance is ≥10 % are defined as "high of DNEL given above, a DNEL for ates with the long-term DNEL to derived by multiplying long-t is noted that the exposure dur	ent measures are ne respective DNEL measured data are not estimate the associated mple, substances with a es with a dustiness less dusty". or acute effects exists at t, the acute DNEL is term exposure estimates

Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

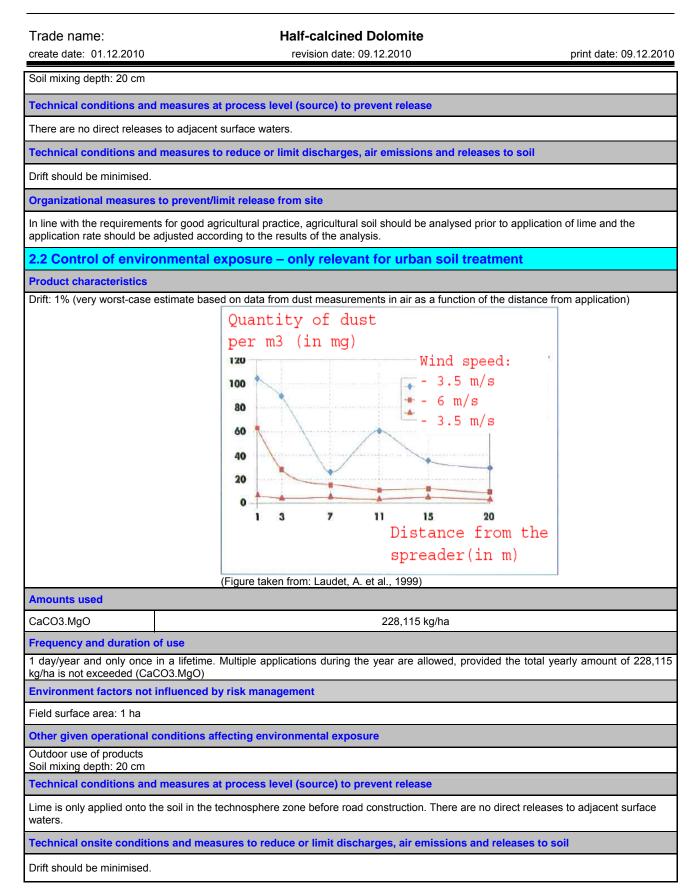
ES number 9.9: Professional uses of high dusty solids/powders of lime substances

Exposure Scenario	Format (1) addressing uses carried out by	y workers		
1. Title				
Free short title	Professional uses of high dusty solids/powders of lime substances			
	SU22, SU1, SU5, SU6a, SU6b, SU7, SU10, SU11, SU12, SU13, SU16, SU17, SU18, SU19, SU20, SU23			
Systematic title based on use descriptor	SU24 PC1, PC2, PC3, PC7, PC8, PC9a, PC9b, PC11, PC12, PC13, PC14, PC15, PC16, PC17, PC18, PC19, PC20, PC21, PC23, PC24, PC25, PC26, PC27, PC28, PC29, PC30, PC31, PC32, PC33, PC34, PC35, PC36, PC37, PC39, PC40 AC1, AC2, AC3, AC4, AC5, AC6, AC7, AC8, AC10, AC11, AC13 (appropriate PROCs and ERCs are given in Section 2 below)			
Processes, tasks and/or activities covered		ered are described in Section 2 below.		
Assessment Method		ed on the exposure estimation tool MEASE. The s based on FOCUS-Exposit.		
2. Operational cond	itions and risk management measures			
PROC/ERC	REACH definition	Involved tasks		
PROC 2	Use in closed, continuous process with occasional controlled exposure			
PROC 3	Use in closed batch process (synthesis or formulation)			
PROC 4	Use in batch and other process (synthesis) where opportunity for exposure arises			
PROC 5	Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)			
PROC 8a	Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities			
PROC 8b	Transfer of substance or preparation (charging/ discharging) from/to vessels/large containers at dedicated facilities			
PROC 9	Transfer of substance or preparation into small containers (dedicated filling line, including weighing)			
PROC 10	Roller application or brushing	Further information is provided in the ECHA Guidance on information requirements and chemical		
PROC 11	Non industrial spraying	safety assessment, Chapter R.12: Use descriptor		
PROC 13	Treatment of articles by dipping and pouring	system (ECHA-2010-G-05-EN).		
PROC 15	Use as laboratory reagent			
PROC 16	Using material as fuel sources, limited exposure to unburned product to be expected			
PROC 17	Lubrication at high energy conditions and in partly open process			
PROC 18	Greasing at high energy conditions			
PROC 19	Hand-mixing with intimate contact and only PPE available			
PROC 25	Other hot work operations with metals			
PROC 26	Handling of solid inorganic substances at ambient temperature			
ERC2, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f	Wide dispersive indoor and outdoor use of reactive substances or processing aids in open systems			

Trade name: create date: 01.12.2010	F	Half-calcined Dolomit revision date: 09.12.2010	e	print date: 09.12.20	
				print date. 09.12.20	
2.1 Control of worke	ers exposure				
Product characteristic					
reflected by an assignmen temperature the fugacity is taking into account the pro	t of a so-called fugacity clas based on the dustiness of t	insic emission potential is or s in the MEASE tool. For op hat substance. Whereas in I telting point of the substance emission potential.	erations conducted with soli hot metal operations, fugaci	id substances at ambient ty is temperature based,	
PROC	Use in preparation	Content in preparation	Physical form	Emission potential	
All applicable PROCs	not restricted solid/powder high				
Amounts used	-		•		
the scale of operation (indu		to influence the exposure a level of containment/automa			
Frequency and duration	of use/exposure				
PROC		Duration o	f exposure		
PROC 4, 5, 8a, 8b, 9, 10, 16, 17, 18, 19, 26	≤ 240 minutes				
PROC 11		≤ 60 minutes			
All other applicable PROCs	480 minutes (not restricted)				
Human factors not influe	nced by risk management	:			
The shift breathing volume	during all process steps ref	lected in the PROCs is assu	umed to be 10 m ³ /shift (8 ho	urs).	
Other given operational of	conditions affecting worke	ers exposure			
assessment of the conduct assessment in MEASE is h expected to vary within the	ted processes. In process st nowever based on the ratio of industry the highest ratio w	rocess pressure are not con eps with considerably high to f process temperature and as taken as a worst case as as exposure scenario for PRC	temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e	, 23, 25), the exposure ated temperatures are	
Technical conditions and	d measures at process lev	el (source) to prevent relea	ase		
Risk management measur the processes.	es at the process level (e.g.	containment or segregation	of the emission source) are	e generally not required i	
Technical conditions and	d measures to control disp	ersion from source towar	ds the worker		
PROC	Level of separation	Localised controls (LC)	Efficiency of LC (according to MEASE)	Further information	
PROC 4, 5, 8a, 8b, 9, 11, 16, 26	Any potentially required separation of workers from the emission source	generic local exhaust ventilation	72 %	-	
PROC 17, 18	is indicated above under "Frequency and duration	integrated local exhaust ventilation	87 %	-	
PROC 19	of exposure". A reduction of exposure duration can be achieved, for	not applicable	na	only in well ventilated rooms or outdoors (efficiency 50 %)	
All other applicable PROCs	example, by the installation of ventilated (positive pressure) control rooms or by removing the worker from workplaces involved with relevant exposure.	not required	na	-	
Organisational measures	to prevent /limit releases	, dispersion and exposure	•		
measures involve good pe smoking at the workplace,	rsonal and housekeeping pr the wearing of standard wo	giene measures are required actices (i.e. regular cleaning rking clothes and shoes unle clothing at home. Do not bl	y with suitable cleaning devices otherwise stated below.	ces), no eating and Shower and change	



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Trade name:	Half-calcined Dolomite			
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010
	tion and reference to	its source		
Occupational exposure				
quotient of the refined expo use. For inhalation exposu and the respective inhalation	ool MEASE was used for the osure estimate and the resp ure, the RCR is based on the ion exposure estimate derive e fraction being a sub-fractio	ective DNEL (derived no-eff DNEL for calcium magnesi ed using MEASE (as inhalab	fect level) and has to be belo ium carbonate oxide of 1 mg ble dust). Thus, the RCR incl	ow 1 to demonstrate a safe g/m ³ (as respirable dust)
PROC	Method used for inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)
PROC 2, 3, 4, 5, 8a, 8b, 9, 10, 11, 13, 15, 16, 17, 18, 19, 25, 26	MEASE	<1 mg/m³ (0.5 – 0.825)	classified as irritating to ski be minimised as far as teo for dermal effects has r	ium carbonate oxide is in, dermal exposure has to chnically feasible. A DNEL not been derived. Thus, issessed in this exposure nario.
	e for agricultural soil protec			
calculation of predicted en sediment (Kloskowksi et al agricultural-like application typically developed for bio parameters such as drifts of	bil and surface water was bas nvironmental concentration va II., 1999). The FOCUS/EXPC In as in this case where paran cidal applications and was fu can be improved according to powards surface waters, via du	alues (PEC) of plant protecti DSIT modelling tool is prefer neter as the drift needs to bu urther elaborated on the bas to collected data: once appli	ion products for soil, ground red to the EUSES as it is mo e included in the modelling. sis of the German EXPOSIT	water, surface water and ore appropriate for FOCUS is a model 1.0 model, where
Environmental emissions	See amounts used			
Exposure concentration in waste water treatment plant (WWTP)	Not relevant for agricultura	l soil protection		
Exposure concentration in	Substance	PEC (ug/L)	PNEC (ug/L)	RCR
aquatic pelagic compartment	CaCO3.MgO	7.16	470	0.015
Exposure concentration in sediments	As described above, no exposure of surface water nor sediment to lime is expected. Further, in natural waters the hydroxide ions react with HCO3- to form water and CO32 CO32- forms CaCO3 by reacting with Ca2+. The calcium carbonate precipitates and deposits on the sediment. Calcium carbonate is of low solubility and a constituent of natural soils.			
Exposure concentrations in soil	Substance	PEC (mg/L)	PNEC (mg/L)	RCR
and groundwater Exposure concentration in atmospheric compartment	CaCO3.MgO 632 1034 0.61 This point is not relevant. Calcium magnesium carbonate oxide is not volatile. The vapour pressures is below 10 ⁻⁵ Pa. 10 ⁻⁵ Pa.			
Exposure concentration relevant for the food chain (secondary poisoning)	entration relevant e food chain $O(T)$ in the environment. The uses covered do not significantly influence the distribution of the constituents (Ca ²⁺ and O(T)) in the environment			
Environmental exposure for urban soil treatment				
The urban soil treatment scenario is based on a road border scenario. At the special road border technical meeting (Ispra, September 5, 2003), EU Member States and industry agreed on a definition for a "road technosphere". The road technosphere can be defined as "the engineered environment that carries the geotechnical functions of the road in connection with its structure, operation and maintenance including the installations to ensure road safety and manage run off. This technosphere, which includes the hard and soft shoulder at the edge of the carriageway, is vertically dictated by the groundwater watertable. The road authority has responsibility for this road technosphere including road safety, road support, prevention of pollution and water management". The road technosphere was therefore excluded as assessment endpoint for risk assessment for the purpose of the existing/new substances regulations. The target zone is the zone beyond the technosphere, to which the environmental risk assessment applies.				
predicted environmental concentration values (PEC) of plant protection products for soil, ground water, surface water and sediment (Kloskowksi et al., 1999). The FOCUS/EXPOSIT modelling tool is preferred to the EUSES as it is more appropriate for agricultural-like application as in this case where parameter as the drift needs to be included in the modelling. FOCUS is a model typically developed for biocidal applications and was further elaborated on the basis of the German EXPOSIT 1.0 model, where parameters such as drifts can be improved according to collected data.				
Environmental emissions	See amounts used			

Trade name: create date: 01.12.2010	ŀ	lalf-calcined Dolomit revision date: 09.12.2010	e	print date: 09.12.2010
Exposure concentration in waste water treatment plant (WWTP)	Not relevant for road border scenario			
Exposure concentration in aquatic pelagic compartment	Not relevant for road border scenario			
Exposure concentration in sediments	Not relevant for road borde	r scenario		
Exposure	Substance	PEC (mg/L)	PNEC (mg/L)	RCR
concentrations in soil and groundwater	CaCO3.MgO	671	1034	0.65
Exposure concentration in atmospheric compartment	This point is not relevant. Calcium magnesium carbonate oxide is not volatile. The vapour pressures is below 10 ⁻⁵ Pa.			
Exposure concentration relevant for the food chain (secondary poisoning)			idered to be omnipresent and uence the distribution of the o	
Environmental exposure	for other uses			
 The operational protection or urb Lime is an ingre wastewater or st Lime is specifica compartment, with the statement of the statement of	conditions and risk mana an soil treatment dient and chemically bound urface water Illy used to release CO2-free here the lime properties are	into a matrix. Releases are e breathable air, upon reacti exploited	pecause is stringent than those out e negligible and insufficient to ion with CO2. Such application upacts beyond those desired.	o cause a pH-shift in soil,
			oundaries set by the E	S
The DU works inside the b downstream user can dem adequate. This has to be d (given that the processes a available, the DU may mak exposure. The dustiness o dustiness less than 2.5 % i than 10 % (RDM) are defin DNEL _{inhalation} : 1 mg, <u>Important note</u> : The DU ha a level of 4 mg/m ³ . By dem therefore also covered (acc by a factor of 2). When usi	oundaries set by the ES if e onstrate on his own that his lone by showing that they lin and activities in question are ke use of an appropriate sca f the substance used can be according to the Rotating Dr led as "medium dusty" and s /m ³ (as respirable dust is to be aware of the fact that ionstrating a safe use when cording to R.14 guidance, are ng MEASE for the derivatior	ther the proposed risk mana operational conditions and i nit the inhalation and dermal covered by the PROCs liste ling tool such as MEASE (<u>w</u> e determined according to th um Method (RDM) are defin substances with a dustiness) t apart from the long-term D comparing exposure estima cute exposure levels can be	agement measures as descril implemented risk manageme I exposure to a level below th ed above) as given below. If r <u>ww.ebrc.de/mease.html</u>) to e e MEASE glossary. For exan led as "low dusty", substance ≥10 % are defined as "high c PNEL given above, a DNEL fo tes with the long-term DNEL, derived by multiplying long-te noted that the exposure dura	bed above are met or the nt measures are he respective DNEL measured data are not estimate the associated nple, substances with a he with a dustiness less dusty". or acute effects exists at t, the acute DNEL is erm exposure estimates

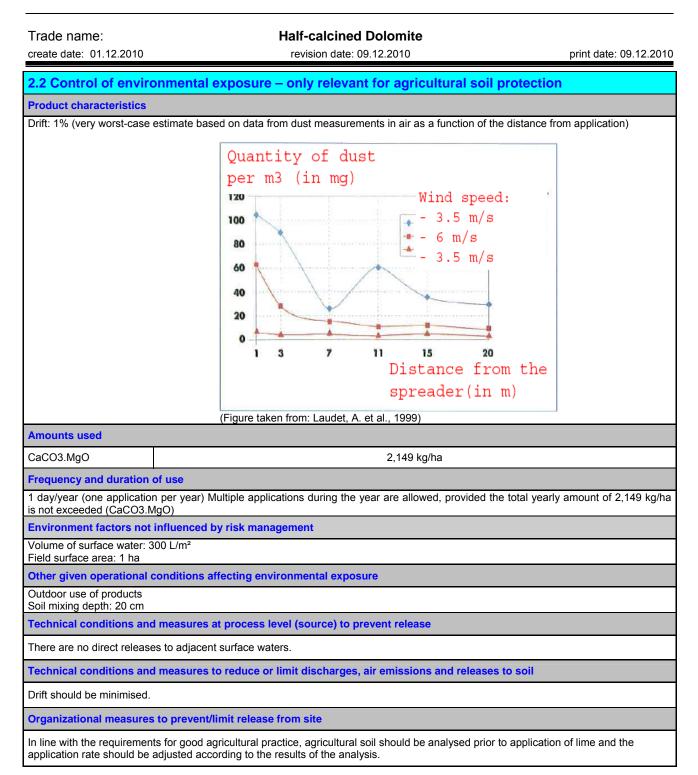
Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

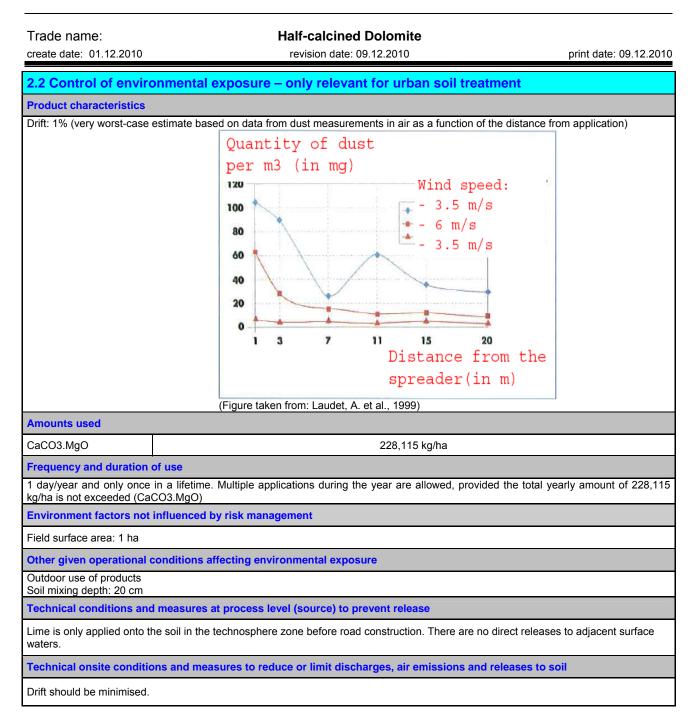
ES number 9.10: Professional use of lime substances in soil treatment

Exposure Scenario	Format (1) addressing uses carried out b	v workers				
1. Title	<u> </u>	,				
Free short title	Professional use of lime s	ubstances in soil treatment				
Systematic title based	SU22					
on use descriptor Processes, tasks	(appropriate PROCs and ERC	s are given in Section 2 bein	ow)			
and/or activities covered	Processes, tasks and/or activities covered are described in Section 2 below.					
Assessment Method	The assessment of inhalation exposure is based on ME/ ME/ The environmental assessmer	ASE.				
2. Operational cond	itions and risk management measures					
Task/ERC	REACH definition	Involve	d tasks			
Milling	PROC 5					
Loading of spreader	PROC 8b, PROC 26		of calcium magnesium for soil treatment.			
Application to soil (spreading)	PROC 11		ior son treatment.			
ERC2, ERC8a, ERC8b, ERC8c, ERC8d, ERC8e, ERC8f	Wide dispersive indoor and outdoor use of reactive substances or processing aids in open systems	numerous cases of v agricultural, forestry, fish	bonate oxide is applied in vide dispersive uses: and shrimps farming, soil conmental protection.			
2.1 Control of worke	ers exposure					
Product characteristic						
temperature the fugacity is taking into account the pro the level of abrasion instea	t of a so-called fugacity class in the MEASE tool. For op based on the dustiness of that substance. Whereas in cess temperature and the melting point of the substanc d of the substance intrinsic emission potential.	hot metal operations, fugaci e. As a third group, high abr	ty is temperature based, asive tasks are based on			
Task	Use in preparation Content in preparation	Physical form	Emission potential			
Milling	not restricted	solid/powder	high			
Loading of spreader Application to soil	not restricted	solid/powder	high			
(spreading)	not restricted	solid/powder	high			
Amounts used						
the scale of operation (indu	d per shift is not considered to influence the exposure a istrial vs. professional) and level of containment/automa intrinsic emission potential.					
Frequency and duration	of use/exposure					
Task	Duration o	of exposure				
Milling	240 m	ninutes				
Loading of spreader	240 minutes					
Application to soil (spreading)	480 minutes (not restricted)					
Human factors not influe	nced by risk management					
The shift breathing volume	during all process steps reflected in the PROCs is assu	umed to be 10 m ³ /shift (8 ho	urs).			
· · · ·	conditions affecting workers exposure					
Operational conditions (e.g assessment of the conduct	 process temperature and process pressure) are not c and processes. 	onsidered relevant for occup	pational exposure			
	I measures at process level (source) to prevent rele	ase				
Risk management measure the processes.	es at the process level (e.g. containment or segregation	n of the emission source) are	e generally not required in			

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Technical conditions on	d measures to control disp	persion from source tower	ds the worker	
Task	Level of separation	Localised controls (LC)	Efficiency of LC	Further information
Milling	Separation of workers is	not required	na	
5	generally not required in the conducted	•		-
Loading of spreader	processes.	not required	na	-
Application to soil (spreading)	During application the worker is sitting in the cabin of the spreader	Cabin with filtered air supply	99%	-
Organisational measure	s to prevent /limit releases	, dispersion and exposure	•	
clothes at end of work shi	the wearing of standard work t. Do not wear contaminated s related to personal prote	clothing at home. Do not bl	ow dust off with compressed	Shower and change d air.
	Specification of	RPE efficiency		Further personal
Task	respiratory protective equipment (RPE)	(assigned protection factor, APF)	Specification of gloves	protective equipment (PPE)
Milling	FFP3 mask	APF=20	Since calcium	Eye protection equipmer (e.g. goggles or visors) must be worn, unless potential contact with the
Loading of spreader	FFP3 mask	APF=20	magnesium carbonate oxide is classified as irritating to skin, the use of protective gloves is mandatory for all process	eye can be excluded by the nature and type of application (i.e. closed process). Additionally, face protection,
Application to soil (spreading)	not required	na	steps.	protective clothing and safety shoes are required to be worn as appropriate.
"duration of exposure" abo of the RPE itself, due to th capability of using tools an For reasons as given abo RPE), (ii) have suitable fa recommended devices ab face properly and securely The employer and self-en the management of their of protective device program	e shall only be worn if the fol ove) should reflect the addition in increased thermal stress be and of communicating are redu- ve, the worker should therefor cial characteristics reducing ove which rely on a tight face y. apployed persons have legal re- correct use in the workplace. the including training of the yor of different RPE (according to	onal physiological stress for by enclosing the head. In add uced during the wearing of F ore be (i) healthy (especially leakages between face and e seal will not provide the re- esponsibilities for the mainte Therefore, they should defir workers.	the worker due to the breath dition, it shall be considered RPE. in view of medical problems mask (in view of scars and quired protection unless the enance and issue of respirat he and document a suitable	hing resistance and mass that the worker's s that may affect the use of facial hair). The y fit the contours of the ory protective devices and policy for a respiratory





Trade name:	ŀ	alf-calcined Dolomit	e					
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010				
3. Exposure estimat	tion and reference to	its source						
Occupational exposure								
characterisation ratio (RCF	R) is the quotient of the refin ate a safe use. For inhalation	ed exposure estimate and th	essment of inhalation exposine respective DNEL (derived ed on the DNEL for calcium in the DNEL for calcium integration integra	no-effect level) and has				
Task	Method used for inhalation exposure assessment	inhalation exposure estimate (PCR) Method used for dermal Dermal exposure						
Milling	MEASE	0.488 mg/m³ (0.48)	Since calcium magnesi classified as irritating to ski					
Loading of spreader	MEASE (PROC 8b)	0.488 mg/m ³ (0.48)	be minimised as far as tec	hnically feasible. A DNEL				
Application to soil (spreading)	measured data	0.880 mg/m³ (0.88)	for dermal effects has n dermal exposure is not as scen	ssessed in this exposure				
Environmental exposure	for agricultural soil protect	ction						
sediment (Kloskowksi et al agricultural-like application typically developed for bioo parameters such as drifts of	 I., 1999). The FOCUS/EXPC as in this case where parar cidal applications and was full 	DSIT modelling tool is prefer neter as the drift needs to bu urther elaborated on the bas to collected data: once appli	ion products for soil, ground red to the EUSES as it is mo e included in the modelling. I is of the German EXPOSIT ed on the soil, calcium magn	re appropriate for FOCUS is a model 1.0 model, where				
concentration in waste water treatment plant (WWTP)	Not relevant for agricultura	l soil protection						
Exposure concentration in	Substance	PEC (ug/L)	PNEC (ug/L)	RCR				
aquatic pelagic compartment	CaCO3.MgO	7.16	470	0.015				
Exposure concentration in sediments	waters the hydroxide ions i	react with HCO3- to form wa ate precipitates and deposit	sediment to lime is expected ater and CO32 CO32- forms s on the sediment. Calcium of	s CaCO3 by reacting with				
Exposure	Substance	PEC (mg/L)	PNEC (mg/L)	RCR				
concentrations in soil and groundwater	CaCO3.MgO	632	1034	0.61				
Exposure concentration in atmospheric compartment	This point is not relevant. (10 ⁻⁵ Pa.	Calcium magnesium carbona	ate oxide is not volatile. The	vapour pressures is below				
Exposure concentration relevant for the food chain (secondary poisoning)	This point is not relevant because calcium can be considered to be omnipresent and essential in the environment. The uses covered do not significantly influence the distribution of the constituents (Ca ²⁺ and OH) in the environment.							
Environmental exposure	for urban soil treatment							
2003), EU Member States engineered environment the including the installations tedge of the carriageway, is technosphere including roat therefore excluded as assest zone is the zone beyond the	and industry agreed on a de nat carries the geotechnical is o ensure road safety and ma s vertically dictated by the gr ad safety, road support, prev essment endpoint for risk as ne technosphere, to which th	efinition for a "road technosp functions of the road in con- anage run off. This technosp oundwater watertable. The vention of pollution and wate sessment for the purpose of the environmental risk assess		re can be defined as "the ration and maintenance rd and soft shoulder at the illity for this road chnosphere was s regulations. The target				
predicted environmental co (Kloskowksi et al., 1999). T application as in this case	oncentration values (PEC) o The FOCUS/EXPOSIT mode where parameter as the drif vas further elaborated on the	f plant protection products for elling tool is preferred to the t needs to be included in the	and on the "draft guidance o or soil, ground water, surface EUSES as it is more approp e modelling. FOCUS is a mod OSIT 1.0 model, where param	water and sediment riate for agricultural-like del typically developed for				
Environmental emissions	See amounts used							
Exposure concentration in waste	Not relevant for road borde	er scenario						

Trade name:	H	alf-calcined Dolomit	e		
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010	
water treatment plant (WWTP)					
Exposure concentration in aquatic pelagic compartment	Not relevant for road borde	r scenario			
Exposure concentration in sediments	Not relevant for road borde	er scenario			
Exposure concentrations in soil	Substance	PEC (mg/L)	PNEC (mg/L)	RCR	
and groundwater	CaCO3.MgO	671	1034	0.65	
Exposure concentration in atmospheric compartment	This point is not relevant. C 10 ⁻⁵ Pa.	Calcium magnesium carbona	te oxide is not volatile. The	vapour pressures is below	
Exposure concentration relevant for the food chain (secondary poisoning)	environment. The uses covered do not significantly influence the distribution of the constituents (Ca ⁻ and OH ⁻) in the environment				
Environmental exposure	for other uses				
 For all other uses, no quantitative environmental exposure assessment is carried because The operational conditions and risk management measures are less stringent than those outlined for agricultural soil protection or urban soil treatment Lime is an ingredient and chemically bound into a matrix. Releases are negligible and insufficient to cause a pH-shift in soil, wastewater or surface water Lime is specifically used to release CO2-free breathable air, upon reaction with CO2. Such applications only relates to the air compartment, where the lime properties are exploited Neutralisation/pH-shift is the intended use and there are no additional impacts beyond those desired. 					
4. Guidance to DU to	o evaluate whether h	e works inside the bo	undaries set by the	ES	
The DU works inside the boundaries set by the ES if either the proposed risk management measures as described above are met or the downstream user can demonstrate on his own that his operational conditions and implemented risk management measures are adequate. This has to be done by showing that they limit the inhalation and dermal exposure to a level below the respective DNEL (given that the processes and activities in question are covered by the PROCs listed above) as given below. If measured data are not available, the DU may make use of an appropriate scaling tool such as MEASE (<u>www.ebrc.de/mease.html</u>) to estimate the associated exposure. The dustiness of the substance used can be determined according to the MEASE glossary. For example, substances with a dustiness less than 2.5 % according to the Rotating Drum Method (RDM) are defined as "low dusty", substances with a dustiness less than 10 % (RDM) are defined as "medium dusty" and substances with a dustiness ≥10 % are defined as "high dusty".					
•	/m ³ (as respirable dust as to be aware of the fact that) It apart from the long-term D	NEL given above, a DNEL	for acute effects exists at	
a level of 4 mg/m ³ . By dem therefore also covered (ac by a factor of 2). When usi	nonstrating a safe use when cording to R.14 guidance, a ng MEASE for the derivatior	comparing exposure estima cute exposure levels can be n of exposure estimates, it is eading to an exposure reduc	tes with the long-term DNEI derived by multiplying long- noted that the exposure du	L, the acute DNEL is -term exposure estimates	

Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.11: Professional uses of articles/containers containing lime substances

1. Title							
Free short title	Profe	ssional uses of articles/cont	ainers containing lime subst	ances			
			U12, SU13, SU16, SU17, S				
Systematic title based on use descriptor		J24 5, AC7, AC8, AC10, AC11, A s are given in Section 2 belo					
Processes, tasks and/or activities covered	Processes, tasks and/or activities covered are described in Section 2 below.						
Assessment Method	The assessment	of inhalation exposure is ba	sed on the exposure estima	tion tool MEASE.			
2. Operational cond	itions and risk mana	gement measures					
PROC/ERC	REACH	definition	Involve	d tasks			
PROC 0	(PROC 21 (low emissio	process n potential) as proxy for estimation)	Use of containers contain carbonate oxide/prepara (e.g. breathin	tions as CO ₂ absorbents			
PROC 21		n of substances bound in nd/or articles	Handling of substances b artic				
PROC 24	High (mechanical) energ		Grinding, mec				
PROC 25	Other hot work ope	erations with metals	Welding, soldering				
ERC10, ERC11, ERC 12		nd outdoor use of long-life als with low release	Calcium magnesium carbonate oxide bound into or onto articles and materials such as: wooden and plastic construction and building materials (e.g. gutters, drains), flooring, furniture, toys, leather products, paper and cardboard products (magazines, books, news paper and packaging paper), electronic equipment (casing)				
2.1 Control of worke	ers exposure						
Product characteristic							
reflected by an assignment temperature the fugacity is taking into account the pro	t of a so-called fugacity clas based on the dustiness of t	s in the MEASE tool. For op hat substance. Whereas in helting point of the substance	ne of the main exposure det perations conducted with soli hot metal operations, fugaci e. As a third group, high abra	d substances at ambient ty is temperature based,			
PROC	Use in preparation	Content in preparation	Physical form	Emission potential			
PROC 0	not res	stricted	massive objects (pellets), low potential for dust formation due to abrasion during previous filling and handling activities of pellets, not during use of breathing apparatus	low (worst case assumption as no inhalation exposure is assumed during the use of the breathing apparatus du to the very low abrasive potential)			
PROC 21	not res	stricted	massive objects	very low			
PROC 24, 25	not res	stricted	massive objects	high			
Amounts used			· · · · · · · · · · · · · · · · · · ·				
	strial vs. professional) and	level of containment/automa	as such for this scenario. Ins ation (as reflected in the PR				

Trade name:	ŀ	alf-calcined Dolomit	e	
create date: 01.12.2010		revision date: 09.12.2010		print date: 09.12.2010
Frequency and duration	of use/exposure			
PROC		Duration o	f exposure	
PROC 0		occupational exposure to ca	inutes Icium magnesium carbonate user instructions of the actua	
PROC 21	0		not restricted)	<u> </u>
PROC 24, 25		≤ 240 r	ninutes	
Human factors not influe	nced by risk management	:		
The shift breathing volume	e during all process steps ref	lected in the PROCs is assu	umed to be 10 m ³ /shift (8 ho	urs).
Other given operational	conditions affecting worke	ers exposure		
assessment of the conduc assessment in MEASE is h expected to vary within the	process temperature and p ted processes. In process st nowever based on the ratio o industry the highest ratio w automatically covered in this	teps with considerably high to of process temperature and as taken as a worst case as	temperatures (i.e. PROC 22 melting point. As the associ ssumption for the exposure e	, 23, 25), the exposure ated temperatures are
Technical conditions and	d measures at process lev	el (source) to prevent rele	ase	
Risk management measur the processes.	es at the process level (e.g.	containment or segregation	of the emission source) are	e generally not required in
•	d measures to control disp	ersion from source towar	ds the worker	
PROC	Level of separation	Localised controls (LC)	Efficiency of LC (according to MEASE)	Further information
PROC 0	Any potentially required separation of workers from the emission source is indicated above under	not required	na	-
PROC 21	"Frequency and duration of exposure". A reduction of exposure duration can	not required	na	-
PROC 24, 25	be achieved, for example, by the installation of ventilated (positive pressure) control rooms or by removing the worker from workplaces involved with relevant exposure.	not required	na	-
Organisational measures	s to prevent /limit releases	, dispersion and exposure	•	
measures involve good pe smoking at the workplace,	on. General occupational hyperia rsonal and housekeeping pre- the wearing of standard work t. Do not wear contaminated	actices (i.e. regular cleaning rking clothes and shoes unle	g with suitable cleaning devi	ces), no eating and Shower and change
Conditions and measure	s related to personal prote	ection, hygiene and health	evaluation	
PROC	Specification of respiratory protective equipment (RPE)	RPE efficiency (assigned protection factor, APF)	Specification of gloves	Further personal protective equipment (PPE)
PROC 0, 21	not required	na		Eye protection equipment (e.g. goggles or visors) must be worn, unless
PROC 24, 25	FFP1 mask	APF=4	Since calcium magnesium carbonate oxide is considered as irritating to skin, the use of protective gloves is mandatory for all process steps.	potential contact with the eye can be excluded by the nature and type of application (i.e. closed process). Additionally, face protection, protective clothing and safety shoes are required to be worn as appropriate.
"duration of exposure" abo of the RPE itself, due to th capability of using tools an	e shall only be worn if the fol ve) should reflect the addition e increased thermal stress b d of communicating are redu- re, the worker should therefor	onal physiological stress for by enclosing the head. In ad uced during the wearing of F	the worker due to the breath dition, it shall be considered RPE.	ion of work (compare with hing resistance and mass that the worker's

Trade name: create date: 01.12.2010		te	print date: 09.12.201	
recommended devices abc face properly and securely. The employer and self-emp the management of their co protective device programmer	ove which rely on a tight face bloyed persons have legal re prrect use in the workplace. ne including training of the v	e seal will not provide the re esponsibilities for the mainte Therefore, they should defi vorkers.	mask (in view of scars and fa equired protection unless they enance and issue of respirato ne and document a suitable p found in the glossary of MEA:	fit the contours of the ory protective devices and policy for a respiratory
2.2 Control of enviro				
Product characteristics				
Lime is chemically bound in	nto/onto a matrix with very lo	ow release potential		
3. Exposure estimat	ion and reference to	its source		
Occupational exposure				
quotient of the refined expo use. For inhalation exposu- and the respective inhalatio	osure estimate and the resp re, the RCR is based on the	ective DNEL (derived no-ef DNEL for calcium magnes d using MEASE (as inhalat	exposure. The risk characteris fect level) and has to be belo ium carbonate oxide of 1 mg/ ole dust). Thus, the RCR inclu iccording to EN 481.	w 1 to demonstrate a sat m³ (as respirable dust)
PROC	inhalation exposure assessment	Inhalation exposure estimate (RCR)	Method used for dermal exposure assessment	Dermal exposure estimate (RCR)
PROC 0	MEASE (PROC 21)	0.5 mg/m³ (0.5)	Since calcium magnesi	
PROC 21	MEASE	0.05 mg/m³ (0.05)	considered as irritating to s to be minimised as far as	kin, dermal exposure ha technically feasible. A
PROC 24	MEASE	0.825 mg/m³ (0.825)	DNEL for dermal effects ha dermal exposure is not as	
PROC 25	MEASE	0.6 mg/m³ (0.6)	scena	
Environmental exposure				
			ended release of lime during pH-shift in soil, wastewater o	
			oundaries set by the E	
downstream user can dem adequate. This has to be d (given that the processes a available, the DU may mak exposure. The dustiness of dustiness less than 2.5 % a than 10 % (RDM) are defin DNEL _{inhalation} : 1 mg/	onstrate on his own that his one by showing that they lin and activities in question are the use of an appropriate sca f the substance used can be according to the Rotating Dr led as "medium dusty" and s /m ³ (as respirable dust	operational conditions and nit the inhalation and derma covered by the PROCs list ling tool such as MEASE (w e determined according to th um Method (RDM) are defin substances with a dustiness)	agement measures as descri implemented risk manageme al exposure to a level below th ted above) as given below. If <u>www.ebrc.de/mease.html</u>) to e ne MEASE glossary. For exar ned as "low dusty", substance s ≥10 % are defined as "high of DNEL given above, a DNEL for	ent measures are the respective DNEL measured data are not estimate the associated mple, substances with a es with a dustiness less dusty".
a level of 4 mg/m ³ . By dem	onstrating a safe use when cording to R.14 guidance, a	comparing exposure estima cute exposure levels can be	ates with the long-term DNEL e derived by multiplying long-t s noted that the exposure dur	, the acute DNEL is erm exposure estimates

Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.12: Consumer use of building and construction material (DIY – do it yourself)

Exposure Scenario F	ormat (2	2) addres	ssing us	es carried ou	t by con	sumers				
1. Title										
Free short title				Consumer use of building and construction material						
Systematic title based o	n use de	scriptor		SU21, PC9a, PC9b, ERC8c, ERC8d, ERC8e, ERC8f						
Processes, tasks activities covered				Handling (mixin Application of li				IS		
Assessment Method*			Human health: A qualitative as	sessment re to the e el (van He	t has been eye. Inhalati emmen, 199	performed for ion exposure to 92).		and dermal exposure as st has been assessed by		
2. Operational conc	litions	and ris	(mana							
RMM				ed risk managen		sures are in	place			
PC/ERC		Description categorie	on of act	ivity referring to	article c	ategories	(AC) and envi	ironr	nental release	
PC 9a, 9b		Mixing and Application Post-appli	d loading n of lime cation ex		slurry to th	ne walls or o	ceiling.			
ERC 8c, 8d, 8e, 8f Wide dispersive ou Wide dispersive ou Wide dispersive ou			ersive ou ersive ou	tdoor use of proc	essing ai	ds in open : tances in op	systems oen systems			
2.1 Control of cons	umers	exposu	re							
Product characteristic										
Description of the preparation		ntration o		Physical state preparation	of the	Dustines	s (if relevant))	Packaging design	
	prepar	ation		• •						
Lime substance	100 %			Solid, powder			dium and low,		Bulk in bags of up to	
Plaster, Mortar	20-40%)-40%		Solid, powder		depending on the kind of lime substance (indicative value from DIY ¹ fact sheet see section 9.0.3)		ive	35 kg.	
Plaster, Mortar	20-40%	/ 0		Pasty		-		-		
Putty, filler	30-55%	0		Pasty, highly vi thick liquid	scous,	-			In tubes or buckets	
Pre-mixed lime wash paint	~30%	30%		Solid, powder		High - low (indicative value from DIY fact sheet see section 9.0.3)		0IY ¹	Bulk in bags of up to 35 kg.	
Lime wash paint/milk of lime preparation	~ 30 %			Milk of lime preparation		-			-	
Amounts used										
Description of the prepa	ration	Amoun	t used pe	er event						
Filler, putty		250 g –	1 kg pow to determ	der (2:1 powder		is heavily d	ependent on t	he de	epth and size of the holes	
Plaster/lime wash paint				g on the size of t	the room.	wall to be t	reated.			
Floor/wall equalizer				g on the size of t						
Frequency and duration	of use/e			-	,		·			
Description of task				n of exposure p			frequency of	of eve	ents	
Mixing and loading of lime powder.	containi	ng	1.33 mi	n (DIY ¹ -fact shee ixing and loading	et, RIVM, (Chapter	2/year (DIY ¹ fact sheet)			
Application of lime plaster to the walls or ceiling	, putty or	slurry		minutes - hours	•		2/year (DIY ¹	fact	sheet)	
Human factors not influe	enced by	<mark>/ risk</mark> mar	agemen	t						
Description of the task		ation expo		Breathing rate	•	Exposed	body part		Corresponding skin area [cm²]	
Handling of powder	Adult			1.25 m³/hr		Half of bo	oth hands		430 (DIY ¹ fact sheet)	
Application of liquid, pasty lime preparations.	Adult	an all and		NR		Hands an	id forearms		1900 (DIY ¹ fact sheet)	
Other given operational	conditio					alum -		A '		
Description of the task			r/outdoo	ſ	Room v		00.0mc#		exchange rate	
Handling of powder		indoor				ersonal spa ound the us		0.6	hr ⁻¹ (unspecified room)	

Dolomitwerk Jettenberg Schöndorfer GmbH

Trade name:		Half-calcined Dolomite					
create date: 01.12.20	10	rev	vision date: 09.12.2010	print date: 09.12.2010			
Application of liquid, pa	asty lime	indoor	NR	NR			
preparations.		to information and b	al automatica da la computera				
Londitions and measure	a damage DIV	ors should comply with	ehavioural advice to consumers h the same strict protective measures whi	ch apply to professional workplaces:			
				ch apply to professional workplaces.			
-	•	es and gloves immedia	•				
			e): there are various effective skin protect				
		protection plan (skin p	rotection, cleansing and care). Cleanse th	e skin thoroughly after the work and			
apply a care		to more an all must a stic	an and burging				
Conditions and meas	domogo DIV	to personal protection	h the same strict protective measures whi	ah apply to professional workplaces:			
			ring demolition or caulking and, above all,				
		as face masks during		during overnead work, wear			
	00	0	ecome wet and can facilitate burns. When	working in a wet environment			
			etter. Wear gauntlet gloves during overhea				
			ch permeates the working clothes.				
2.2 Control of en	vironmenta	al exposure					
Product characterist	ics						
Not relevant for expos	ure assessme	nt					
Amounts used*							
Not relevant for expos	ure assessme	nt					
Frequency and durat	ion of use						
Not relevant for expos							
Environment factors		d by risk manageme	nt				
Default river flow and o							
Other given operatio	nal condition	s affecting environm	ental exposure				
Indoor Direct discharge to the	waatawataria	avaidad					
Direct discharge to the Conditions and measure			treatment plant				
			nd sludge treatment technique				
			it of waste for disposal				
Not relevant for expos							
Conditions and meas			of waste				
Not relevant for expos							
3. Exposure estin	nation and	reference to its	source				
			refined exposure estimate and the respec	tive DNEL (derived no-effect level)			
and is given in parenth	ieses below. É	or inhalation exposure	e, the RCR is based on the acute DNEL fo	or lime substances of 4 mg/m ³ (as			
respirable dust) and th	e respective ir	nhalation exposure est	timate (as inhalable dust). Thus, the RCR				
			le fraction according to EN 481.				
	ied as irritating	յ to skin and eyes a qւ	ualitative assessment has been performed	for dermal exposure and exposure			
to the eye. Human exposure							
Handling of powder							
Route of exposure	Exposure e	stimate	Method used, comments				
Oral	-	otimato	Qualitative assessment				
0101			Oral exposure does not occur as p	part of the intended product use.			
Dermal	small task: ().1 µg/cm² (-)	Qualitative assessment				
	large task: 1		If risk reduction measures are take	en into account no human exposure			
	-		is expected. However, dermal con				
			substances or direct contact to the				
			protective gloves are worn during				
			result in mild irritation easily avoid	ed by prompt rinsing with water.			
			Quantitative assessment	when here been used. The contest			
			The constant rate model of ConsE rate to dust formed while pouring				
			DIY ¹ -fact sheet (RIVM report 3201				
Eye	Dust		Qualitative assessment	<u></u>			
,				en into account no human exposure			
			is expected. Dust from loading of t				
			excluded if no protective goggles a	are used. Prompt rinsing with water			
	ļ		and seeking medical advice after a	accidental exposure is advisable.			
Inhalation		12 µg/m³ (0.003)	Quantitative assessment				
	Large task:	120 µg/m³ (0.03)	Dust formation while pouring the p				
			dutch model (van Hemmen, 1992,	as described in section 9.0.3.1			
Application of limited	nactu lime	roparations	above).				
Application of liquid, Route of exposure	Exposure e		Method used, comments				
Oral	-	Samuto	Qualitative assessment				
			Oral exposure does not occur as p	part of the intended product use.			
L							

Trade name: create date: 01.12	.2010	Half-calcined Dolomite revision date: 09.12.2010	print date: 09.12.2010
Dermal	Splashes	is expected. However, splashes o protective gloves are worn during	en into account no human exposure in the skin cannot be excluded if no the application. Splashes may n easily avoided by immediate rinsing
Eye	Splashes	expected. However, splashes into	
Inhalation	-	Qualitative assessment Not expected, as the vapour pres generation of mists or aerosols do	
Post-application No relevant expositions from the atmosphere	ure will be assumed as the aq	ueous lime preparation will quickly convert to calciu	Im carbonate with carbon dioxide
Environmental ex			
Referring to the OC the influent of a mu influent of a munic acid wastewater st	Z/RMMs related to the enviror unicipal wastewater treatment ipal wastewater treatment plar reams that are treated in biolo	ment to avoid discharging lime solutions directly in plant is circum-neutral and therefore, there is no ex nt is often neutralized anyway and lime may even b ogical WWTPs. Since the pH of the influent of the m ing environmental compartments, such as surface	xposure to the biological activity. The e used beneficially for pH control of nunicipal treatment plant is circum

Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.13: Consumer use of CO2 absorbent in breathing apparatuses

Exposure Scenario Fo	ormat (2)	addres	sing us	es carried out	by con	sumers			
1. Title									
Free short title				Consumer use	of CO ₂ ab	sorbent in	breathing app	aratu	ses
Systematic title based or	n use des	criptor		SU21, PC2 , ERC8b					
Processes, tasks activit	ies covere	ed .		Filling of the for	mulation				
				Use of closed c	ircuit brea				
				Cleaning of equ					
Assessment Method*				Human health					
									and dermal exposure. The
					sure has l	been asses	ssed by the Du	utch n	nodel (van Hemmen,
				1992).					
		Environment							
				A qualitative jus	tification	assessmer	nt is provided.		
2. Operational cor	ditions	sand	risk m				•		
RMM							a defined ar	ount	of water (14-18%) is
									oreathing cycle calcium
	di	ihvdroxid	e will be	quickly reacting v	vith CO ₂ t	o form the	carbonate		reating cycle calcium
PC/ERC		escrintio	on of act	ivity referring to	article c	ategories	(AC) and env	ironn	nental release
· V/LIV		ategorie		inty islaning to		210901105			
PC 2				t breathing appa	ratus for e	e.g. recreat	tional diving co	ontain	ing soda lime as CO ₂
									ickly react (catalysed by
									nate. The CO ₂ -free air
	Ca	an be re-	breathed	again, after addi	tion of ox	ygen.			
							led after each	use a	and refilled before each
		ive.							
ERC 8b	N	/ide disp	ersive ind	oor use resulting	in inclus	ion into or (onto a matrix		
2.1 Control of con	sumers	s expo	sure						
Product characteristic									
Description of the	Concent	tration o	f the	Physical state	of the	Dustines	ss (if relevant)	Packaging design
preparation	substan			preparation			,	,	
•••	prepara								
CO ₂ absorbent	78 - 84%	Ď		Solid, granular		Very low	dustiness		4.5, 18 kg canister
	Dependi			-		(reductio	ction by 10 %		-
	application						d to powder)		
	compone		ifferent				nation cannot		
	additives						during the filling		
	A specifi					of the sci	ubber cartridg	je.	
	water is		uaea						
"Used" CO ₂ absorbent	(14-18%) ~ 20%).		Colid gropular Van Jour duati		ductinoss		1.3 kg in broothing	
Useu CO2 absorbent	~ 20%			Solid, granular		Very low dustiness (reduction by 10 %			1-3 kg in breathing apparatus
						compared to powder)			apparatus
Amounts used	l					compare			
CO ₂ -Absorbent used in bre	eathing an	paratus		1-3 kg dependir	na on the	kind of bre	athing appara	tus	
Frequency and duration				. o ng dopondi	.g on the				
Description of the task			Duratio	n of exposure p	er event		frequency	of eve	ents
Filling of the formulation in	to the cart	ridge		3 min per filling, i		5 min			
Use of closed circuit breat			1-2 h				Up to 4 dive		
Cleaning and emptying of	0 1 1		< 15 mi	n			After each dive (up to 4 times)		
Human factors not influe									
Description of the task	Populati			Breathing rate		Exposed	body part	1	Corresponding skin
									area [cm ²]
Filling of the formulation	adult			1.25 m³/hr (ligh	t	hands			840
into the cartridge				working activity)					(REACH guidance R.15,
ç				Norming country,				men)	
Use of closed circuit	Use of closed circuit					-			-
breathing apparatus	Į								
Cleaning and emptying						hands			840
of equipment									(REACH guidance R.15,
									men)
Other given operational	condition								-
Description of the task			r/outdoo	r	Room v	/olume			exchange rate
Filling of the formulation in	to the	NR			NR			NR	
cartridge									

Trade name:		Half-	-calcined Dolomite	
create date: 01.12.20	10	revi	ision date: 09.12.2010	print date: 09.12.2010
Use of closed circuit b	reathing	-	-	-
apparatus		ND	ND	
Cleaning and emptying equipment	g of	NR	NR	NR
1.1	sures related t	o information and be	havioural advice to consumers	
Do not get in eyes, on	skin, or on clot	thing. Do not breathe d	lust	
Keep container tightly Keep out of reach of c		oid the soda lime to di	ry out.	
Wash thoroughly after				
		mediately with plenty of	of water and seek medical advice.	
Do not mix with acids.	wetiene of the			
Conditions and measured	sures related t	o personal protection	assure a proper use of the breathin	ig apparatus.
			handling. Use a filtering half mask	(mask type FFP2 acc. to EN 149).
2.2 Control of e				
Product characterist				
Not relevant for expos	ure assessmer	nt		
Amounts used*				
Not relevant for expos		it		
Frequency and durat Not relevant for expos				
Environment factors			nt	
Default river flow and	dilution			
Other given operatio	nal conditions	affecting environme	ental exposure	
Indoor				
Conditions and mease Default size of municir			nd sludge treatment technique	
			of waste for disposal	
Not relevant for expos				
Conditions and meas			of waste	
Not relevant for expos	-		ite sourco	
				espective DNEL (derived no-effect level)
				IEL for lime substances of 4 mg/m ³ (as
respirable dust) and th	le respective in	halation exposure esti	mate (as inhalable dust). Thus, the	RCR includes an additional safety margin
			e fraction according to EN 481.	s been performed for dermal exposure
and exposure to the ev		as initiating to skin, and	d eyes a qualitative assessment has	been penormed for dermar exposure
Due to the very specia	lised kind of co	onsumers (divers filling	their own CO ₂ scrubber) it can be a	assumed that instructions will be taken
into account to reduce	exposure			
Human exposure Filling of the formula	tion into the c	artridge		
Route of exposure			Method used, comments	
Oral	-		Qualitative assessment	
Dermal	-		Qualitative assessment	r as part of the intended product use.
Dermai	-			e taken into account no human exposure
			is expected. However, derma	I contact to dust from loading of granular
				the granules cannot be excluded if no
				ring application. This may occasionally avoided by prompt rinsing with water.
Eye	Dust		Qualitative assessment	
				e taken into account no human exposure
				g of the granular soda lime is expected to osure will be minimal even without
				ess, prompt rinsing with water and
	ļ		seeking medical advice after	accidental exposure is advisable.
Inhalation		l.2 μg/m³ (3 × 10 ⁻⁴)	Quantitative assessment	the neuder is oddeesed by using the
	Large task: 7	12 μg/m³ (0.003)		the powder is addressed by using the 1992, as described in section 9.0.3.1
				eduction factor of 10 for the granular form.
Use of closed circuit				
Route of exposure	Exposure e	stimate	Method used, comments	
Oral	-		Qualitative assessment Oral exposure does not occur	r as part of the intended product use.
Dermal	-		Qualitative assessment	
				stics, it can be concluded that dermal
			exposure to the absorbent in	breathing apparatuses is non-existent.

		print date: 09.12.201
-	Qualitative assessment Due to the product characteristics	
		athing apparatuses is non-existent.
negligible	Instructional advice is provided to assembly of the scrubber. Divers represent a specific subpopulation equipment and materials is in the assumed that instructions will be Due to the product characteristics	n within consumers. Proper use of ir own interest; hence it can be taken into account. and the instructional advices given, n exposure to the absorbent during
ying of equipment		
Exposure estimate	Method used, comments	
-	Qualitative assessment Oral exposure does not occur as	part of the intended product use.
Dust and splashes	is expected. However, dermal cor soda lime or direct contact to the protective gloves are worn during cleaning of the cartridge with wate may occur. This may occasionally by immediate rinsing of with wate	ten into account no human exposure ntact to dust from emptying granular granules cannot be excluded if no cleaning. Furthermore, during the er contact to moistened soda lime y result in mild irritation easily avoided r.
Dust and splashes	is expected. However, contact to limes or during the cleaning of the	very rare occasions. Prompt rinsing
Small task: 0.3 μg/m³ (7.5 × 10 ⁻⁵) Large task: 3 μg/m³ (7.5 × 10 ⁻⁴)	Dutch model (van Hemmen, 1992	tion factor of 10 for the granular form
	2010 re negligible ying of equipment Exposure estimate - Dust and splashes Dust and splashes Small task: 0.3 µg/m³ (7.5 × 10 ⁻⁵)	- Qualitative assessment Due to the product characteristics exposure to the absorbent in breat exposure to the absorbent in breat Qualitative assessment Instructional advice is provided to assembly of the scrubber. Divers represent a specific subpopulatio equipment and materials is in the assumed that instructions will be Due to the product characteristics it can be concluded that inhalatio the use of the breathing apparatu ying of equipment Method used, comments Exposure estimate Method used, comments - Qualitative assessment If risk reduction measures are tak is expected. However, dermal consoda lime or direct contact to the protective gloves are worn during cleaning of the cartridge with wat may occur. This may occasionally by immediate rinsing of with watemay occur in with water and seeking medical a advisable. Dust and splashes Qualitative assessment If risk reduction measures are tak is expected. However, contact to the protective gloves are worn during cleaning of the cartridge with wat may occur. This may occasionally by immediate rinsing of with water and seeking medical a advisable. Small task: 0.3 µg/m³ (7.5 × 10 ⁻⁵) Qualitative assessment Large task: 3 µg/m³ (7.5 × 10 ⁻⁵) Quantitative assessment

The pH impact due to use of lime in breathing apparatuses is expected to be negligible. The influent of a municipal wastewater treatment plant is often neutralized anyway and lime may even be used beneficially for pH control of acid wastewater streams that are treated in biological WWTPs. Since the pH of the influent of the municipal treatment plant is circum neutral, the pH impact is negligible on the receiving environmental compartments, such as surface water, sediment and terrestrial compartment.

Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.14: Consumer use of garden lime/fertilizer

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Exposure Scenario F	ormat (2) addre	ssing u	ses carried ou	t by cor	nsumers			
1. Title									
Free short title				Consumer use of garden lime/fertilizer					
Systematic title based o	on use de	escriptor		SU21, PC20, PC12, ERC8e					
Processes, tasks activi	ties cov	ered		Manual applica	tion of ga	rden lime, f	ertilizer		
				Post-application					
Assessment Method*			Human health						
				A qualitative as	sessmen	t has been	performed fo	r oral and dermal exposu	ure as
								osure has been assesse	
				Dutch model (v					
		Environment							
		A qualitative just	stification	assessmer	nt is provided				
2. Operational cond	ditions	and ris	k mana						
RMM				ted risk manager		sures are ir	nlace		
PC/ERC								vironmental release ca	tegories
1 G/ERG		(ERC)		avity referring to		bategones			licgonics
PC 20			oreading	of the garden lim	e by sho	vel/hand (w	orst case) an	d soil incorporation.	
1020				posure to playing					
PC 12							(orst case) a	nd soil incorporation.	
1 0 12				posure to playing					
ERC 8e				itdoor use of read			nen systems		
							poir bysterils		
2.1 Control of cons	umers	exposi	ire						
Product characteristic			6.41		6.4				
Description of the		ntration o		Physical state	of the	Dustines	s (if relevan	t) Packaging desig	gn
preparation		ance in th	е	preparation					
O and any line a	prepar	ration		O all'al la successione		L Parla ale ca 4		Dull in here an	
Garden lime	100 %			Solid, powder		High dust	У	Bulk in bags or co	
								of 5, 10 and 25 kg	
Fertilizer	Up to 2	20 %		Solid, granular		Low dusty	/	Bulk in bags or co	
								of 5, 10 and 25 kg	g
Amounts used									
Description of the prepa	aration			Amount used per event				e of information	
Garden lime				100g /m ² (up to 200g/m ²)				ation and direction of use	
Fertilizer				100g /m ² (up to	100g /m ² (up to 1kg/m ² (compost)) Information and direction of use)
Frequency and duration	of use/e	exposure	r				-		
Description of the task				on of exposure per event frequency of events					
Manual application				es-hours			1 tasks per	year	
				ding on the size o					
Post-application				ddlers playing on grass (EPA		PA	Relevant fo	or up to 7 days after appli	ication
				re factors handbook)					
Human factors not influ						T			
Description of the	Popula	ation exp	osed	Breathing rate		Exposed	body part	Corresponding	skin
task							area [cm ²]		
Manual application	Adult			1.25 m³/hr			d forearms 1900 (DIY fact sheet)		
Post-application		oddlers		NR		NR		NR	
Other given operational	conditio	ons affect	ing con	sumers exposu	-				
Description of the task		Indoo	or/outdoor			Room volume		Air exchange rate	
Manual application		outdo	or		1 m³ (pe	1 m³ (personal space, small		NR	
						ound the us	er)		
Post-application		outdo			NR			NR	
Conditions and measure									
Do not get in eyes, on ski								P2 acc. to EN 149).	
Keep container closed an					0	,		,	
In case of contact with ey				lenty of water an	d seek m	edical advid	e.		
Wash thoroughly after ha				-					
		add limes	to water	and not water to	limes.				
Do not mix with acids and	always					na will facili	tate the effec	t.	
		r fertilizer i	nio the s	oli with subseque					
Incorporation of the garde	en lime o					ing this factor			
Incorporation of the garde	en lime or es relate	d to pers	onal prot	tection and hygi					
Incorporation of the garde Conditions and measure Wear suitable gloves, goo	en lime or es relate ggles and	d to persol protectio	onal prot n clothes	tection and hygi					
Incorporation of the garde Conditions and measure Wear suitable gloves, gog 2.2 Control of envir	en lime or es relate ggles and	d to persol protectio	onal prot n clothes	tection and hygi					
Incorporation of the garde Conditions and measure Wear suitable gloves, gog 2.2 Control of envir Product characteristics	en lime or es relate ggles and conmer	d to person protection ntal exp	onal prot n clothes osure	tection and hygi	ene				
Incorporation of the garde Conditions and measure Wear suitable gloves, gog 2.2 Control of envir Product characteristics Drift: 1 % (very worst-case	en lime or es relate ggles and conmer	d to person protection ntal exp	onal prot n clothes osure	tection and hygi	ene)
Incorporation of the garde Conditions and measure Wear suitable gloves, goo 2.2 Control of envir Product characteristics Drift: 1 % (very worst-case Amounts used	en limé or es relate ggles and conmer e estimate	d to person d protection ntal exp e based of	onal prot n clothes osure	tection and hygi	ene	air as a fund	ction of the d	istance from application)	
Incorporation of the garde Conditions and measure Wear suitable gloves, gog 2.2 Control of envir Product characteristics Drift: 1 % (very worst-case	en lime or es relate ggles and conmer	d to person d protection ntal exp e based of	onal prot n clothes osure	tection and hygi	ene	air as a fund	ction of the d		

Trade name:		Half-calcined Dolomite	
create date: 01.12.201	0	revision date: 09.12.2010	print date: 09.12.201
	CaO	1,700 kg/ha	
	CaO.MgO	1,478 kg/ha	
	Ca(OH)2.Mg(OH)2	2,030 kg/ha	
	CaCO3.MgO	2,149 kg/ha	
	Ca(OH)2.MgO	1,774 kg/ha	
Frequency and duration	Natural hydraulic lime	2,420 kg/ha	
		ations during the year are allowed, provided th	ne total yearly amount of 2 149 kg/ha
not exceeded (CaCO3.			
Environment factors n	ot influenced by risk mana	gement	
Not relevant for exposur			
	al conditions affecting envi	ironmental exposure	
Outdoor use of products			
Soil mixing depth: 20 cn			
	and measures at process te ases to adjacent surface wat	evel (source) to prevent release	
		limit discharges, air emissions and release	es to soil
Drift should be minimise		disertarges, un enholens and release	
	ures related to municipal se	ewage treatment plant	
Not relevant for exposu	ire assessment		
		atment of waste for disposal	
Not relevant for exposu			
	ures related to external rec	covery of waste	
Not relevant for exposu			
	nation and reference t	of the refined exposure estimate and the response	
		of the inhalable fraction according to EN 481.	en performed for dermal exposure
margin since the respira Since lime substances and exposure to the eye Human exposure	are classified as irritating to s	of the inhalable fraction according to EN 481. skin and eyes a qualitative assessment has be	en performed for dermal exposure
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application	are classified as irritating to s e.	skin and eyes a qualitative assessment has be	en performed for dermal exposure
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure	are classified as irritating to s	skin and eyes a qualitative assessment has be Method used, comments	en performed for dermal exposure
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application	are classified as irritating to s e.	skin and eyes a qualitative assessment has be Method used, comments Qualitative assessment	
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure	are classified as irritating to s e.	skin and eyes a qualitative assessment has be Method used, comments	
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure Oral	are classified as irritating to s e. Exposure estimate	Method used, comments Qualitative assessment Oral exposure does not occur as Qualitative assessment In the second s	part of the intended product use.
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure Oral	are classified as irritating to s e. Exposure estimate	Method used, comments Qualitative assessment Oral exposure does not occur as Qualitative assessment If risk reduction measures are tak is expected. However, dermal compared to the second comment	part of the intended product use. ken into account no human exposure ntact to dust from application of lime
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure Oral	are classified as irritating to s e. Exposure estimate	Method used, comments Qualitative assessment Oral exposure does not occur as Qualitative assessment If risk reduction measures are tak is expected. However, dermal consubstances or by direct contact to	part of the intended product use. ken into account no human exposure ntact to dust from application of lime o the limes cannot be excluded if no
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure Oral	are classified as irritating to s e. Exposure estimate	Method used, comments Qualitative assessment Oral exposure does not occur as Qualitative assessment If risk reduction measures are tak is expected. However, dermal con substances or by direct contact to protective gloves are worn during	part of the intended product use. the into account no human exposure ntact to dust from application of lime the limes cannot be excluded if no application. Due to the relatively long
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margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure Oral Dermal Eye Inhalation (garden lime)	are classified as irritating to s e. Exposure estimate - Dust, powder Dust Small task: 12 µg/m³ (0.001 Large task: 120 µg/m³ (0.01	Method used, comments Qualitative assessment Oral exposure does not occur as Qualitative assessment If risk reduction measures are tak is expected. However, dermal col substances or by direct contact to protective gloves are worn during application time, skin irritation wo avoided by immediate rinsing with consumers who had experience of themselves. Therefore, any occur reversible, can be assumed to be Qualitative assessment If risk reduction measures are tak is expected. Dust from surfacing of protective goggles are used. Pror medical advice after accidental er 2) Quantitative assessment If risk reduction measures are tak is expected. Dust from surfacing of protective goggles are used. Pror medical advice after accidental er 2) Quantitative assessment 2) No model describing the applicati available, therefore, read-across pouring powders has been used a Dust formation while pouring the dutch model (van Hemmen, 1992 above). * 10 ⁴) Quantitative assessment 24) No model describing the applicati available, therefore, read across pouring powders has been used and available, therefore, read across	part of the intended product use. the into account no human exposure intact to dust from application of lime to the limes cannot be excluded if no application. Due to the relatively long uld be expected. This can easily be the water. It would be assumed that of skin irritation will protect rring skin irritation, which will be e non-recurring. the into account no human exposure with lime cannot be excluded if no mpt rinsing with water and seeking xposure is advisable. tion of powders by shovel/hand is from the dust formation model while as a worst case. powder is addressed by using the 2, as described in section 9.0.3.1 tion of powders by shovel/hand is from the dust formation model while
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure Oral Dermal Eye Inhalation (garden lime)	are classified as irritating to s e. Exposure estimate - Dust, powder Dust Small task: 12 µg/m³ (0.001 Large task: 120 µg/m³ (0.01	Method used, comments Qualitative assessment Oral exposure does not occur as Qualitative assessment If risk reduction measures are tak is expected. However, dermal con- substances or by direct contact to protective gloves are worn during application time, skin irritation wo avoided by immediate rinsing with consumers who had experience of themselves. Therefore, any occur reversible, can be assumed to be Qualitative assessment If risk reduction measures are tak is expected. Dust from surfacing protective goggles are used. Pror medical advice after accidental er 2) Quantitative assessment If risk reduction measures are tak is expected. Dust from surfacing in protective goggles are used. Pror medical advice after accidental er 2) Quantitative assessment 2) Quantitative assessment No model describing the applicati available, therefore, read-across pouring powders has been used and Dust formation while pouring the dutch model (van Hemmen, 1992 above). * 10 ⁻⁴) Quantitative assessment 24) No model describing the applicati available, therefore, read across in pouring powders has been used and Dust formation while pouring the dutch model (van Hemmen, 1992	part of the intended product use. the into account no human exposure intact to dust from application of lime to the limes cannot be excluded if no application. Due to the relatively long uld be expected. This can easily be in water. It would be assumed that of skin irritation will protect rring skin irritation, which will be a non-recurring. The into account no human exposure with lime cannot be excluded if no mpt rinsing with water and seeking xposure is advisable. The dust formation model while as a worst case. powder is addressed by using the 2, as described in section 9.0.3.1 tion of powders by shovel/hand is from the dust formation model while as a worst case. powder is addressed by using the 2, as described in section 9.0.3.1
margin since the respira Since lime substances and exposure to the eye Human exposure Manual application Route of exposure Oral Dermal Eye Inhalation (garden lime)	are classified as irritating to s e. Exposure estimate - Dust, powder Dust Small task: 12 µg/m³ (0.001 Large task: 120 µg/m³ (0.01	Method used, comments Qualitative assessment Oral exposure does not occur as Qualitative assessment If risk reduction measures are tak is expected. However, dermal con- substances or by direct contact to protective gloves are worn during application time, skin irritation wo avoided by immediate rinsing with consumers who had experience of themselves. Therefore, any occur reversible, can be assumed to be Qualitative assessment If risk reduction measures are tak is expected. Dust from surfacing protective goggles are used. Pror medical advice after accidental er 2) Quantitative assessment If risk reduction measures are tak is expected. Dust from surfacing in protective goggles are used. Pror medical advice after accidental er 2) Quantitative assessment 2) Quantitative assessment X No model describing the applicati available, therefore, read-across pouring powders has been used and Dust formation while pouring the dutch model (van Hemmen, 1992) above). * 10 ⁻⁴) Quantitative assessment 24) No model describing the applicati available, therefore, read across is pouring powders has been used and Dust formation while pouring the dutch model (van Hemmen, 1992) above) and applying a dust reduction	part of the intended product use. the into account no human exposure ntact to dust from application of lime to the limes cannot be excluded if no papplication. Due to the relatively long uld be expected. This can easily be th water. It would be assumed that of skin irritation will protect rring skin irritation, which will be e non-recurring. the into account no human exposure with lime cannot be excluded if no mpt rinsing with water and seeking xposure is advisable. tion of powders by shovel/hand is from the dust formation model while as a worst case. powder is addressed by using the 2, as described in section 9.0.3.1 tion of powders by shovel/hand is from the dust formation model while as a worst case. powder is addressed by using the as a worst case. powder is addressed by using the

Trade name:	Half-calcined Dolomite					
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010				
According to the PSD (UK Pesticide Safety Directorate, now called CRD) post-application exposure need to be addressed for products which are applied in parks or amateur products used to treat lawns and plants grown in private gardens. In this case exposure of children, who may have access to these areas soon after treatment, needs to be assessed. The US EPA model predicts the post-application exposure to products used in private gardens (e.g. lawns) by toddlers crawling on the treated area and also via the oral route through hand-to-mouth activities.						
0	is used to treat acidic soil. Therefore, after application to the will be quickly neutralized. Exposure to lime substances will	1 0				
Environmental exposure						

No quantitative environmental exposure assessment is carried out because the operational conditions and risk management measures for consumer use are less stringent than those outlined for professional agricultural soil protection. Moreover, the neutralisation/pH-effect is the intended and desired effect in the soil compartment. Releases to wastewater are not expected.

Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.15: Consumer use of lime substances as water treatment chemicals

				by con	sumers			
			Consumer use	of lime su	bstances a	s water treatr	nent o	chemicals
n use des			SU21, PC20, P	C37, ERC	8b			
Processes, tasks activities covered			milk	-		rmulations in	to cor	tainer/preparation of lime
Assessment Method*				sessment sure of th nmen, 199	has been e eye. Dus 92).	t exposure ha	as bee	
ndition	s and	risk m	anagement	measu	res			
c	ategorie	s (ERC)			-			
Т	ransfer c	of lime sul	bstances (solid) in	nto contai	es (solid)) o ner for furth	f lime reactor ner applicatio	for w n.	ater treatment.
V	Vide disp	ersive inc	loor use of reacti	ve substa	nces in ope	en systems		
substar	nce in the		Physical state preparation	of the	Dustines	s (if relevant	:)	Packaging design
			(indicative fact shee		tive value from DIY		Bulk in bags or buckets/containers.	
Up to 99	Up to 99 %		Solid, granular of different size (D50 value 0.7 D50 value 1.75		low dustiness (reduction by 10% compared to powder)			Bulk-tank lorry or in "Bi Bags" or in sacks
			D50 value 5.06)				
ration			Amount used a	per event				
in lime re	actor for	aquaria	depending on the size of the water reactor to be filled (~ 100g /L)					
in lime rea	actor for		depending on the size of the water reactor to be filled (~up to 1.2 kg/L)					
ation			~ 20 g / 5L					
	posure							
oading, fill	ing and	1.33 mi (DIY-fa	n ct sheet, RIVM, Chapter 2.4.2		4.2	frequency of events 1 task/month 1task/week		ents
ne milk to	water			,		1 tasks/ month		
Populat	tion expo	osed	Breathing rate		Exposed body part			Corresponding skin area [cm²]
adult			1.25 m³/hr		Half of both hands			430 (RIVM report 320104007)
adult			NR		Hands			860 (RIVM report 320104007)
condition								
								exchange rate
•	Indoo	r/outdoor				ersonal space, small 0.		hr ⁻¹ (unspecified room or)
ne milk to	indooi	r		NR			NR	
		Inditions and No further Descriptic categorie Filling and Transfer C Dropwise Wide disp Sumers exponent Concentration c substance in the preparation Up to 99 % Up to 99 % of use/exposure pading, filling and me milk to water enced by risk mar Population exponent adult adult in line wilk to	ies covered Inditions and risk m No further product Description of act categories (ERC) Filling and re-filling Transfer of lime sul Dropwise application Wide dispersive ind Sumers exposure Concentration of the substance in the preparation Up to 100 % Up to 99 % Image: Constant state of the substance in the preparation Up to 100 % Up to 99 % Propulsion of act and the substance in the preparation Up to 99 % Ouration of use/exposure Duration and the substance in the preparation Up to 99 % Ouration and the substance in the preparation Of use/exposure Duration and the substance in the preparation Ouration and the substance in the preparation Operation and the substance in the preparation Operation and the substance in the preparation Operation and the substance in the preparation Duration and the substance in the substanc	ies covered Loading, filling of milk Application of lin Human health: A qualitative as well as for expo- model (van Her Environment: A qualitative justice integrated risk man Description of activity referring to categories (ERC) Filling and re-filling (transfer of lime substances (solid) in Dropwise application of lime milk to Wide dispersive indoor use of reaction SUMMETS EXPOSURE Concentration of the substance in the preparation Physical state preparation Up to 100 % Solid, granular different size (D50 value 0.7 D50 value 1.75 D50 value 0.7 D50 value 0.7	ies covered Loading, filling or re-filling, milk Application of lime milk to Application of lime milk to Human health: A qualitative assessment well as for exposure of th model (van Hemmen, 19) Environment: A qualitative justification at a qualitative integrated risk management Concentration of the substance in the preparation Physical state of the preparation Up to 100 % Solid, granular of different size (D50 value 0.7) Up to 99 % Solid, granular of different size of in lime reactor for aquaria depending on the size of in lime reactor for aquaria depending on the size of ato in lime reactor for aquaria depending on the size of in lime reactor for several minutes - hours anding, filling and 1.33 min (D1Y-fact sheet, RIV	ies covered Loading, filling or re-filling of solid fomilk Application of lime milk to water Human health: A qualitative assessment has been present as for exposure of the eye. Dus model (van Hemmen, 1992). Environment: A qualitative justification assessment A qualitative justification assessment Inditions and risk management measures Description of activity referring to article categories (categories (ERC) Filling and re-filling (transfer of lime substances (solid)) to container for furth Dropwise application of lime milk to water. Wide dispersive indoor use of reactive substances in opersubstance in the preparation Up to 100 % Solid, fine powder high dusti (indicative fract sheet 9.0.3) Up to 99 % Solid, granular of low dustir (reductior CD50 value 0.7 D50 value 1.75 D50 value 1.75 D50 value 1.75 D50 value 3.08) ration ~20 g / 5L of use/exposure Amount used per event in lime reactor for aquaria depending on the size of the water rein in lime reactor for aquaria depending on the size of the water rein in lime reactor for aquaria depending on the size of the water rein in lime reactor for aquaria depending on the size of the water rein in lime reactor for aquaria depending on the size of the water rein in lime reactor for aquaria dut 1.33 min (D)F-fact sheet, RIVM, Chapter 2.4.2 Mixing and loading of powders) <td>ies covered Loading, filling or re-filling of solid formulations in milk. Application of lime milk to water Human health: A qualitative assessment has been performed for well as for exposure of the eye. Dust exposure hat model (van Hemmen, 1992). Environment: A qualitative justification assessment is provided. No further product integrated risk management measures are in place Description of activity referring to article categories (AC) and env categories (ERC) Filling and re-filling (transfer of lime substances (solid)) of lime reactor Transfer of lime substances (solid) into container for further applicatio Dropwise application of lime milk to water. Wide dispersive indoor use of reactive substances in open systems SUMERS EXPOSURE Concentration of the substance in the preparation Physical state of the preparation Dustiness (if relevant findicative value from 1 fact sheet see section 9.0.3) Up to 100 % Solid, fine powder high dustiness (indicative value from 1 fact sheet see section 9.0.3) Up to 99 % Solid, granular of different size (D50 value 0.7 D50 value 1.75 D50 value 3.08) iow dustiness (reduction by 10% compared to powder) ration Amount used per event in lime reactor for ading, filling and (D1Y-fact sheet, RIVM, Chapter 2.4.2 Mixing and loading of powders) 1 task/moni 1 task/week task/week envilk to water Several minutes - hours 1 task/moni 1 task/week task/week Population exposed Breathing r</td> <td>ies covered Loading, filling or re-filling of solid formulations into commilik Application of lime milk to water Human health: A qualitative assessment has been performed for oral a well as for exposure of the eye. Dust exposure has been model (van Hemmen, 1992). Environment: A qualitative justification assessment is provided. Inditions and risk management measures are in place. Description of activity referring to article categories (AC) and environr categories (ERC) Filling and re-filling (transfer of lime substances (solid)) of lime reactor for w Transfer of lime substances (solid) into container for further application. Dropwise application of lime milk to water. Wide dispersive indoor use of reactive substances in open systems SUMER'S exposure Concentration of the substance in the preparation Physical state of the preparation Up to 100 % Solid, fine powder high dustiness (indicative value from DIY fact sheet see section 9.0.3) Up to 99 % Solid, granular of different size (D50 value 0.7 D50 value 3.08) low dustiness (reduction by 10% compared to powder) ration Amount used per event frequency of event task/month task/month in lime reactor for ading, filling and ading and loading of powders) 1 task/month task/week of use/exposure Breathing rate depending on the size of the water reactor to be filled (task/month task/week</td>	ies covered Loading, filling or re-filling of solid formulations in milk. Application of lime milk to water Human health: A qualitative assessment has been performed for well as for exposure of the eye. Dust exposure hat model (van Hemmen, 1992). Environment: A qualitative justification assessment is provided. No further product integrated risk management measures are in place Description of activity referring to article categories (AC) and env categories (ERC) Filling and re-filling (transfer of lime substances (solid)) of lime reactor Transfer of lime substances (solid) into container for further applicatio Dropwise application of lime milk to water. Wide dispersive indoor use of reactive substances in open systems SUMERS EXPOSURE Concentration of the substance in the preparation Physical state of the preparation Dustiness (if relevant findicative value from 1 fact sheet see section 9.0.3) Up to 100 % Solid, fine powder high dustiness (indicative value from 1 fact sheet see section 9.0.3) Up to 99 % Solid, granular of different size (D50 value 0.7 D50 value 1.75 D50 value 3.08) iow dustiness (reduction by 10% compared to powder) ration Amount used per event in lime reactor for ading, filling and (D1Y-fact sheet, RIVM, Chapter 2.4.2 Mixing and loading of powders) 1 task/moni 1 task/week task/week envilk to water Several minutes - hours 1 task/moni 1 task/week task/week Population exposed Breathing r	ies covered Loading, filling or re-filling of solid formulations into commilik Application of lime milk to water Human health: A qualitative assessment has been performed for oral a well as for exposure of the eye. Dust exposure has been model (van Hemmen, 1992). Environment: A qualitative justification assessment is provided. Inditions and risk management measures are in place. Description of activity referring to article categories (AC) and environr categories (ERC) Filling and re-filling (transfer of lime substances (solid)) of lime reactor for w Transfer of lime substances (solid) into container for further application. Dropwise application of lime milk to water. Wide dispersive indoor use of reactive substances in open systems SUMER'S exposure Concentration of the substance in the preparation Physical state of the preparation Up to 100 % Solid, fine powder high dustiness (indicative value from DIY fact sheet see section 9.0.3) Up to 99 % Solid, granular of different size (D50 value 0.7 D50 value 3.08) low dustiness (reduction by 10% compared to powder) ration Amount used per event frequency of event task/month task/month in lime reactor for ading, filling and ading and loading of powders) 1 task/month task/week of use/exposure Breathing rate depending on the size of the water reactor to be filled (task/month task/week

Trade name:	Half	-calcined Dolomite	
create date: 01.12.207	10 rev	ision date: 09.12.2010	print date: 09.12.2010
Keep container closed Use only with adequate In case of contact with Wash thoroughly after Do not mix with acids a Conditions and meas	eyes, rinse immediately with plenty handling. and always add limes to water and ne ures related to personal protectio	of water and seek medical advice. ot water to limes. n and hygiene	
	nvironmental exposure	a filtering half mask (mask type FFP2 acc. to	EN 149).
Not relevant for exposit Amounts used*	ure assessment		
Not relevant for expose Frequency and durate Not relevant for expose	ion of use		
Default river flow and c	not influenced by risk manageme lilution nal conditions affecting environme		
Indoor Conditions and meas Default size of municip	ures related to municipal sewage al sewage system/treatment plant ar ures related to external treatment	treatment plant nd sludge treatment technique	
Not relevant for exposi	ure assessment ures related to external recovery		
3. Exposure est The risk characterisation and is given in parenth respirable dust) and th since the respirable fra Since lime substances	imation and reference to on ratio (RCR) is the quotient of the r eses below. For inhalation exposure e respective inhalation exposure est iction is a sub-fraction of the inhalabl are classified as irritating to skin and	efined exposure estimate and the respective the RCR is based on the acute DNEL for lim imate (as inhalable dust). Thus, the RCR inclu	e substances of 4 mg/m ³ (as udes an additional safety margin
and exposure to the ey Human exposure	·e		
Preparation of lime m			
Route of exposure Oral	Exposure estimate	Method used, comments Qualitative assessment Oral eveneouse does not eccur as part of	f the intended product use
Dermal (powder)	small task: 0.1 μg/cm² (-) large task: 1 μg/cm² (-)	Oral exposure does not occur as part of Qualitative assessment If risk reduction measures are taken int is expected. However, dermal contact of direct contact to the lime cannot be exist are worn during application. This may of irritation easily avoided by prompt rinsi Quantitative assessment The constant rate model of ConsExpo rate to dust formed while pouring powod DIY-fact sheet (RIVM report 32010400 estimate will be even lower.	to account no human exposure to dust from loading of limes or cluded if no protective gloves occasionally result in mild ng with water. has been used. The contact ler has been taken from the
Eye	Dust	Qualitative assessment If risk reduction measures are taken int is expected. Dust from loading of the lin protective goggles are used. Prompt rin medical advice after accidental exposu	mes cannot be excluded if no nsing with water and seeking
Inhalation (powder)	Small task: 12 μg/m³ (0.003) Large task: 120 μg/m³ (0.03)	Quantitative assessment Dust formation while pouring the powd Dutch model (van Hemmen, 1992, as o above).	
Inhalation (granules)	Small task: 1.2 μg/m³ (0.0003) Large task: 12 μg/m³ (0.003)	Quantitative assessment Dust formation while pouring the powd Dutch model (van Hemmen, 1992 as d above) and applying a dust reduction fa	escribed in section 9.0.3.1
Dropwise application			
Route of exposure	Exposure estimate	Method used, comments Qualitative assessment	
Dermal	Droplets or splashes	Oral exposure does not occur as part of Qualitative assessment If risk reduction measures are taken int is expected. However, splashes on the protective gloves are worn during appli occasionally result in mild irritation eas of the hands in water.	to account no human exposure skin cannot be excluded if no cation. Splashes may

Trade name: create date: 01.12.2	2010	Half-calcined Dolomite revision date: 09.12.2010	print date: 09.12.2010
Eye	Droplets or splashes	is expected. However, splashes in protective goggles are worn during However, it is rare for eye irritation a clear solution of calcium hydroxi can easily be avoided by immedia Qualitative assessment	n to occur as a result of exposure to de (lime water) and mild irritation te rinsing of the eyes with water.
		Not expected, as the vapour press generation of mists or aerosols do	
Environmental exp			
often neutralized any WWTPs. Since the p	yway and lime may even be use bH of the influent of the municipa	pected to be negligible. The influent of a municip to beneficially for pH control of acid wastewater s al treatment plant is circum neutral, the pH impa r, sediment and terrestrial compartment.	streams that are treated in biological

Trade name:	Half-calcined Dolomite	
create date: 01.12.2010	revision date: 09.12.2010	print date: 09.12.2010

ES number 9.16: Consumer use of cosmetics containing lime substances

Exposure Scenario Format (2) addressing uses carried out by consumers				
1. Title				
Free short title	Consumer use of cosmetics containing limes			
Systematic title based on use descriptor	SU21, PC39, ERC8a			
Processes, tasks activities covered	5021, FC39, ERC0d			
Assessment Method*	Human health: According to Article 14(5) (b) of regulation (EC) 1907/2006 risks to human health need not be considered for substances included in cosmetic products within the scope of Directive 76/768/EC. Environment A qualitative justification assessment is provided.			
2. Operational conditions and risk mana				
ERC 8a Wide dispersive indoor use of processing aids in open systems				
2.1 Control of consumers exposure				
Product characteristic				
Not relevant, as the risk to human health from this us	e does not need to be considered			
Amounts used				
Not relevant, as the risk to human health from this us	e does not need to be considered			
Frequency and duration of use/exposure				
Not relevant, as the risk to human health from this us	e does not need to be considered.			
Human factors not influenced by risk managemen				
Not relevant, as the risk to human health from this us				
Other given operational conditions affecting const				
Not relevant, as the risk to human health from this us				
Conditions and measures related to information a				
Not relevant, as the risk to human health from this us				
Conditions and measures related to personal pro				
Not relevant, as the risk to human health from this us				
2.2 Control of environmental exposure				
Product characteristics				
Not relevant for exposure assessment				
Amounts used*				
Not relevant for exposure assessment				
Frequency and duration of use				
Not relevant for exposure assessment				
Environment factors not influenced by risk management				
Default river flow and dilution	gonion			
Other given operational conditions affecting envir	ronmental exposure			
Indoor				
Conditions and measures related to municipal se	wage treatment plant			
Default size of municipal sewage system/treatment plant and sludge treatment technique Conditions and measures related to external treatment of waste for disposal				
Not relevant for exposure assessment				
Conditions and measures related to external recovery of waste				
Not relevant for exposure assessment				
3. Exposure estimation and reference to its source				
Human exposure				
Human exposure to cosmetics will be addressed by other legislation and therefore need not be addressed under regulation (EC) 1907/2006 according to Article 14(5) (b) of this regulation.				
Environmental exposure				
The pH impact due to use of lime in cosmetics is exported often neutralized anyway and lime may even be used	ected to be negligible. The influent of a municipal wastewater treatment plant is I beneficially for pH control of acid wastewater streams that are treated in biological treatment plant is circum neutral, the pH impact is negligible on the receiving sediment and terrestrial compartment.			

End of the safety data sheet