



# Building

Substrates and bulk materials  
for structural and civil engineering



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# Achievable challenges with buildings

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Where excavators and wheel loaders reach their limits, with turbo lift power you can achieve high blow counts for backfills of all kinds. With our turbo lift you can use a 150 meters long hose line to transport materials to the most inaccessible places, whether they be noise protection walls, building hollows, tanks, basements or cavities.

The maximum bridgeable distance using the turbo lift vehicles depends on the raw material, the grain, and the moisture content. Available backfill materials include lava, basalt, limestone grit, gravel, pumice, porphyry or expanded clay in grain sizes of up to 25 mm.

The use of a 8–16 mm grain size ensures good drainage of seepage and layer water. EV2 values of 85-100 MPa/m<sup>2</sup> must be achieved for this. With a minimum use of personnel (2–3 construction assistants) and added assistance from our turbo lift driver, 26 t can be filled within 1–1.5 hours. This corresponds, for example, to a volume of up to 21 m<sup>3</sup> with lava grain sizes of 8–16 mm. With backfills consisting of Lavadrän and KF-values of 2.7 m/s, load capacities of up to 95 MN/m<sup>2</sup> can be achieved.

# Basalt

**Colour\*:**

grey (dry),  
anthracite (wet)



	Sand	Grit
<b>Grain size</b> (ø in mm)	0-3	2-5
	0-16	8-16
<b>Weight, installed</b> (t/m <sup>3</sup> )	1.80-2.20	1.4-1.70

# Gravel

**Colour\*:**

light grey-yellow with brown  
and anthracite-coloured  
components



	Sand	Grit
<b>Grain size</b> (ø in mm)	0 - 2	2-8
	0-16	8-16
<b>Weight, installed</b> (t/m <sup>3</sup> )	1.80-2.20	1.5-1.80

# Lava

**Colour\*:**

from light-reddish brown  
through dark-reddish brown  
to anthracite colours



	Sand	Grit	
<b>Grain size</b> (ø in mm)	0-3	1-5	2-8
	0-16	2-16	8-16
<b>Weight, installed</b> (t/m <sup>3</sup> )	1.65-1.90	1.2-1.40	

# Porphyr

**Colour\*:**

grey brown to reddish brown



	Sand	Grit	
<b>Grain size</b> (ø in mm)	0-16	2-5	2-8
		2-26	8-16
<b>Weight, installed</b> (t/m <sup>3</sup> )	1.80-2.20	1.50-1.80	

\* Since it is a natural product, colour deviations may occur.



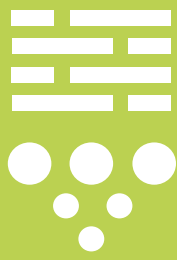
## Regional raw materials

Certain raw materials and grains are only regionally available. We will be happy to inform of the backfill materials that can be supplied in your region.

**You can find your local contact directly on page 18,  
or allow us to advise you under:**

+49 2632 9548-0 | info@vulkatec.de | www.vulkatec.de





# Infiltration trenches

## Vitalised soils that prevent overflowing

Severe rain events in recent years have been getting worse and worse. Channels are no longer able to dissipate the water masses in a controlled way. This often leads to damage ranging from flooded cellars to flood ravaged streets.

One approach has been to retain the water in site. For this purpose, in addition to roof greening, that completely retains the water or dissipates it over time to the channel, other options are cisterns or infiltration trenches.

Infiltration trenches usually constitute a coarse-grained rock-filled cavity for receiving the water and a covering layer consisting of a vitalised soil zone. This is laid as a pit so that the water can be absorbed temporarily. As a result of the settling of a biofilm, in addition to a purely mechanical cleaning, a biological cleaning also takes place as the water flows through the vitalised soil zone. The lava and pumice materials used are ideal for this.

In combination with loess-soil and RAL quality assured compost, a good cultivation base is established for greening with grass, reeds and sedges.



# Vulkaterra® lawn 0-6/8

Mineral-organic substrate for grassed areas and infiltration systems.

**Details:**

- The base components are loess, lava, pumice, sand, compost, with additives of peat and fertilizer if requested
- The mixture has a porous structure, with a high total pore volume, and is pressure-resistant and stable over the long-term
- The substrate has good nutrient buffering, is pH-stable, and is germination and growth promoting
- Free of root-forming weeds
- Can be used after a short time even after prolonged or heavy rainfall
- A KF value of at least 10-4 m/s is ideal for the greening of infiltration systems
- Produced in accordance with the stipulations of the FLL guideline and the Fertilizer Ordinance in its current version

**Design:**

Drainable substrate for infiltration systems, landscaping grass, substrate

**Composition:**

Natural product; Eruptive stone mixture, consisting of augite, olivine, magnetite, limonite, biotite, clays of various types, enriched with compost

**Application areas:**

- Lawn seeding on green areas, inner courtyards and roof areas
- Vitalised soil layer for use with infiltration systems

**Additional information:**

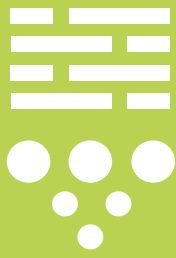
- Certificates
- Product data sheets
- installation introduction

This additional material is available for download at:

[www.vulkatec.de](http://www.vulkatec.de)

<b>Grain size</b> (ø in mm)	
<b>Particle size distribution</b> (percentage of total mass in %)	
Blowable components	10-20
Fine / medium gravel	20-40
<b>Volume weight</b> (t/m³)	
Delivery condition DIN EN 1097-3	1.00-1.10
At max. water capacity, compacted	1.60-1.85
<b>Water/air balance, compacted</b>	
Maximum water capacity	40-50 vol. %
Water permeability mod. K <sub>f</sub>	1.0-10 mm/min
<b>pH value</b>	6.8-7.5
<b>Salinity</b>	0.5-1.5 g/l





# Soil filter

**Clean water through natural filtration**

A soil filter for the cleaning of surface wastewater typically consists of a sedimentation basin and a vegetated filter tank. In the filter tanks, the water previously cleaned of floating particles, fats and oils is then biologically clarified. During this process the water is deprived of pollutants before it seeps into the ground or is led away by flowing water.

Many years of experience acquired from the operation of sewage plants can be resorted to. Vulkatec relies on the tried-and-tested raw materials lava and pumice, since they are ideal for establishing the important biofilms that are needed.



# Vulkasoil® 0-2

Bulk material mixture for retention soil filters.

**Details:**

- Good permeability also when compacted
- High potential to absorb pollutants
- Mineral buffer system
- High biological activity
- Excellent structural stability
- Segregation-resistant composition
- Simple technical handling
- Corresponds to the requirements of the planning guidebook NRW-retention soil filter

**Application areas:**

- Precipitation drainage in the mixing and separation system
- Retention soil filter

**Additional information:**

- Certificates
- Product data sheets

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<b>Grain size</b> (ø in mm)	
<b>Particle size distribution</b> (percentage of total mass in %)	
Blowable components	0.5
Fine sand	25
Medium sand	50
Coarse sand	0.5
Fine gravel	0.0
Content of organic matter	0.0
Content of carbonate (separation system)	10
Content of carbonate (mixed system)	25
<b>Bulk weight according to DIN 4226</b>	1.10 g/cm <sup>3</sup>
<b>Permeability coefficient</b>	1.5x10 <sup>-4</sup> m/s
<b>pH value (CaCl<sub>2</sub>)</b>	7.7
<b>Adsorption capacity</b>	20 mmol eq/l







# Vulkasoil® 0-5

Bulk material mixture for soil filter.

## Details:

- Excellent structural stability
- Segregation-resistant composition
- Good permeability even when strongly compacted
- Good adsorption potential for pollutants
- Carbonate based buffer system
- High biological activity
- Simple handling
- Fixes inorganic pollutants
- Binds and degrades organic pollutants
- Has the potential to regenerate due to the degradation of pollutants
- Consistent composition
- No on-site mixing necessary

## Application areas:

- Rainfall runoff drains in the mixing system
- Rainfall runoff drains on roads
- Rainfall runoff drains in the separation system
- Soil filter

## Additional information:

- Certificates
- Product data sheets

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### Grain size ( $\phi$ in mm)

0-5

### Particle size distribution

(percentage of total mass in %)

Blowable components	6
Medium/Fine Gravel	50
Medium/Fine Gravel	0.0

### Proctor density

2.01 g/cm<sup>3</sup>

### Water content at proctor density

(percentage of total mass in %)

26

### Bulk weight according to DIN 4226

1.10 g/cm<sup>3</sup>

### Permeability coefficient

3x10<sup>-4</sup> m/s

### pH value (CaCl<sub>2</sub>)

7.7

### Adsorption capacity

20 mmol eq/l



# References



Roof



Lawn



Tree



Farm

## Soil filter

The water previously cleaned of floating particles, fats and oils is biologically clarified in the filter basin.



Tub



Interior



## Space and cavity backfills

even at the most inaccessible places such as a building hollow due to the up to 150 metre long hose line from our turbo lift vehicle.



Pond



Building



# Industrial products



## Grinding and polishing medium

Powder and filler based purely on minerals can be found in many areas of everyday life. They affect the coating and flow behaviour of paints and promote the effect of cleaning agents. Using various grades of pumice, Vulkatec produces customer-specific grain distributions from eco-friendly and natural raw materials for detergents, cosmetics and the dental industry.



## Foundry

To prevent the formation of voids in cast blanks, additional chambers are attached to the mould, which initially serve to accommodate the liquid metal during the casting process before it is fed back to the actual mould at the onset of solidification. The feeders consist of a versatile material mixture. Dried and mineralised pumice material from Vulkatec is one component in this material blend.



## Lava grill stones

A uniform heat distribution, absorption of excess fat and gravy - these are the benefits that barbecue lovers from all over the world enjoy with their LAVA grill. Vulkatec has been producing and distributing volcanic rocks for original equipment or replacement material for over 30 years now. In a special procedure, the lava is gently heated to approx. 180°C at which it is kept for a certain period of time. This causes the water trapped in the pores to escape, thereby preventing the stones from breaking when they finally reach the end customer. Depending on the customer's wishes, the lava can be delivered in sales-ready PE bags or in custom printed cardboard boxes.

Source: DynaSand filter from Nordic Water/Water



## Filling material for environmental technology

With precisely-tuned grain distributions and basalt, lava and pumice grains freed of impurities, Vulkatec produces and delivers filling materials for filters, exhaust scrubbers, as well as support materials for catalytic converters and trickling water treatment plants. Depending on how it is used, the material can be time- and cost-effectively injected directly into the container from our own silo trucks.



## Acoustic protection gabions

The gabion wall has been growing in acceptance over the last few years as a decorative and functional structural element both in residential areas and public spaces. Layered basalt lava Vulkapor® in wire baskets provides supportive, cladding and sound-absorbing functions. The construction and design of the wire baskets varies depending on the application. Vulkapor® is frost and weathering resistant in accordance with TL Gab-Stb 16 (requirements, such as TL Gab-By), as well as frost and road salt resistant in accordance with DIN EN 1367-6 in conjunction with the MIRO leaflet "mineral filler materials for stone baskets", 1st Edition 2011.



## Lightweight stone aggregate

The lightweight stone aggregates from Vulkatec are used in facade renders, lightweight and fire-resistant mortars, tile adhesives and as a certified lightweight stone aggregate in concrete. The cantilevered roof construction of the tram-stop at Berlin Central Station was only made possible through the use of our Vulkamix F0/3 aggregate. As a purely mineral aggregate, Vulkamix also presents no problems with any subsequent recycling.

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### Information and Technical Data

Your contact person for questions about volcanic raw materials for use in industry:

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Product Management for Industrial Products

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