

WE CREATE NEW
IN HARMONY WITH NATURE



**BUILDING • ROAD BUILDING • HORTICULTURE
GEOTECHNICAL ENGINEERING**

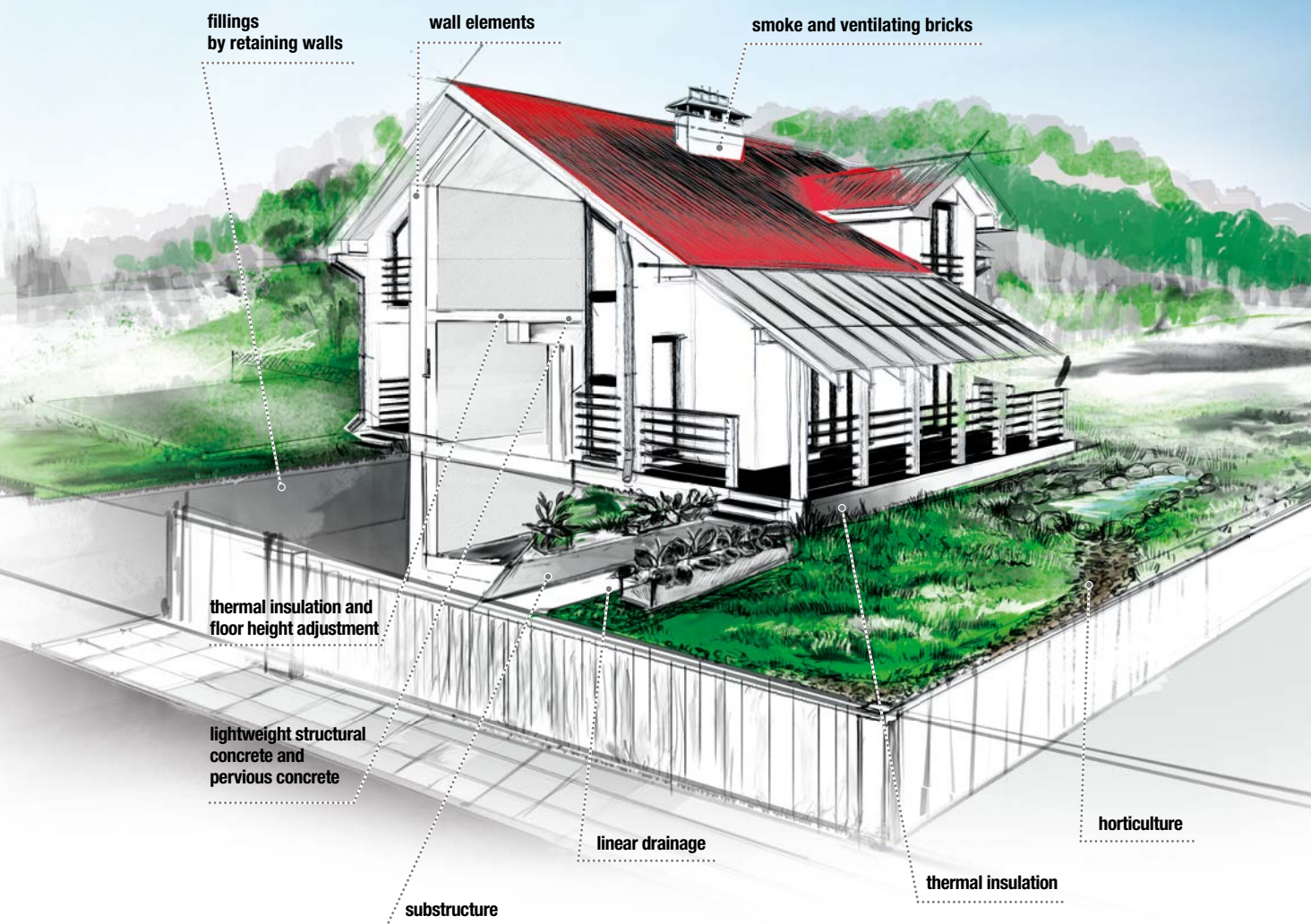
CERTYD is a durable, lightweight and high-strength material. It is environmentally sound and safe material used in building, road building and horticulture. It is produced as a result of a sintering process in a uniquely designed rotary furnace. The technology of manufacturing of CERTYD is also environmentally sound. The worldwide innovative technical solutions that we implement are patent-protected.

On account of its technical parameters, CERTYD can compete with natural products. It can be used much more extensively than natural aggregates, its advantage being weight – it is much lighter than traditional aggregates. The bulk density, depending on the product fraction, oscillates between 550-830 kg/m³.

The CERTYD characteristics and properties comply with light-weight aggregate standards (e.g. PN-EN 13055-1 Lightweight aggregates for concrete, mortar and grout, PN-EN 13055-2 Lightweight aggregates for bituminous mixtures and surface treatments and for unbound and bound applications).

Product application

Aggregate properties	Natural aggregate	Synthetic aggregate	
		Expanded clay	Certyd®
Bulk density [kg/m³]	1260 - 2600	250 - 750	620 - 750
Resistance to crushing [MPa]	20 - 120	1,0	7,0 - 9,0
Thermal conductivity coefficient [W/m·K]	1,73 - 3,98	0,13 - 0,16	0,14 - 0,16
Possible floating	no	yes	no
Max concrete strength [MPa]	120	20	75
Aggregate application	Natural aggregate	Synthetic aggregate	
		Expanded clay	Certyd®
Lightweight structural concrete (up to LC60/66)			+
Lightweight concrete (up to LC16/18)		+	+
Structural concrete (up to C60/75)	+		+
Lightweight structural precast concrete elements			+
Lightweight precast concrete elements		+	+
Structural precast concrete elements	+		+
Heat-insulating concrete		+	+
Fire-resistant concrete	+		+
Pervious concrete	+	+	+
Road building	+	+	+
Geotechnical engineering	+	+	+
Drainage layers	+	+	+
Thermal insulation layers		+	+
Hydroponic cultivation substrates		+	+
Insulation on the ground and ceiling		+	+
Warm floors and industrial floors	+	+	+



The CERTYD aggregate is

- porous, lightweight and **durable**
- **resistant** to fungi, mould, rodents and insects
- chemically neutral, and thus **safe for humans and the environment**
- entirely **freezing and thawing and fire resistant**,
- with excellent **heat and sound insulation**
- **non-degradable**, suitable for reuse
- **vapour-permeable**

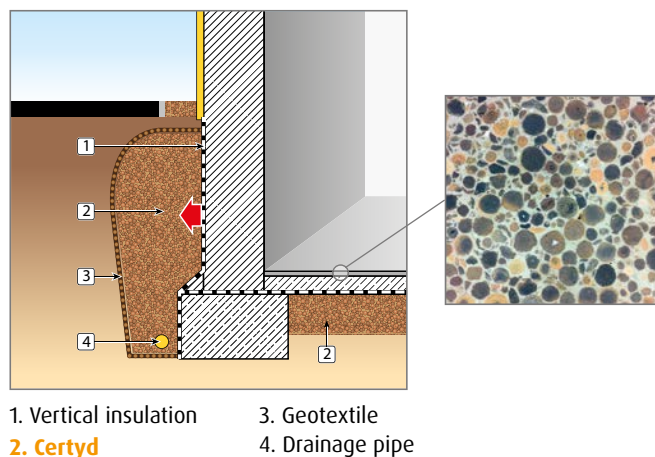
Walls and floors made of CERTYD materials have a high thermo-insulating performance, and perfectly protect against frost, heat and noise. They are characterised by excellent vapour-permeability parameters, which prevents dampness in buildings. All these features together make building products with our aggregate excellent building blocks and having a wide spectrum of applications.

1. Lightweight structural concretes

CERTYD aggregate is an excellent alternative to clay-porite aggregate, granulated slag and metallurgical pumice, as one of the main components of lightweight structural concretes. With a bulk density of 620-900 kg/m³, it is possible to easily obtain lightweight concretes weighing from 1600 kg/m³ (whereas the weight of concretes with natural aggregates is usually in the range of 2400-2800 kg/m³). It is the only aggregate on the market that can be used to produce lightweight, high-strength concrete. It is also possible to obtain high-strength concretes (above 60 MPa).

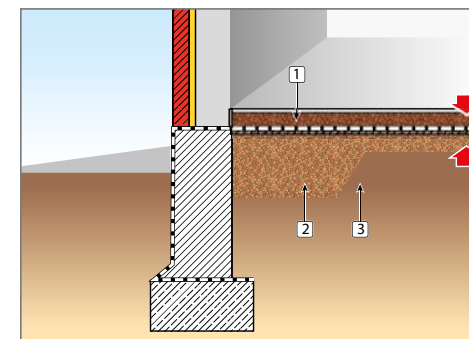
In addition to the advantage of weight, CERTYD also has excellent thermal insulation parameters. Our aggregate is resistant to both low and high temperatures. It is also more resistant to micro-cracking.

The **CERTYD aggregate** is used for the production of such building materials as: chimney blocks, ventilating blocks, Alfa blocks, Teriva blocks, gazons, palisades, foundation blocks, headers.

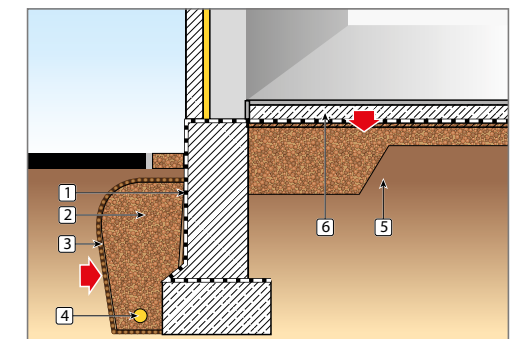


2. Thermally and acoustically insulating concretes

On account of a favourable thermal conductivity coefficient, absolute resistance to freezing and thawing, and the resistance to fungi, mould and pests, the heat and sound insulation of the CERTYD aggregate is an alternative for insulations made of foamed polystyrene or mineral wool. Our aggregate is well-suited as thermal insulation in cellar and foundation walls. On account of a porous structure it may be used in spaces under the floor and inside walls. Due to the properties of the aggregate and the hollowness inside, CERTYD hollow bricks have perfect thermal properties. Our aggregate, as well as prefabricated materials made of it have excellent heat and sound insulation properties. The use of durable building materials made of our aggregate will effectively protect the interior from noise.



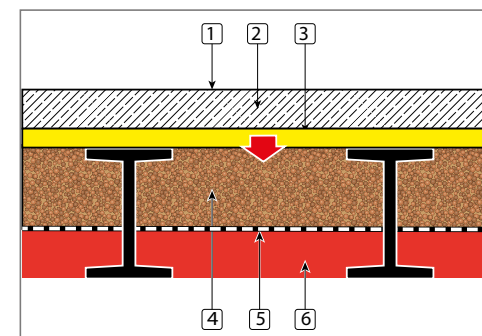
1. Vertical insulation 2. Certyd
3. Ground base



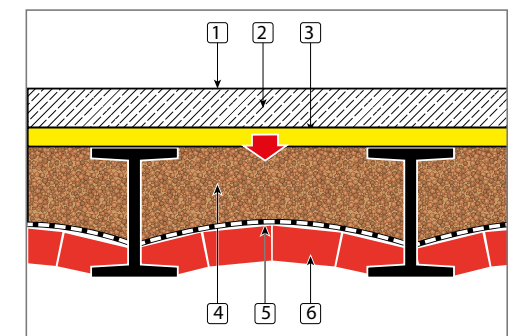
1. Vertical insulation 4. Drainage pipe
2. Certyd 5. Ground base
3. Geotextile 6. Warm light concrete

3. Lightening and levelling the floor

CERTYD can be used to level the floor and makes an excellent alternative for wool and foamed polystyrene. Being resistant to fungi, mould or rodents it may be used in old (e.g. historical) buildings. With the application of CERTYD, the weight of the floor is significantly reduced, which allows the floor to be loaded further and ensures its safe use.



1. Floor 4. Certyd
2. Cement screed 5. Vapour barrier
3. Sound insulation 6. Brick floor plate



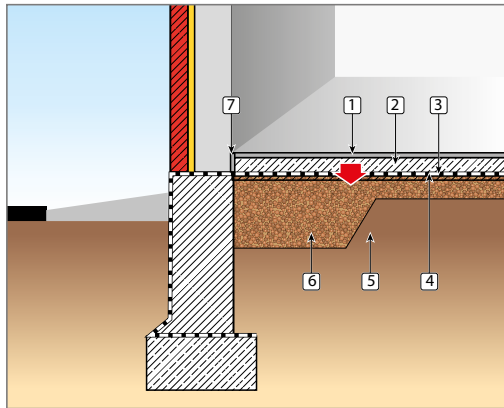
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The basic properties of CERTYD

	STANDARD	0-2	1-4	4-10
Bulk density [kg/m ³]	EN 1097-3:2000	900±10%	620±10%	700±10%
Resistance to crushing [N/mm ²]	EN 13055-1:2003, A	–	> 6,0	
Thermal conductivity coefficient [W/m·K]	EN 12667:2002	–	0,16	0,14
Absorbability after 24 hours [%]	EN 1097-6:2002, C	–	–	20
Frost resistance [%]	EN 13055-1:2003, C	–	–	1

4. Floors on the ground

A traditional floor on the ground is made up of six layers: concrete base, concrete screed, insulation against moisture, sand bed and foamed polystyrene. As the CERTYD aggregate can spread uniformly, also on uneven ground, its one layer may replace three traditional layers (sand bed, concrete base and heat insulation).



1. Floor
2. Cement screed
3. Horizontal insulation
4. Cement spraying
5. Ground base
6. Certyd
7. Circumferential expansion joint

5. Green roofs

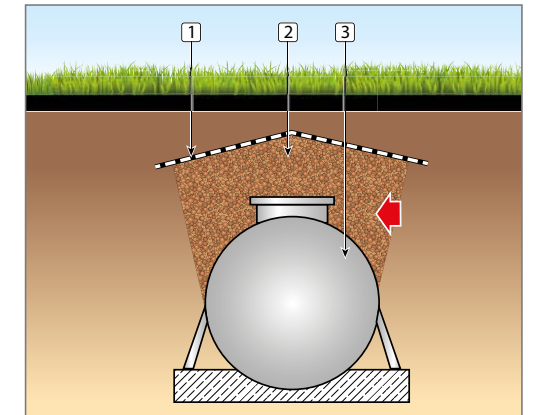
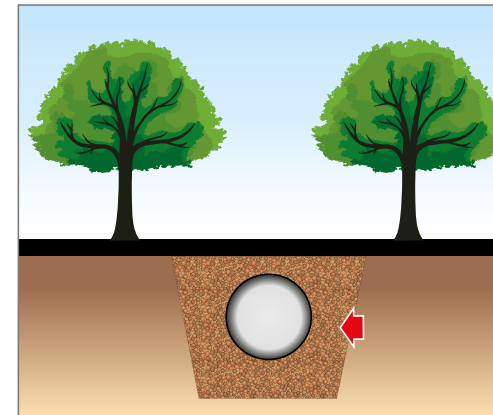
Green roofs are becoming an increasingly popular solution in a modern construction. They may provide additional green spaces in the places that so far have not been used. Construction materials for green roofs must be lightweight, they should discharge runoff water well and have a good heat insulation. The CERTYD aggregate meets all of these requirements. It is an excellent heat insulator on account of its properties, and makes a perfect drainage layer. Additionally, it opens the soil when mixed with it and ensures better accessibility of air and water to the plants' root system and lightens the floor weight.



CERTYD is suitable for the use in geotechnical engineering. It may be used for road building on low bearing grounds, or on grounds with non-uniform layering. It may play the filtering role in drainage and be used for building football pitches or playgrounds.

1. Pipeline insulation

The **CERTYD aggregate** is suitable for the construction of pipelines or other underground installations. When laying the pipeline it is important to remember it should be laid permanently and secured against the effects of outside factors. Our aggregate plays both of these roles: it is an excellent substrate of adequate load bearing, as well as a heat insulation. Strewing pipes and insulation with CERTYD prevents freezing of installations and pipe breakages. Moreover, when the pipeline is being laid on the ground of low load bearing, CERTYD lowers the pressure on the ground and enables an even settlement of the installation.



1. Foil
2. Certyd
3. Reservoir

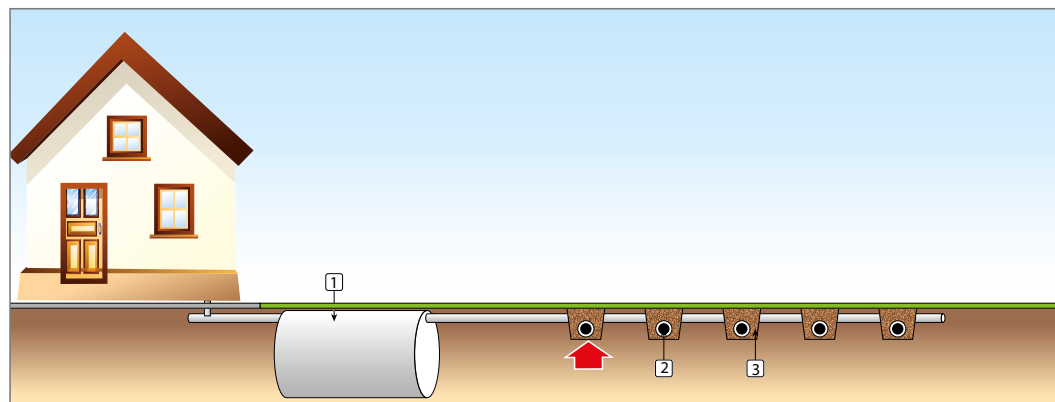
2. Sports facilities

The **CERTYD aggregate** is perfect for such sports facilities as stadium pitches or playgrounds. One of the most common issues on large areas is an uneven settlement of the ground caused by rain. This happens as the ground is compacted by precipitation water, which causes the non-uniform permeable surface to subside. If a layer of our aggregate is placed under the pitch, the drainage of precipitation water on the entire surface is greatly improved. This prevents the settlement of the ground. Furthermore, with an adequate water-air regulation, the ground retains optimum moisture levels and the grass does not dry up too quickly.



3. Small-scale waste water treatment plants

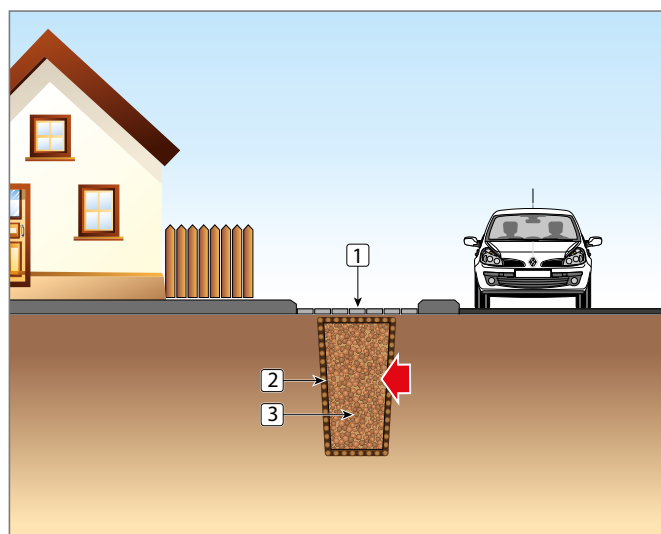
On account of its permeability CERTYD may be used as a drainage layer in small-scale waste water treatment plants. The bio-membrane that develops on the layer of a coarse and porous aggregate is an effective neutralising agent for sewage bacteria.



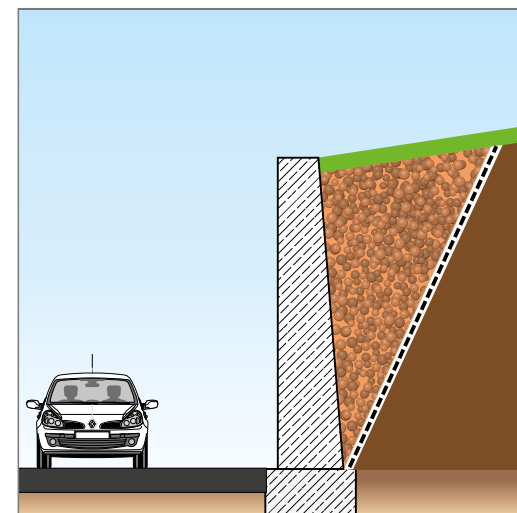
1. Treatment plant reservoir 2. Leach pipes 3. Certyd

4. Drainage line

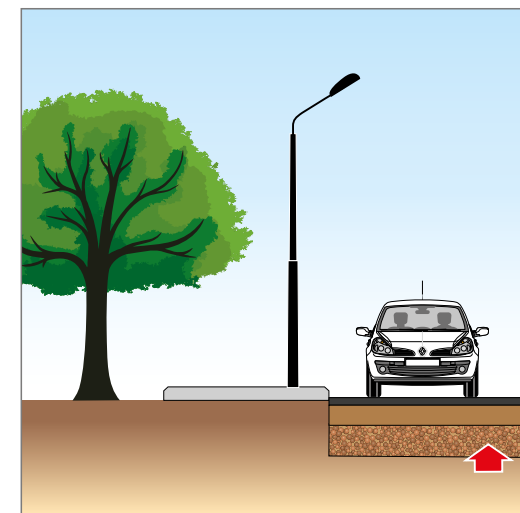
The CERTYD linear drainage is well suited for filling road ditches with the method of the so-called 'French drain'. It is an alternative for traditional road ditches. In such systems the ditch is filled with aggregate, insulated by means of geo-textile, and the lot is covered with a layer of permeable soil. Such drainage is resistant to silting up, clogging, and cracks, and it additionally reduces the transmission of vibrations from traffic routes. More importantly, it can last for dozens of years. Furthermore, this solution is much safer for the drivers as downgrades and dangerous concrete culverts are eliminated from the road.



1. Openwork pavement surface
2. Geotextile
3. Certyd



Retaining wall



Substructure under a traffic route

5. Road and railway embankments

The aggregate is widely used for securing hard shoulders and slopes of transportation routes. When we are faced with weak and loose ground, they should be replaced with environmentally-neutral CERTYD. Then the ground will be properly loaded and evenly spread. The application of the aggregate will strengthen road embankments and secure them against water and wind erosion. The substructure made of our aggregate ensures proper mechanical durability of roads.



CERTYD is perfect for perennial cultivations as well as for mulching and ballast. It is well suited for the cultivation of ornamental plants in boxes, buckets, foil sleeves, as well as an additive for field and pot cultivation (outdoor and traditional). It may be used for filling forms or landscaping (hills, slopes, embankments, uneven areas, etc.). Its low weight does not cause the ground to settle and its structure enables a freeform combination of the elements of embankments or other constructions.

1. Drainage of potted plants

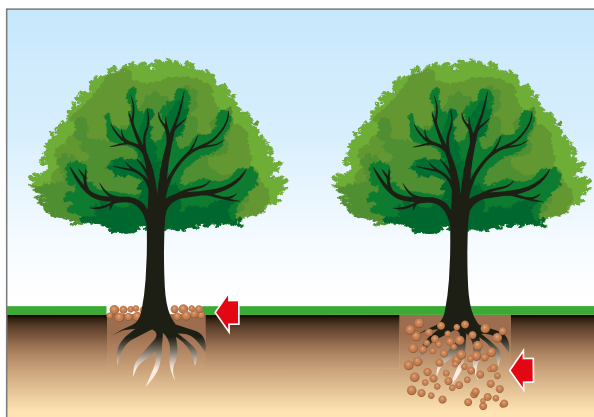
CERTYD can be used as a drainage layer for ornamental plants in boxes, buckets, foil sleeves, as well as in outdoor cultivation.

A layer of CERTYD should be spread in a pot up to about 1/3 of the vessel, and the remaining space should be filled with soil. When watering, the pot should be filled up to 1/4 of its volume.



2. Loosening of arable soil

If arable soil is too compact it can be mixed with CERTYD. The addition of this aggregate will make the soil loose and ensure a better accessibility of air and water to the root system of the plant. Additionally, the used aggregate prevents the collection of water excess – it cumulates and releases water.



3. Soilless cultivation (hydroponic)

The cultivation requires seedlings that have not had contact with the soil before, or very young plants that have so far grown in soil. Before the plant that has been in soil is planted, its root system should be cleaned, and then it should be placed inside a pot completely filled with CERTYD. It is also useful to place a water level indicator inside the pot to see when the plant should be watered.



4. Ballast under the plants

The CERTYD ballast is perfect for mulching the area around the plants. It replaces non-durable bark chippings. Before using CERTYD, a 5-10 cm layer of soil should be removed. Our aggregate should be used to fill such prepared space. On account of its lightweight it must be surrounded with higher edges. The layer of CERTYD prevents growing weeds and vaporisation. Besides, it regulates fluctuations in water temperature and prevents freezing. Its aesthetic qualities cannot be underestimated either - its brown hue provides a good contrast with green. It may be used as a decorative element in a garden architecture.





About company

LSA is an innovative company which makes highly durable CERTYD construction aggregates. The uniqueness of the company is shown through its proprietary technology of aggregate production. The process is safe for the environment and generates no wastes. The product is a result of 15 years of research by a scientific team. **Our solutions are internationally patent-protected.**

The LSA manufacturing facility is completely automated. It can be managed by only four workers on one shift. The company has its own laboratory, as well as a research and development department. It is there that new, innovative solutions, which are later patented, are developed.

CERTYD can be a substitute for natural aggregates such as gravel and sand the obtaining of which involves environmental degradation. By comparison, CERTYD is much lighter, warmer and better at reducing noise levels. It is environmentally neutral, safe for humans and animals, resistant to frost and fire. It does not lose its properties with time. If it was used loose then it can be collected and reused.

It has a variety of applications. Until now its widest application was in building, road building and horticulture.





lightweight sintered aggregate

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