## Material Safety Data Sheet

# Liquid Repair System (ER7)

**EU safety data sheet according to 91/155/EWG**

## SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

| | |
|---|---|
| **Product Name:** | Liquid Repair System - ER7. |
| **CAS No:** | N/A |
| **Product Use:** | ER7 is a two component repair system for sealing of cracks and porosity reduction of concrete based structures by means of biological in situ production of a calcium-based biomineral. |
| **MSDS Information:** | This product is classified as non-hazardous, according to EU directive 2000/54/EC |
| **Product Code:** | N/A |
| **Chemical Family:** | N/A |
| **Chemical Name/Synonyms:** | N/A |
| **Formula:** | This two component product in powder form consists of bacteria, bacterial spores, inorganic nutrient salts and carbohydrates as carbon-source for bacterial activity. Individual compositions of constituents in component "A" and "B" could vary within the ER7 application ranges. |
| **Supplier/Manufacturer:** | Basilisk-Contracting BV<br>Molengraaffsingel 10<br>2629 JD Delft,The Netherlands<br>T: +31 15 202 6128<br>E: info@basiliskconcrete.com<br>W: www.basiliskconcrete.com |
| **Emergency Contact:** | Supplier/Manufacturer |
| **REACH** | A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline. |

## SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

**Product Nature:** Concrete repair agent ER7 is a mix of substances as listed below with nonhazardous additions;

Prior to use, components ER7-A and ER7-B are dissolved in water (ER7-A 180 g/l and ER7-B 200 g/l) and applied in the ratio as indicated by the product application manual from supplier. This MSDS applies for both ER7-A/ER-7B powder compounds and applicable ER7 solutions in water.

**Hazardous Substance** None.

ER7 component A and component B have the following composition:

**Component ER7-A (powder):**

| Ingredient | CAS No. | Weight percentage of product (%) |
|---|---|---|
| Sodium Gluconate | 527-07-1 | 79.9 - 69.9 |
| Sodium Silicate (MR>3.2) | 1344-09-8 | 20 - 30 |
| Basilisk Basis B² * (contains limestone powder) | N/A (1317-65-3/ 546-93-0 /14808-60-7) | 0.1 |

**Component ER7-B (powder):**

| Ingredient | CAS No. | Weight percentage of product (%) |
|---|---|---|
| Calcium Acetate | 62-54-4 | 100 |

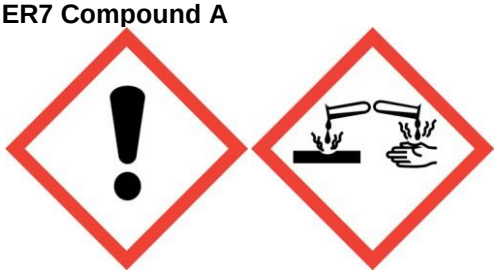
* Contains bacterial spores from alkaliphilic spore-forming Bacilli, classified as group 1 bacteria. Group 1 bacteria are considered not dangerous and nonpathogenic for humans as defined by the European Parliament (2000) Directive 2000/54/EC on the protection of workers from risks related to exposure to biological agents at work.

## SECTION 3 – HAZARDS IDENTIFICATION AND FIRST AID MEASURES

**Emergency Overview:**
Concrete repair agent ER7 (component A + B) contains compounds which are dangerous if swallowed, inhaled and upon contact with skin or eyes. Based on the bacterial strains present in the ER7 and strains used for spore production, this product is classified as non-hazardous, according to EU directive 2000/54/EC.

**Label elements. Label elements under CLP Pictograms**

**ER7 Compound A**



**ER7 Compound B**

**Signal words**: Warning - Danger (ER7-A), Warning (ER7-B)

**Hazard statements ER7-A**

H302 Harmful if swallowed, category 4.
H315 Causes skin irritation, category 2.
H318 Causes serious eye damage, category 2.
H335 May cause respiratory irritation, category 3.

**Hazard statements ER7-B**

H315 Causes skin irritation, category 2.
H319 Causes serious eye irritation, category 2
H335 May cause respiratory irritation, category 3.

**Other hazards**
**PBT**
This substance is not identified as a PBT substance.

**Potential Health Effects/Hazard statements ER7-A:**

| | |
|---|---|
| **Eye Contact:** | **H318** - Causes serious eye damage. |
| **Skin Contact:** | **H315** - Causes skin irritation. |
| **Inhalation:** | **H335** - May cause respiratory irritation. |
| **Ingestion:** | **H302** - Harmful if swallowed. |
| **Chronic Effects**: | No known significant effects. |

**Potential Health Effects/Hazard statements ER7-B:**

| | |
|---|---|
| **Eye Contact:** | **H319** - Causes serious eye irritation |
| **Skin Contact:** | **H315** - Causes skin irritation. |
| **Inhalation:** | **H335** - May cause respiratory irritation. |
| **Ingestion:** | No known significant effects. |
| **Chronic Effects**: | No known significant effects. |

## SECTION 4 – FIRST AID MEASURES

**Precautionary statements ER7-A**

| | |
|---|---|
| P261 | Avoid breathing dust/mist/spray. |
| P264 | Wash hands thoroughly after handling. |
| P270 | Do not eat, drink or smoke when using this product. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection (FFP3 class filter minimum). |
| P301 + P330 + P312 | IF SWALLOWED: rinse mouth. Call a poison center or doctor/physician if you feel unwell. |
| P302 + P352 (P321) | IF ON SKIN: Wash with plenty of soap and water. |
| P332 + P313 | If skin irritation occurs: Get medical advice/attention. |
| P362 | Wash contaminated clothing before reuse. |
| P304 + P340 + P312 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. |
| P305 + P351 + P338 + P310 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor/physician. |
| P405 | Store locked up. |
| P501 | Dispose of (undiluted) contents and container to hazardous or special waste collection point. |

**Precautionary statements ER7-B**

| | |
|---|---|
| P261 | Avoid breathing dust/mist/spray. |
| P264 | Wash hands thoroughly after handling. |
| P271 | Use only outdoors or in a well-ventilated area. |
| P280 | Wear protective gloves/protective clothing/eye protection/face protection (FFP3 class filter minimum). |
| P302 + P352 (P321) | IF ON SKIN: Wash with plenty of soap and water. |
| P332 + P313 | If skin irritation occurs: Get medical advice. |
| P362 | Wash contaminated clothing before reuse. |
| P304 + P340 + P312 | IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. |
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes; remove contact lenses, if present and easy to do; continue rinsing. |
| P337 + P313 | If eye irritation persists: Get medical advice/attention. |
| P405 | Store locked up. |
| P501 | Dispose of (undiluted) contents and container to hazardous or special waste collection point. |

**First aid measures**

| | |
|---|---|
| **General advice:** | Consult a physician. Show this safety data sheet to the doctor in attendance. |
| **Eye Contact:** | Immediately flush eyes thoroughly with water. Continue flushing for 15 minutes. Seek medical attention if eye irritation persists. |
| **Skin Contact:** | Wash skin with water and pH neutral soap or mild detergent intended for use on skin. Disinfect with alcohol. Get medical attention when skin irritation develops or persists. |
| **Inhalation:** | Immediately remove person to fresh air. If respiratory irritation remains or breathing becomes difficult, seek medical attention. |
| **Ingestion:** | If ER7 mixture enters the mouth, wash out with water immediately. Seek medical attention if any irritation sensation in the mouth or intestinal discomfort occurs. If ER7 is ingested, first rinse mouth, thereafter drink plenty of water to dilute ER7. Get medical advice whether or not evacuation of stomach or inducing of vomiting is necessary. |
| **Chronic Effects**: | If a respiratory allergy is developing over time, seek medical attention - contact a doctor/physician. |

**Advice to medical personnel:**

There could be a risk of inflammatory reaction of skin after contact, especially when contacted skin area contains open wounds.

## SECTION 5 – FIRE EXPLOSION DATA / FIRE FIGHTING MEASURES

| | |
|---|---|
| **Flammability:** | Not Flammable. |
| **Flash Point:** | N/A. |
| **Lower Explosive Limit:** | N/A. |
| **Upper Explosive Limit:** | N/A. |
| **Auto ignition Temperature:** | N/A. |
| **Sensitivity To Static Discharge:** | N/A. |
| **Sensitivity To Impact:** | N/A. |
| **Extinguishing Media:** | Water, (alcohol-resistant) foam, carbon dioxide, dry powder |
| **Special Fire-Fighting Procedures:** | None. |
| **Hazardous Combustion Products:** | None. |
| **Unusual Fire/ Explosion Hazards:** | None. |

## SECTION 6 – STABILITY AND REACTIVITY

**Stability:** Stable.

**Reactivity:** No possible reactions known.

**Hazardous Decomposition:** Will not occur.

**Hazardous Polymerization:** Will not occur.

**Incompatibility:** ER7 is a liquid which contains alkaliphilic bacteria, bacterial spores, nutrients, limestone and calcium acetate which react with water to produce a mild caustic solution, pH 8 to pH 10 (compatible with concrete). ER7 solution is mild to strong alkaline in its product state/application solution. As such it is incompatible with acids, ammonium salts, and aluminum metal. Aluminum powder and other alkali and alkaline earth elements can react under liberation of hydrogen gas in due to the strong alkaline conditions in concrete).

**Products evolved when subjected to heat or combustion:** Carbon dioxide, calcium oxide, water vapor**.**

## SECTION 7 – ACCIDENTAL RELEASE MEASURES

In case ER7 material is released or spilled, vacuum or brush and collect spilled material. Collect waste in suitable container and wash surface with water. Avoid high pressure rinsing or dispersion of ER7-A/B dust into the air. Maintain good housekeeping practices. ER7 constituents are bio-degradable and small spills may be discharged into sewer (apply proper dilution to prevent scaling/limestone precipitation in sewer works). Undiluted product should not be released to sewer works. Unused product should be disposed as chemical/biological waste in accordance with current local, state/provincial and federal regulations.

## SECTION 8 - HANDLING AND STORAGE

**Handling:** Avoid breathing ER7A/B powder or ER7 spray, preferably apply ER7-A/ER7-B solutions on surfaces by means of an airless paint sprayer (minimizing aerosol formation) or brush/paint roller if possible. Remove clothing which has been exposed or is wet from ER7 fluids and launder before reuse. Wash thoroughly after handling or exposure to ER7-A/B powder or fluids.

**Storage:** Store in original packaging, not opened, at temperatures between 0 to 40 °C.

## SECTION 9 - EXPOSURE CONTROLS AND PERSONAL PROTECTION

**Eye Protection:** Safety glasses with side shields, or goggles, should be worn when engaged in activities where ER7-A/B or application solution is used. If ER7 solution is applied by means of spraying, wear unvented or indirectly vented goggles to avoid eye irritation or injury.

**Skin Protection:** Avoid direct skin contact of ER7 powder or liquid. Do not allow contact of ER7 (powder or liquid) with skin for any period of time. Wear rubber gloves and watertight boots to eliminate skin contact with ER7 powder or liquid. If contact occurs, promptly wash affected area with soap and water. If prolonged exposure to ER7 powder or liquid might occur, wear impervious clothing. Do not rely on barrier creams; barrier creams should not be used in place of gloves! Periodically and at the end of a work day, wash areas that came in contact with ER7 powder or liquid with a pH-neutral soap. If irritation occurs, immediately wash the affected area and seek treatment. Clothing saturated ER7 liquid should be removed immediately and replaced with clean, dry clothing.

**Respiratory Protection:** Use a protective mask (FFP 3 grade according to EN 149: 2001) during the handling of ER7 powder or liquids. Upon prolonged exposure, application of ER7 liquids by spraying or dust formation during handling/mixing of ER7-A/B powder, exceeding of exposure limits in working area for dust (i.e. >5 - 10 mg particles/$m^3$ based on limestone content and/or >10.000 colony forming units (CFU)/$m^3$ air or >1.000 CFU of Gram-negative bacteria/$m^3$ air), an approved particulate respirator, or supplied air respirator, appropriate for the airborne concentrations should be used. Selection and use of the respiratory protective equipment must be in accordance with applicable regulations and good industrial hygiene practices. In addition, in confined spaces/working areas use local or general ventilation to control exposures to below applicable exposure limits.

## SECTION 10 - PHYSICAL AND CHEMICAL PROPERTIES

**Component A**

| | |
|---|---|
| **Appearance:** | Beige to light brown powder |
| **Odor:** | No distinct odor to slight damp (moist soil) odor |
| **Odor Threshold:** | N/A |
| **Physical State:** | N/A |
| **pH (as a solid):** | N/A |
| **pH in water:** | **8 - 9,5** |
| **Solubility In Water:** | N/A |
| **Vapor Pressure:** | N/A |
| **Vapor Density:** | N/A |
| **Boiling Point:** | N/A |
| **Freezing Point:** | N/A |
| **Melting Point:** | N/A |
| **Specific Gravity ($H_2O$ = 1.0):** | 0,9 – 1,0,5 |
| **Dust fraction** | < 0.5%. |
| **Evaporation Rate:** | not applicable |
| **O/W Coefficient:** | not applicable |

**Component B**

| | |
|---|---|
| **Appearance:** | Crystalline, whitish powder |
| **Odor:** | Slight acetic acid odor |
| **Odor Threshold:** | N/A |
| **Physical State:** | Solid (at 20°C) |
| **pH (as a solid):** | N/A |
| **pH in water:** | **5 - 7,0** |
| **Solubility In Water:** | 100 g/l (at 25°C) |
| **Vapor Pressure:** | N/A |
| **Vapor Density:** | N/A |
| **Boiling Point:** | N/A |
| **Freezing Point:** | N/A |
| **Melting Point:** | 160°C |
| **Specific Gravity ($H_2O$ = 1.0):** | N/A |
| **Dust fraction** | N/A |
| **Evaporation Rate:** | not applicable |
| **O/W Coefficient:** | not applicable |

## SECTION 11 - TOXICOLOGICAL INFORMATION

**ER7 combined product (compound A + B powder + application liquids)**

| | |
|---|---|
| **Acute Exposure:** | ER 7 can cause severe irritation or inflammation to skin, eyes and upper respiratory tract. Ingestion can cause irritation of the throat due the alkaline nature of ER7. |
| **Chronic Exposure:** | Pro-longed exposure to ER7 could cause inflammation/irritation of the tissue lining the interior of the nose and the cornea (white) of the eye. |
| **Remark:** | Pro-longed exposure by inhalation of limestone could cause cancer - but content of limestone in ER7 is <0,1% and therefore exposure to ER7 is not likely to result in cancer. |

**For ER7 (A/B-powder or liquid) no individual test results regarding toxicological data are available. The toxicological influences mentioned are deducted from ER7 constituents, physical properties and similar biological agents.**

**Individual toxicological information of compounds ≥0.1% content:**

**Sodium Gluconate**
**Toxicity to Animals:**

| | |
|---|---|
| Ingestion | LD0/i.v./rabbit = 7600 - 8700 mg/kg bw, LD50 rat: >2000 mg/kg bw. |
| Inhalation | No data available. |
| Skin Contact | No data available. |
| Eye Contact | Material may cause eye damage. |

**Effects on Humans:**

| | |
|---|---|
| Ingestion | May cause toxic effects if large amounts are swallowed. No effects known for accidental ingestion of small amounts. |
| Skin Contact | Material may cause irritation for susceptible individuals. |
| Eye Contact | Material can cause eye damage. |
| Inhalation | Long term inhalation of excessive dust may cause delayed lung injury. May cause respiratory irritation in susceptible individuals. |
| Chronic toxicity | No data available. |
| Human experience | Health injuries are not known or expected under normal use. |

**Sodium Silicate (MR>3.2)**
**Toxicity to Animals:**

| | |
|---|---|
| Ingestion | Oral LD50 (rat) 3400 mg/kg bw. |
| Inhalation | Inhalation LC50 (rat) >2.06 g/m³. NOAEL oral (rat) >159 mg/kg |
| bw/d. Skin Contact | Dermal LD50 (rat) >5000 mg/kg bw. |

**Effects on Humans:**

| | |
|---|---|
| Ingestion | All symptoms of acute toxicity are due to high alkalinity. Material will cause |
| irritation. Skin Contact | Material will cause irritation. |
| Eye Contact | Material will cause severe irritation. Risk of serious damage to eyes. |
| Inhalation | Dust is irritant to the respiratory tract. All symptoms of acute toxicity are due to high alkalinity. |
| Chronic toxicity | Not available. No evidence of genotoxicity. In vitro/in vivo negative. No structural alerts regarding carcinogenicity. |
| Human experience | Human experience confirms that irritation occurs when sodium silicates get on clothes at the collar, cuffs or other areas where abrasion may occur. |

**Basilisk Basis B² (limestone powder)**

**Toxicity to Animals:**

| | |
|---|---|
| Ingestion | Crystalline Silica: Oral Rate LD50 > 22,500 mg/kg bw. |
| Skin Contact | No data available. |
| Eye Contact | No data available. |
| Inhalation | No data available. |

**Effects on Humans:**

| | |
|---|---|
| Ingestion | No adverse effects expected for normal, incidental ingestion. If a large amount is swallowed, may cause gastrointestinal irritation, discomfort and blockage. |
| Skin Contact | Exposure to pulverized dust may cause dryness and irritation. This material is not known to cause sensitization. |
| Eye Contact | Exposure to pulverized dust may cause irritation. |
| Inhalation | Exposure to pulverized dust may cause irritation in nose, throat and lungs. |
| Chronic toxicity | This product contains trace amounts of crystalline silica. Prolonged or repeated inhalation of respirable crystalline silica can cause silicosis, as serious lung disease. This product is not listed as carcinogenic by OSHA, IARC, NTP, ACGIH, or the EU Directives. This product may contain trace amounts of crystalline silica quartz which is listed by IARC as “Carcinogenic to Humans” (Group1) and “Known to be a Human Carcinogen" by NTP. |
| Human experience | - |

**Calcium Acetate**

**Toxicity to Animals:**

| | |
|---|---|
| Ingestion | Oral Rat LD50 2.700 mg/kg bw. |
| Skin Contact | N/A. |
| Eye Contact | N/A. |
| Inhalation | Did not cause sensitization on laboratory animals. |

**Effects on Humans:**

| | |
|---|---|
| Ingestion | Based on available data, the classification criteria are not met. |
| Skin Contact | Causes skin irritation. |
| Eye Contact | Causes serious eye irritation. |
| Inhalation | May cause respiratory irritation. |
| Chronic toxicity | Not available. |
| Human experience | N/A. |

## SECTION 12 - ECOLOGICAL INFORMATION

**Ecotoxicity:** ER7 material is considered to be harmless for the environment since ER7 does not contain dangerous substances. ER7 is not recognized for unusual toxicity to plants or animals based on available toxicity data on individual compounds. Any negative environmental effect could be related to the alkaline nature of the product.

**Remark:** **For ER7, no product ecotoxicity test results are available.**

**Individual toxicological information of compounds ≥0.1% content:**

**Sodium Gluconate**

| | |
|---|---|
| Mobility | Completely soluble. |
| Persistence and degradability | Chemical oxygen demand (COD) = 807 mg O2/g.<br>Biochemical oxygen demand within 5 days (BOD5) = 507 mgO2/g.<br>DIN EN 29888 (OECD 302B) Readily biodegradable (98% after 2 days). |
| Bioaccumulation | No data available. |
| Ecotoxicity effects | Toxicity to fish = LD50 >10.000 mg/l, toxicity to bacteria = EC0 >5.000 mg/l. |

**Sodium Silicate (MR>3.2)**

| | |
|---|---|
| Mobility | Inorganic. Completely soluble. |
| Persistence and degradability | Inorganic. Soluble silicates, upon dilution, rapidly depolymerize into molecular species indistinguishable from natural dissolved silica. |
| Bioaccumulation | Inorganic. The substance has no potential for bioaccumulation. |
| Ecotoxicity effects | Toxicity to fish = LD50 1.108 mg/l, toxicity to aquatic invertebrates (Daphnia)= EC50 1.700 mg/l. |

**Basilisk Basis B² (limestone powder)**

| | |
|---|---|
| Mobility | Inorganic. Slightly soluble in water. |
| Persistence and degradability | Inorganic. Upon dilution, rapidly decomposes into compounds indistinguishable from natural dissolved magnesium, calcium and silica. |
| Bioaccumulation | Inorganic. This material shows no bioaccumulation effect or food chain concentration toxicity. |
| Ecotoxicity effects | Because of the elevated pH of this product, it might be expected to produce some ecotoxicity upon exposure to certain aquatic organisms and aquatic systems in high concentrations. |

**Calcium Acetate Hydrate**

| | |
|---|---|
| Mobility | N/A. |
| Persistence and degradability | Biodegradable. |
| Bioaccumulation | N/A. |
| Ecotoxicity effects | Toxicity to fish = LC50 1.000 mg/l, toxicity to aquatic invertebrates (Daphnia)= EC50 919 mg/l. |

## SECTION 13 - DISPOSAL CONSIDERATIONS

Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

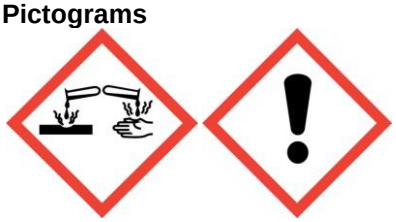
Dispose of waste material according to local, provincial, state, and federal regulations.

Contact a licensed waste disposal company. Dispose of this material and its container to hazardous or special waste collection point. Do not allow undiluted product to reach sewage system.

## SECTION 14 - TRANSPORT INFORMATION

| | |
|---|---|
| **Hazardous materials description** | ER7 component A is not hazardous under EU regulations. |
| **Hazard Class:** | IATA: not classified.<br>ADR: not classified.<br>IMO: not classified. |
| **Identification Number:** | Not applicable. |
| **Required Label Text:** | Warning, danger. |

**Label elements. Label elements under CLP**
**Pictograms**



| | |
|---|---|
| **Hazardous materials description** | ER7 component B is not hazardous under EU regulations. |
| **Hazard Class:** | IATA: not classified.<br>ADR: not classified.<br>IMO: not classified. |
| **Identification Number:** | Not applicable. |
| **Required Label Text:** | Warning. |

**Label elements. Label elements under CLP**
**Pictograms**

## SECTION 15 - REGULATORY INFORMATION

**Safety, health and environmental regulations/legislation specific for the substance or mixture**
Not applicable.

**Chemical Safety Assessment**
A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

## SECTION 16 - OTHER INFORMATION

**Approval Date or Revision Date:** **13-09-2018**
**Date Of Previous MSDS:** **22-03-2017**
**MSDS Number:** **Not applicable**

ER7 is a two component concrete repairing agent to be used after dissolution powder components Er7-A and ER7-B) in water as means of concrete repair in structural and civil engineering. This product provides self-healing and repairing capabilities to concrete structures by use of bacteria and bacterial spores of alkaliphilic bacteria. After application a gel is formed in which the concrete healing bacteria produce limestone/calcium carbonate, resulting in crack repair.

While the information provided in this Material Safety Data Sheet (MSDS) is believed to provide a useful summary of the potential hazards of ER7 (ready to use product, ER7 compound A, ER7, compound B), one cannot anticipate and provide all of the information that might be needed in every situation.

The data listed in this MSDS does not address hazards that may be posed by other materials mixed with ER7. Users of ER7 and mix products should review other relevant material safety data sheets before working with ER7.

The information contained in this MSDS is based on the data available to us at this time, and is believed to be accurate based upon that data. The information herein is given in good faith but no warranty expressed or implied, is made. No representations or warranties with respect to the accuracy or correctness of this information, or of any kind or nature whatsoever are given, made, or intended by Basilisk-Contracting. No legal responsibility whatsoever is assumed for this information, or for any injuries or damages, however caused, which may result from the use of this information. The information contained in this MSDS is offered solely for informational purposes and is subject to your own independent investigation and verification.