

# EXPOSURE SCENARIO

Exposure scenario were elaborated from sodium hydroxide Ca (OH) 2 \* scenario. This exposure scenario describes how to use safely Oikos product by professional user and consumer.

\* Scenario attached to PRODUCT SAFETY DATA SHEET for Ca (OH) 2 CAS: 1305-62-0 Registration No. 01-2119475151-45-0201, prepared in compliance with Annex II of REACH Regulation EC 1907/2006, Regulation (EC) 1272/2008 and Regulation (EC) 453/2010.

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## Acronymis:

SU: sector of use

PC: chemical product category

AC: article category

PROC: process category

ERC: environmental release caegory

## ES1 - Professional use of aqueous solutions of lime based substances (Construction and Building Materials)

### 1. Title

**Short title:** Professional use of aqueous solutions of lime based substances (Construction and Building Materials)

**Systematic title based on a descriptor of use:** SU22 (professional use)  
PC9a coatings and paints, thinners, paint removers  
PC9b Fillers, putties, plasters, modelling clay  
(for PROC and ERC see in Section 2 below)

**Processes, tasks and/or activities included** Described in Section 2 below.

**Evaluation method** The inhalation exposure assessment is based on the MEASE exposure estimation tool. The environmental assessment is based on FOCUS-Exposit.

### 2. Conditions of use affecting exposure

**PROC 10** Roller application or brushing

**PROC 11** Non industrial spraying

**PROC 19** Manual activities involving hand contact.

**ERC 8c, 8d, 8e, 8f** Widespread use leading to inclusion into/onto articles (indoor)

Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor).

Widespread use of reactive processing aid (no inclusion into or onto article, outdoor).

Widespread use leading to inclusion into/onto article (outdoor).

#### 2.1 Worker contributing scenario

##### Product characteristics

According to the MEASE approach, the intrinsic emission potential of a substance is one of the main determinants of exposure. This is mirrored by the assignment of a so-called fugacity class in MEASE. For operations carried out with solid substances at room temperature, the fugacity is based on the

dustiness of this substance. The aqueous solution spray (PROC11) is supposed to have an average emission level.

PROC	Amount used	Physical form	Emission potential
<b>All others applicable PROC</b>	Not regulated	Water solution	Very low

**Used amounts**

It is not believed that the actual tonnage handled per shift affects the exposure as such for this scenario. The main determinant of the intrinsic emission potential of the process is the combination of the scale of the operation (industrial vs. professional) and the level of containment / automation (as reflection in PROC).

**Frequency and duration of use / exposure**

**PROC**                      **Duration of use**  
**PROC 11**                      ≤ 240 minutes  
**All applicable PROC** 480 minuti (not regulated)

**Technical conditions and measures to control dispersal from the source to the worker**

PROC	Separation level	Localized controls (LC)	Efficiency of LC (according to MEASE)	Further information
<b>PROC 19</b>	Generally, in executed processes, it is not required to separate workers from the source.	not applicable	nd	-
<b>All others applicable PROC</b>	Not requested	nd	-	

**Organizational measures to prevent / limit release, dispersal and exposure**

Avoid inhalation or ingestion. To ensure safe handling of the substance, general professional hygiene measures are required. These measures concern good personal and cleaning practices (ie, regular cleaning with suitable devices), prohibition of eating and smoking in the workplace, the adoption of standard work clothes and footwear, unless otherwise stated below. Shower and change clothes at the end of the shift. Do not wear contaminated clothing at home. Do not blow away the dust with compressed air.

**Conditions and measures related to personal protection, hygiene and health**

PROC	Specification of the respiratory protective device (RPE)	RPE efficiency (assigned protection factor, APF)	Specification of gloves	Additional Personal Protective Equipment (PPE)
<b>PROC 11</b>	mask FFP3	APF=20	Since Ca (OH) 2 is classified as a skin irritant, it is mandatory to use protective gloves (EN374) for all stages of the process.	Wear eye protection (eg glasses or masks), unless, given the nature and type of application (ie, closed process), potential contact with the eyes can not be ruled out. In addition, you must wear appropriate face protection, protective clothing, and appropriate footwear.
<b>All others applicable PROC</b>	Not requested		nd	

Wear eye protection (eg glasses or masks), unless, given the nature and type of application (ie, closed process), potential contact with the eyes can not be ruled out. In addition, you must wear appropriate face protection, protective clothing, and appropriate footwear. Any RPE as defined above should only be worn if, at the same time, the following principles are applied: working time (compare with "exposure duration" above) should take into account the further physiological stress for the worker due to Respiratory resistance and the mass of the EPR, due to the increased thermal stress induced by head protection. It should also be considered that wearing an RPE reduces the worker's ability to communicate and use tools.

For these reasons, the worker should therefore be (i) in good health (especially considering medical problems that could affect the use of RPE), (ii) have facial features that reduce infiltration between the face and the mask (In consideration of scratches and facial hair). The above-mentioned devices, which rely on facial airtightness, will not provide the required protection if they do not adhere correctly and safely to the contours of the face.

Employers and self-employed workers have legal responsibilities for the maintenance and provision of respiratory protective devices and the proper management of their workplace use. Therefore, they must define and document a suitable policy for a program for respiratory protection devices, including worker training.

**2.2 Environment contributing scenario:**

**Product characteristics**

The physical form of the product (pasty, viscous liquid) excludes sliding considerations (dust measurement in the air depending on distance from application).

**Other applicable operating conditions that affect environmental exposure**

External and internal use of the products

**Technical conditions and technical measures at the process (source) to avoid release**

Use original containers, avoid spills.

**In-situ mechanical conditions and measures to reduce or eliminate drains and releases into the ground**

Dispose product residues properly in accordance with local regulations, avoid spreading on the ground and drainage.

**3. Exposure estimation and reference to its source**

**Professional exposition**

The MEASE exposure estimation tool was used for evaluation of inhalation exposure. Risk Characterization Report (RCR) is the quotient of the Exposure Estimated Exposure and the respective DNEL (Derived Derivatives Level) and must be less than 1 to demonstrate safe use. For inhalation exposure, RCR is based on DNEL for Ca (OH) 2 of 1 mg / m<sup>3</sup> (as breathable powder) and their respective estimate of inhaled exposure by using MEASE (as inhalable dust). Therefore, the RCR includes an additional safety margin since the breathable fraction is a subfraction of the inhalable fraction according to EN 481.

PROC	Method used for assessment of inhalation exposure	Estimation of inhalation exposure (RCR)	Method used to evaluate dermal exposure	Estimation of Dermal Exposure (RCR)
PROC 10, 11, 19	MEASE	< 1 mg/m <sup>3</sup> (<0,001 - 0,6)	Since Ca (OH) 2 is classified as irritating to the skin, it is necessary to minimize the dermatological exposure as technically possible. No DNEL was derived for dermal effects. Therefore, dermal exposure is not evaluated in this exposure scenario.	

**Other conditions affecting environmental exposure**

Lime is an ingredient and is chemically bound in a matrix. Releases are negligible and insufficient to cause a pH variation in soil, waste water, or surface water.

**4. Guidance for Downstream Users on how to evaluate whether he works inside the boundaries set by the ES**

The downstream user (DU) operates within the limits set by the ES if the proposed risk management measures described above are met or if it can demonstrate that its operational conditions and the measures taken to manage risk are adequate. To this end, it must be demonstrated that it limits inhalation and dermal exposure to a level lower than the respective DNEL (as the processes and activities in question are treated by the above listed PROCs) as specified below. If no measured data is available, the DU may use an appropriate scale instrument such as MEASE ([www.ebrc.de/mease.html](http://www.ebrc.de/mease.html)) to estimate associated exposure. The dustiness of the substance used can be determined by the MEASE glossary. For example, substances with a dustiness of less than 2.5% according to the Rotating Drum Method (RDM) are defined as "slightly dusty", those with a dustiness of less than 10% (RDM) are defined as "moderately dusty" and those with a dustiness of  $\geq 10\%$  are defined as "highly dusty".

DNEL<sub>inhalation</sub>: 1 mg / m<sup>3</sup> (as breathable powder)

Important Note: DU should be aware that, apart from the long-term DNEL indicated above, there is a DNEL for acute effects at a level of 4 mg / m<sup>3</sup>. Demonstrating safe use compared to exposure estimates with long-term DNEL is also covered by acute DNEL (according to guidance R.14, it is possible to derive acute exposure levels by multiplying the long-term exposure estimates for a factor of 2). When using MEASE to derive exposure estimates, it should be noted that exposure duration should only be reduced to half-turn as a risk management measure (resulting in a 40% reduction in exposure).

## ES2 – Use by consumers of Construction and Building Materials (DIY)

### 1. Titolo

<b>Short title:</b>	Use by consumers of Construction and Building Materials (DIY)
<b>Systematic title based on a descriptor of use:</b>	SU21, PC9a, PC9b, ERC8c, ERC8d, ERC8e, ERC8f
<b>Processes, tasks and / or activities included</b>	Application of liquid lime preparations, pasty.
<b>Evaluation method</b>	Human health: A qualitative assessment was performed for oral and dermal exposure, as well as for the eyes. Exposure by powder inhalation was evaluated with the Dutch model (van Hemmen, 1992). Environment: An assessment of qualitative justification is provided.

### 2. Conditions of use affecting exposure

<b>RMM</b>	Integrated product risk management measures are not in place.
<b>PC/ERC</b>	Description of the activity related to the categories of articles (ACs) and the environmental release categories (ERCs)
<b>PC 9a, 9b</b>	PC9a coatings and paints, thinners, paint removers PC9b Fillers, putties, plasters, modelling clay Application of plaster based on lime, stucco or liquid mortar on walls or ceilings. Post-application exposure.
<b>ERC 8c, 8d, 8e, 8f</b>	Widespread use leading to inclusion into/onto articles (indoor) Widespread use of non-reactive processing aid (no inclusion into or onto article, indoor). Widespread use of reactive processing aid (no inclusion into or onto article, outdoor). Widespread use leading to inclusion into/onto article (outdoor).

#### 2.1 Worker contributing scenario

**Product characteristics:**

Mixture description	Amount of the substance into the mixture	Physical form of the mixture	Dustiness (if relevant)	Kind of packaging
Plaster, mortar	20-40%	Pasty	-	-
Putty, filler	30-55%	Pasty, highly viscous	-	Tube or drum
Lime-based water-based painting / lime-milk preparation	~ 30%	Lime-milk preparation	-	-

**Used amount****Mixture description**

Putty, filler

**Used amount for each event**

1-2 kg powder

Hard to determine because the amount depends heavily on the depth and size of the holes to be filled.

Lime-based water-based painting / lime-milk preparation

~ 25 kg Depending on the size of the room, the wall to be treated.

Plaster

~ 25 kg Depending on the size of the room, the wall to be treated.

**Frequency and duration of use / exposure****Description of activity****Exposition duration per event****Frequency of events**

Application of plaster based on lime, stucco or liquid mortar on walls or ceilings.

Several minutes, hours

2/year

**Human factors not influenced by risk management****Description of activity****Population exposed****Breathed volume****Exposed body part****Corresponding skin area [cm<sup>2</sup>]**

Application of liquid lime preparations, pasty.

Adult

NR

Hands and forearms

1900

**Other specific operating conditions affecting consumer exposure****Activity description****Inside/outside****Room volume****Air exchange rate**

Application of liquid lime preparations, pasty.

Inside

NR

NR

**Conditions and measures for Consumer Information**

To avoid health damage, DIY users must comply with the same rigid protective measures that apply to professional workplaces:

- Immediately change clothing, footwear, and damp gloves.
- Protect skin's exposed areas (arms, legs, face): There are many effective skin protection products that must be used in accordance with a skin protection plan (skin protection, cleansing and care). Carefully clean the skin after work and apply a skin care product.

**Conditions and measures related to personal protection and hygiene**

To avoid health damage, DIY users must comply with the same rigid protective measures that apply to professional workplaces:

- Wear protective glasses and facial masks when working or demolishing construction materials and, above all, during work overhead.
- Carefully select work gloves. Leather gloves get wet and can make burns easier. When working in a damp environment, it is best to wear cotton gloves with plastic coating (nitrile). Wear long protective gloves during work on the head because they can greatly reduce the amount of moisture permeating work clothes.

**2.2 Environmental contributing scenario:****Product characteristics**

Not relevant for exposure assessment

**Used amount**

Not relevant for exposure assessment.

**Frequency and duration of use / exposure**

Not relevant for exposure assessment.

**Environmental factors not influenced by risk management**

Default flow rate and dilution.

**Other conditions affecting environmental exposure**

Internal Avoids direct discharge into waste water.

**Conditions and measures for the municipal waste water treatment plant**

Predefined dimensions of the sewage system / municipal treatment plant and sludge treatment technique

**Conditions and measures for the external treatment of waste water for disposal**

Not relevant for exposure assessment.

**Conditions and measures for the external recovery of wastewater**

Not relevant for exposure assessment.

**3. Exposure estimation and reference to its source**

The risk characterization ratio (RCR) is the quotient of the refined exposure estimate and the respective DNEL (deriving no effect level) and is given in parentheses below. For inhalation exposure, RCR is based on acute DNEL for lime based substances of 4 mg / m3 (as breathable powder) and their respective inhalation exposure estimate (such as inhalable dust). Therefore, the RCR includes an additional safety margin since the breathable fraction is a subfraction of the inhalable fraction according to EN 481.

Since lime is classified as irritant to the skin and eyes, a qualitative assessment for skin and eye exposure has been performed.

**Human exposure**

**Application of liquid/pasty lime preparations**

**Route of exposure**

**Exposure estimate**

**Used method**

Oral

-

Qualitative assessment  
Oral exposure does not occur in the intended use of the product.  
Qualitative assessment  
If risk reduction measures are taken into consideration, no human exposure is anticipated. However, it is not possible to exclude splashes on the skin if you do not wear protective gloves during the application. Splashes may occasionally result in slight irritation that can easily be avoided by immediate water rinsing.

Dermic

splashes

Qualitative assessment  
If you wear appropriate eyewear, no exposure to the eyes is expected. However, splashes in the eyes may not be excluded if, during application of liquid or lime paste, no protective glasses are used, especially during work on the head. After an accidental exposure, it is advisable to rinse immediately with water and seek medical advice.

Eyes

Splashes

Qualitative assessment  
Not foreseen, since the lime vapor voltage in the water is low and no sprays or aerosols are generated.

Inhalation

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**Exposure post-application**

No relevant exposure is assumed since the carbon dioxide present in the atmosphere will soon transform the calcium hydroxide-based preparation in calcium carbonate.

#### **Environmental exposure**

With respect to the environmentally friendly OC / RMM to discharge lime solutions directly into the urban waste water, the pH of the flow of the water treatment plant is almost neutral and therefore is not exposed to biological activity. The affluent of a municipal wastewater treatment plant is often neutralized and lime can also be effectively used to control the pH of wastewater treated with water treated in WWTP. Since the pH of the municipal treatment plant is almost neutral, the impact of pH is negligible in environmental containers such as surface, sediment and compartmental soil.

#### **4. Guidance for Downstream Users on how to evaluate whether he works inside the boundaries set by the ES**

The downstream user (DU) operates within the limits set by the ES if the proposed risk management measures described above are met or if it can demonstrate that its operational conditions and the measures taken to manage risk are adequate. To this end, it must be demonstrated that it limits inhalation and dermal exposure to a level lower than the respective DNEL (as the processes and activities in question are treated by the above listed PROCs) as specified below. If no measured data is available, the DU may use an appropriate scale instrument such as MEASE ([www.ebrc.de/mease.html](http://www.ebrc.de/mease.html)) to estimate associated exposure. The dustiness of the substance used can be determined by the MEASE glossary. For example, substances with a dustiness of less than 2.5% according to the Rotating Drum Method (RDM) are defined as "slightly dusty", those with a dustiness of less than 10% (RDM) are defined as "moderately dusty" and those with a dustiness of  $\geq 10\%$  are defined as "highly dusty".

DNEL<sub>nation</sub>: 1 mg / m<sup>3</sup> (as breathable powder)

Important Note: DU should be aware that, apart from the long-term DNEL indicated above, there is a DNEL for acute effects at a level of 4 mg / m<sup>3</sup>. Demonstrating safe use compared to exposure estimates with long-term DNEL is also covered by acute DNEL (according to guidance R.14, it is possible to derive acute exposure levels by multiplying the long-term exposure estimates for a factor of 2). When using MEASE to derive exposure estimates, it should be noted that exposure duration should only be reduced to half-turn as a risk management measure (resulting in a 40% reduction in exposure).

### **ES3 - Professional uses of articles /containers containing lime based substances**

#### **1. Title**

**Short title:** Professional uses of articles / containers containing lime-based substances

**Systematic title based on a descriptor of use:** SU22, SU1, AC7, AC11, AC13  
(for PROC and ERC see in Section 2 below)

**Processes, tasks and/or activities included** Processes, tasks and / or activities included are described in Section 2 below.

**Evaluation method** The inhalation exposure assessment is based on the MEASE exposure estimation tool.

#### **2. Conditions of use affecting exposure**

<b>PROC/ERC</b>	<b>REACH definition</b>	<b>Activities related</b>
<b>PROC 21</b>	Low energy manipulation and handling of substances bound in/on materials or articles.	Manipulation of substances present in materials and / or articles
<b>ERC10, ERC11, ERC 12</b>	Widespread use of articles with low release	Ca (OH) 2 bonded in or in articles and materials such as: building materials and wood and plastic constructions (eg pans, drains), flooring, furniture, toys, leather products,

(outdoor/indoor). paper and board products (magazines, Books, Newspapers and Packaging Paper), Electronic Equipment (Winding)

## 2.1 Worker contributing scenario

### Product characteristics

Articles (plastic or metal packaging) containing residues of processing of pasty preparations, which have become solid after drying.

PROC	Use	Amount in the product	Physical form	Emission potential
PROC 21	Not regulated	Objects in massive solid form		Very low

### Used amount

It is not considered that the actual tonnage handled per shift affects the exposure as such for this scenario. The main determinant of the intrinsic emission potential of the process is the combination of the scale of the operation (industrial vs. professional) and the level of containment / automation (as reflected in the PROC)

### Frequency and duration of use / exposure

#### PROC

#### PROC 21

#### Duration of exposure

480 minutes (not regulated for professional exposure to Ca (OH) 2, actual use life may be limited by the instructions for the actual respirator worn by the user)

### Technical conditions and technical measures at the process (source) to avoid release

Generally, processes are not required for process-level risk management (eg containment or segregation of the emission source).

Technical conditions and measures to control dispersal from the source to the worker

PROC	Separation level	Localized controls (LC)	Efficiency of LC (according to MEASE)	Further information
PROC 21	Any potentially required separation of workers from the source of emission is indicated above in "Frequency and duration of exposure". You can achieve a reduction in exposure duration by, for example, ventilated control rooms (positive pressure) or by removing the worker from the places where exposure is concerned.	Not requested	nd	-

Organizational measures to prevent / limit release, dispersal and exposure

To ensure safe handling of the substance, general professional hygiene measures are required.

These measures concern good personal and cleaning practices (ie, regular cleaning with suitable devices), prohibition of eating and smoking in the workplace, the adoption of standard work clothes and footwear, unless otherwise stated below. Shower and change clothes at the end of the shift. Do not wear contaminated clothing at home. Do not blow away the dust with compressed air.

### Conditions and measures concerning individual protection, hygiene and health status

#### assessment

PROC	Specification of the respiratory protective device (RPE)	RPE efficiency (assigned protection factor, APF)	Specification of gloves	Additional Personal Protective Equipment (PPE)

PROC 21	Not requested	nd	Since Ca (OH) 2 is classified as a skin irritant, it is mandatory to use protective gloves for all stages of the process.	Wear eye protection (glasses or masks), unless, given the nature and type of application (ie, closed process), potential contact with the eyes can not be ruled out. In addition, you must wear appropriate face protection, protective clothing, and appropriate footwear.
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Any RPE as defined above should only be worn if, at the same time, the following principles are applied: working time (compare with "exposure duration" above) should take into account the additional physiological stress for the worker due to Respiratory resilience and the mass of the EPR, due to the increased thermal stress induced by head protection. It should also be considered that wearing an RPE reduces the worker's ability to communicate and use tools.

For these reasons, the worker should therefore be (i) in good health (especially considering medical problems that could affect the use of RPE), (ii) have facial features that reduce infiltration between the face and the mask (In consideration of scratches and facial hair). The above-mentioned devices, which rely on facial airtightness, will not provide the required protection if they do not adhere correctly and safely to the contours of the face.

Employers and self-employed workers have legal responsibilities for the maintenance and provision of respiratory protective devices and the proper management of their workplace use. Therefore, they must define and document a suitable policy for a program for respiratory protection devices, including worker training.

## 2.2 Environment contributing scenario

### Product characteristics

Lime is chemically bonded to / on a matrix with a very low release potential

## 3. Exposure estimation and reference to its source

### Worker contributing scenario

The MEASE exposure estimation tool was used for evaluation of inhalation exposure. Risk Characterization Report (RCR) is the quotient of the Exposure Estimated Exposure and the respective DNEL (Derived Derivatives Level) and must be less than 1 to demonstrate safe use. For inhalation exposure, RCR is based on DNEL for Ca (OH) 2 of 1 mg / m<sup>3</sup> (as breathable powder) and their respective estimate of inhaled exposure by using MEASE (as inhalable dust). Therefore, the RCR includes an additional margin of safety since the breathable fraction is a subfraction of the inhalable fraction according to EN 481.

PROC	Method used for assessment of inhalation exposure	Estimation of inhalation exposure (RCR)	Method used to evaluate dermal exposure	Estimation of Dermal Exposure (RCR)
PROC 21	MEASE	0,05 mg/m <sup>3</sup> (0,05)	Since Ca (OH) 2 is classified as irritating to the skin, it is necessary to minimize the dermatological exposure as technically possible. No DNEL was derived for dermal effects. Therefore, dermal exposure is not evaluated in this exposure scenario.	

### Environmental contributing scenario

Lime is an ingredient and is chemically bound in a matrix: no lime release is expected under normal conditions of use and those reasonably foreseeable. Releases are negligible and insufficient to cause

a pH variation in soil, waste water, or surface water.

#### **4. Guidance for Downstream Users on how to evaluate whether he works inside the boundaries set by the ES**

The downstream user (DU) operates within the limits set by the ES if the proposed risk management measures described above are met or if it can demonstrate that its operational conditions and the measures taken to manage risk are adequate. To this end, it must be demonstrated that it limits inhalation and dermal exposure to a level lower than the respective DNEL (as the processes and activities in question are treated by the above listed PROCs) as specified below. If no measured data is available, the DU may use an appropriate scale instrument such as MEASE ([www.ebrc.de/mease.html](http://www.ebrc.de/mease.html)) to estimate associated exposure. The dustiness of the substance used can be determined by the MEASE glossary. For example, substances with a dustiness of less than 2.5% according to the Rotating Drum Method (RDM) are defined as "slightly dusty", those with a dustiness of less than 10% (RDM) are defined as "moderately dusty" and those with a dustiness Of  $\geq 10\%$  are defined as "highly dusty".

DNELnation: 1 mg / m<sup>3</sup> (as breathable powder)

Important Note: DU should be aware that, apart from the long-term DNEL indicated above, there is a DNEL for acute effects at a level of 4 mg / m<sup>3</sup>. Demonstrating safe use compared to exposure estimates with long-term DNEL is also covered by acute DNEL (according to guidance R.14, it is possible to derive acute exposure levels by multiplying the long-term exposure estimates for a factor of 2). When using MEASE to derive exposure estimates, it should be noted that exposure duration should only be reduced to half-turn as a risk management measure (resulting in a 40% reduction in exposure).