

TARMAC BUXTON LIME & POWDERS

Tarmac Buxton Cement and Lime

PRODUCT SAFETY DATA SHEET

CALCIUM OXIDE

Prepared in accordance with Regulation EC 1907/2006 (REACH), Regulation (EC) 1272/2008 (CLP, as amended)

1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

1.1: Identification of the substance or preparation

Substance Name:	Calcium Oxide, Burnt Lime
Synonyms:	Calcium Oxide, Lime, Burnt lime, Un-slaked lime, Chemical lime, Calcium monoxide, Calcined limestone.
Chemical Name and Formula:	Calcium Oxide – CaO
Trade Name:	Calbux, Biocal, Limbase
CAS N°:	1305-78-8
EINECS N°:	215-138-9
Molecular Weight:	56.08 g/mol
Reach Registration No:	01-2119475325-36-0121

1.2: Use of the substance

The substance is intended for the following non-exhaustive list of uses:

Building material industry, Chemical industry, Agriculture, Biocidal use, Environmental protection (e.g. flue gas treatment, waste water treatment, sludge treatment), Drinking water treatment, Feed, food and pharmaceutical industry, Civil engineering, Paper and paint 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: Company Identification

Name:	Tarmac Cement & Lime
Address:	Buxton Lime & Powders Tunstead House Buxton Derbyshire SK17 8TG
Phone:	+44 (0)1298 768555

E-mail of competent person responsible for SDS : buxton.enquiry@tarmac.com

1.4: Emergency telephone

UK/European Emergency N°: 999/112
 BL&C Transport Emergency Contact N°: +44 (0)1298 27500 (including out of hours)
 Refer to Hospital Accident and Emergency Department

2: HAZARDS IDENTIFICATION

2.1: Classification of the Substance

2.1.1: Classification according to Regulation (EC) 1272/2008

STOT Single Exp. 3, H335 Route of exposure: Inhalation
 Skin Irritation 2, H315
 Eye Damage 1, H318

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 pictogram:



Hazard statements:

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

Precautionary statements:

P102: Keep out of reach of children
 P280: Wear protective gloves/protective clothing/eye protection/face protection
 P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
 P302+P352: IF ON SKIN: Wash with plenty of water
 P310: Immediately call a poison centre or doctor/physician
 P261: Avoid breathing dust/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

2.3: Other hazards

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

3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1: Composition

CAS number	EC number	Registration No	Identification name	Weight % content (or range)	Classification according to Regulation (EC) No 1272/2008 [CLP]
1305-78-8	215-138-9	01-2119475325-36-0121	Calcium Oxide	92-99%	Eye Dam 1 H318 Skin Irrit. 2 H315 STOT SE 3 (inhalation) H335

Impurities: No impurities relevant for classification and labelling.
Small quantities of calcium carbonate and impurities. Impurities in lime products will vary from source to source.

4: **FIRST-AID MEASURES**

4.1: **General Advice**

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

Following Eye Contact:

Rinse eyes immediately with plenty of water and seek medical advice.

Following Inhalation:

Move source of dust or move person to fresh air. Obtain medical attention immediately.

Following Ingestion:

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

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.

Self-protection of the first aider

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).

4.2: **Most important symptoms and effects, both acute and delayed**

Calcium oxide 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 advice given in section 4.1

5: **FIRE-FIGHTING MEASURES**

5.1.1: **Suitable extinguishing media**

The product is not combustible. Use a dry powder, foam or CO₂ 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. Avoid humidification.

5.2: **Special hazards arising from the substance or mixture**

Calcium oxide reacts with water and generates heat. This may cause risk to flammable material.

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.

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).

Avoid humidification

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 equipment (see section 8)

Avoid humidification

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 Appendix of this safety data sheet.

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. Minimise 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.

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 in the Appendix, and check '2.1: Control of worker' in the relevant exposure scenario section in the Appendix.

8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1: Control parameters

DNELs:

Workers				
Route of exposure	Acute effect 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 effect 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 / 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

PNECs:

Environment protection target	PNEC	Remarks
Fresh water	0.37 mg / L	
Freshwater sediments	No PNEC available	Insufficient data available
Marine water	0.24 mg / L	
Marine sediments	No PNEC available	Insufficient data available
Food (bioaccumulation)	No hazard identified	No potential for bioaccumulation
Microorganisms in sewage treatment	2.27 mg / L	
Soil (agricultural)	817.4 mg / kg soil dw	
Air	No hazard identified	

OELs:

8 hours limit value	1 mg/m ³ respirable fraction
Short-term limit value	4 mg/m ³ respirable fraction

According to Directive (EU) 2017/164 of 31 January 2017

United Kingdom:

Occupational Exposure Limits (OEL) (8hr TWA): 2 mg/m³

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 calcium oxide 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 control

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.

9: PHYSICAL AND CHEMICAL PROPERTIES

9.1: Information on basic physical and chemical properties

Appearance:	White or off-white (beige) solid material of varying sizes: Lump granular or fine powder
Odour:	odourless
Odour threshold:	not applicable
pH:	12.3 (saturated solution at 20 °C)
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 commonly associated with explosive properties)
Vapour pressure:	Not applicable (solid with a melting point > 450°C)
Vapour density:	Not applicable
Relative density:	3.31 (study result, EU A.3 method)
Solubility in water:	1337.6 mg/L (study results, EU A.6 method)
Partition coefficient:	Not applicable (inorganic substance)
Auto ignition temperature:	No relative self-ignition temperature below 400°C (study result, EU A.16 method)
Decomposition temperature:	Not applicable
Viscosity:	Not applicable (solid with a melting point > 450°C)
Explosive properties:	Non explosive (considered to be “inert” in the context of explosivity, since it represents calcium and oxygen being already in their preferred oxidation state)
Oxidising properties:	No oxidising properties (Based on the chemical structure, the substance does not contain a surplus of oxygen or any structural groups known to be correlated with a tendency to react exothermally with combustible material)

9.2: Other Information

Not available

10: STABILITY AND REACTIVITY

10.1: Reactivity

Calcium oxide reacts exothermically with water to form Calcium dihydroxide

10.2: Chemical stability

Under normal conditions of use and storage (dry conditions), calcium oxide is stable

10.3: Possibility of hazardous reactions

Calcium oxide reacts exothermically with acids to form calcium salts

10.4: Conditions to avoid

Minimise exposure to air and moisture to avoid degradation.

10.5: Incompatible materials

Calcium oxide reacts exothermically with water to form Calcium dihydroxide:



Calcium oxide reacts exothermically with acids to form salts.

Calcium dihydroxide reacts with aluminium and brass in the presence of moisture leading to the production of hydrogen: $\text{CaO} + 2 \text{Al} + 7 \text{H}_2\text{O} \rightarrow \text{Ca[Al(OH)}_4\text{]}_2 + 3 \text{H}_2$

10.6: Hazardous decomposition products

None.

Further information: Calcium oxide absorbs moisture and carbon dioxide from air to form calcium carbonate, which is a common material in nature.

11: TOXICOLOGICAL INFORMATION

11.1: Information on toxicological effects

Acute toxicity:

Oral: $\text{LD}_{50} > 2000 \text{ mg/kg bw}$ (OECD 425, rat)

Dermal: $\text{LD}_{50} > 2500 \text{ mg/kg bw}$ (calcium dihydroxide OECD 402, rabbit); by read across these results are also applicable to calcium oxide, since in contact with moisture calcium hydroxide is formed.

Inhalation: no data available

Calcium oxide is not acutely toxic

Skin irritation / corrosion:

Calcium oxide is irritating to skin (in vivo, rabbit).

Calcium dihydroxide is not corrosive to skin (in vitro, OECD 4321) By read across these results are also applicable to calcium oxide.

Serious eye damage/irritation:

Calcium oxide entails a risk of serious damage to the eye (in vivo, rabbit)

Respiratory or skin sensitisation:

No data available.

Calcium oxide is considered not to be a skin sensitiser, based on the nature of the effect (pH shift) and the essential requirement of calcium for human nutrition.

Germ cell mutagenicity:

Calcium dihydroxide is not genotoxic (in vitro, OECD 471, 473 and 476) By read across these results are also applicable to calcium oxide.

In view of the omnipresence and essentiality of Ca and of the physiological non-relevance of any pH shift induced by lime in aqueous media, CaO is obviously void of any genotoxic potential.

Carcinogenicity:

Calcium (administered as Ca-lactate) is not carcinogenic (experimental result, rat). The pH effect of calcium oxide does not give rise to a carcinogenic risk.

Human epidemiological data support lack of any carcinogenic potential of calcium oxide.

Reproductive toxicity:

Calcium (administered as Ca-carbonate) is not toxic to reproduction (experimental result, mouse).

The pH effect does not give rise to a reproductive risk.

Human epidemiological data support lack of any potential for reproductive toxicity of calcium dihydroxide.

Both in animal studies and human clinical studies on various calcium salts no reproductive or developmental effects were detected. Also see the Scientific Committee on Food (Section 16.6). Thus, calcium oxide is not toxic for reproduction and/or development.

STOT – single exposure:

From human data it is concluded that CaO is irritating to the respiratory tract. As summarised and evaluated in the SCOEL recommendation (Anonymous, 2008), based on human data calcium oxide is irritating to the respiratory system.

STOT – repeated exposure:

Toxicity of calcium via the oral route is addressed by upper intake levels (UL) for adults determined by the Scientific Committee on Food (SCF), being UL = 2500 mg/d, corresponding to 36 mg/kg bw/d (70 kg person) for calcium.

Toxicity of CaO via the dermal route is not considered as relevant in view of the anticipated insignificant absorption through skin and due to local irritation as the primary health effect (pH shift).

Toxicity of CaO via inhalation (local effect, irritation of mucous membranes) is addressed by an 8-h TWA determined by the Scientific Committee on Occupational Exposure Limits (SCOEL) of 1 mg/m³ fine fraction dust (see Section 8.1).

Aspiration hazard: Calcium oxide is not known to present an aspiration hazard.

12: ECOLOGICAL INFORMATION**12.1: Toxicity****12.1.1: Acute/Prolonged toxicity to fish:**

LC₅₀ (96h) for freshwater fish: 50.6 mg/l (calcium dihydroxide)

LC₅₀ (96h) for marine water fish: 457 mg/l (calcium dihydroxide)

12.1.2: Acute/Prolonged toxicity to aquatic invertebrates:

EC₅₀ (48h) for freshwater invertebrates: 49.1 mg/l (calcium dihydroxide)

LC₅₀ (96h) for marine water invertebrates: 158 mg/l (calcium dihydroxide)

12.1.3: Acute/Prolonged toxicity to aquatic plants:

EC₅₀ (72h) for freshwater algae: 184.57 mg/l (calcium dihydroxide)

NOEC (72h) for freshwater algae: 48 mg/l (calcium dihydroxide)

12.1.4: Toxicity to microorganisms e.g. bacteria:

At high concentration, through the rise of temperature and pH, calcium oxide is used for disinfection of sewage sludges.

12.1.5: Chronic toxicity to aquatic organisms:

NOEC (14d) for marine water invertebrates: 32 mg/l (calcium dihydroxide)

12.1.6: Toxicity to soil dwelling organisms:

EC 10/LC10 or NOEC for soil macroorganisms: 2000 mg/kg soil dw (calcium dihydroxide)

EC 10/LC10 or NOEC for soil microorganisms: 12000 mg/kg soil dw (calcium dihydroxide)

12.1.7: Toxicity to terrestrial plants:

NOEC (21d) for terrestrial plants: 1080 mg/kg (calcium dihydroxide)

12.1.8: General effect:

Acute pH effect. Although this product is useful to correct water acidity, an excess of more than 1 g/l may be harmful to aquatic life. pH value of > 12 will rapidly decrease as result of dilution and carbonation.

12.1.9: Further information:

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

12.2: Persistence and degradability

Not relevant for inorganic substance

12.3: Bioaccumulative potential

Not relevant for inorganic substance

12.4: Mobility in soils

Calcium oxide reacts with water and/or carbon dioxide to form respectively calcium dihydroxide and/or calcium carbonate, which are sparingly soluble, and presents 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

13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment:

Disposal of calcium oxide 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.

14: TRANSPORT INFORMATION

Calcium oxide is not classified as hazardous for transport (ADR (Road), RID (Rail), AND (inland waterways) and (IMDG (sea)). Calcium oxide is, however, classified as hazardous for air transport (ICAO/IATA).

14.1: UN No: UN 1910

14.2: UN Proper Shipping Name: Calcium Oxide

14.3: Transport Hazard classes: Class 8 (ICAO/IATA)

14.4: Packing Group: Group III (ICAO/IATA)

14.5: Environmental hazards: None

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

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: Calcium oxide is not a SEVESO substance, not an ozone-depleting substance and not a persistent organic pollutant.

National regulations: None

15.2: Chemical Safety Assessment

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

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: Revision

New format has been issued, all sections have been updated to include new information. Review SDS with care. This Safety Data Sheet was prepared in accordance with EC Regulation (EC) No. 1907/2006.

16.2: Abbreviations

EC ₅₀ :	median effective concentration
LC ₅₀ :	median lethal concentration
LD ₅₀ :	median lethal dose
NOEC:	no observable effect concentration
OEL:	occupational exposure limit
PBT:	persistent, bioaccumulative, toxic chemical
PNEC:	predicted no-effect concentration
SCOEL:	Scientific Committee on occupational exposure limits
STEL:	short-term exposure limit
TWA:	time weighted average
vPvB:	very persistent, very bioaccumulative chemical

16.3: 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

16.4: Relevant H- statements

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

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.

APPENDIX including Exposure Scenarios 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10, 9.11, 9.12, 9.13, 9.14, 9.15 and 9.16