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Leca® A Saint-Gobain brand

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Leca®

Floating protective cover solution for Slurry Tanks and Lagoons



Reduce up to 85%
of Ammonia,
Hydrogen
Sulphide (H₂S)
and Methane
Emissions with
Leca® Aerotop

LECA® AEROTOP

- Pneumatic Delivery
- Retention of Nitrogen
- Cost effective



Leca® Aerotop is a good solution

The right combination of measures for rain and storm water management will reduce the runoff during rain storms to detain and alleviate pressure on the sewage system.

Leca® Aerotop is an innovative ceramic bulk material that can be added to the surface on a slurry tank or lagoon to form a floating layer. Leca® Aerotop is a product that tackles the issue of odour at their source and has been proven to significantly reduce harmful gas emissions. This innovative material floats on the surface of lagoons, storage tanks and run off areas to control the release of Hydrogen Sulphide (H₂S), Ammonia, Methane and other odours* (SeeTable: page 6).

The Scientific Innovation of Leca® Aerotop

The gas emission removal system is created by a catalyst reaction on the Leca® Aerotop surface, which contains iron oxide and other metal oxides. This means that the emission removal solution and performance will last – preventing the release of harmful gases and odour into the surrounding area.

The lightweight nature of Leca® Aerotop means that the aggregate simply floats on the surface of the lagoon or slurry tank, making it a cost effective, quick and simple solution in the prevention of harmful gases and odour. The iron oxides in the clay mineral structure acts as a catalyst for chemisorption of Hydrogen Sulphide (H₂S), Ammonia, Methane and other organic compounds.

The Leca® Aerotop floating cover solution can significantly reduce the capital costs involved in digestate storage solutions, while offering significant financial returns through the retention of nitrogen. Leca® Aerotop also reduces the financial costs required for the on-going maintenance required for alternative types of covers such as floating plastic covers and other fixed covers, which depending on the size of the lagoon can be extremely expensive, time intensive and difficult to install.

What is Leca® Aerotop?



Leca® Aerotop offers an environmentally friendly floating cover solution. It uses no plastics in its construction and can be spread on the land at the end of its usable life.

Leca® Aerotop innovatively rises and falls with digestate levels and allows for easy access to the digestate, this is essential for good digestate handling practice and regular agitation.

Floating Cover Solution



The right combination of measures for rain and storm water management will reduce the runoff during rain storms to detain and alleviate pressure on the sewage system.

Innovative and Quick Delivery Methods

We have accumulated a wealth of experience over the past 20 years in successfully transporting and delivering Leca® Aerotop to diverse agricultural projects throughout the UK and Ireland. Depending on the project, we can source the vehicles that best suit the project requirement. This also includes the popular and innovative pneumatic blowing delivery (see image facing) which can deliver Leca® Aerotop in difficult terrain and can be blown in at a distance of up to 40 metres allowing for greater flexibility and aiding environmental consideration to a variety of access and constructional challenges. This can be pneumatically delivered to provide immediate coverage to a lagoon. Another popular method of delivery is through tote bags (2.2m³ volume), which again make it easy to transport onto site.

How can Leca® Aerotop help?

Leca® Aerotop is the only lightweight aggregate with a granularity of 10-20 mm and has a bulk density that does not exceed 300 kg / m³. As suggested by the Department for Environment Food & Rural Affairs (DEFRA), in the Government document 'Code of Good Agricultural Practice (COGAP) for Reducing Ammonia Emissions', using lightweight expanded clay aggregate as a floating cover solution can provide an effective protective layer against dangerous emissions including Hydrogen Sulphide (H₂S), Ammonia and Methane into the surrounding environment.

Cost effective, Simple and Quick solution

Manufactured by Leca in its unique kilns, Leca® Aerotop is a Lightweight Expanded Clay Aggregate that offers many fundamental properties which make it a perfect solution for lagoon cover. Leca® Aerotop is a flexible and quick solution helping to reduce the build-up of crusting. A 10cm layer of Leca® Aerotop poured over slurry limits the emission of harmful gases and foul odours by up to 85%* (SeeTable: page 6)

The plot illustrates how measures to prevent storm water delay and reduce flood peaks by the principle of water detention



Leca® Aerotop is a good solution

Valuable Nutrient Protection Digestate is as valuable a commodity to British farming as spreading helps return to the land nitrogen, phosphate, potash and sodium. All four of these are important to the agricultural industry and for the future of British farming. Legal Obligations for Farmers and Anaerobic Digestion Plants Ammonia and odorous gases are produced by microbial activity in slurry, these gasses rise to the top of the surface and are released into the atmosphere at varying rates. The reduction in gas emissions (including ammonia and H₂S) and in the removal of foul odours of slurry tanks is becoming a major legal challenge for many farmers. There are a number of techniques available to farmers and digestion plant owners. However, many of these solutions have been found to be expensive and unfit for purpose. This is where Leca® Aerotop offers an innovative and proven solution (See Wrexham Bio-Gas Digestate Lagoon Case Study opposite)

The benefits of utilising Leca Aerotop on a slurry tank includes:

- Stable structure – does not degrade or collapse
- Durable and resistant natural clay mineral material without any hazardous or artificial components.
- Quick pneumatic installation available
- Lightweight nature means reduced construction costs, filling and removal costs.
- Well defined product grading (10-20mm).
- Leca® Aerotop has sorption capacity towards H₂S and several other compounds including ammonia and methane so the filter will start removing odour instantly.
- Up to 80% reduction in hydrogen sulphide emissions.* (See Fig. 1 Study Table).
- Reduced ammonia emission by up to 80%* (See Fig. 1 Study Table).
- Complies with EU Standards and BAT guidelines (Best Available Techniques)
- Reduces carbon dioxide and other vocs* (See Fig. 1 Study Table)
- No expensive roof or permanent cover required
- Proven ability to effectively retain nitrogen.
- A 10 cm layer can remove up to 80% of the contaminants
- Long lasting floating lifetime*
- Leca® Aerotop Environmental Life Cycle



Case Study: Wrexham Lodge Farm Biogas Ltd

Fre-energy in Wrexham is a major innovator in waste management in the UK and one of its major features is Lodge Farm Biogas Ltds Anaerobic Digester. Operating as an efficient slurry and food waste management system, their patented combined degritting and gas actuated mixing technology is designed to manage grit laden, high-strength wastes and slurries. The main aim of Lodge Farm Biogas AD is to assist local food manufacturers deal with process waste in an eco-friendly way. The lagoon was constructed to handle the digestate produced after the AD process. A valuable, natural fertiliser, digestate is by process virtually inert (most of gases converted to biogas by anaerobic digestion) and odourless. The application of Leca® Aerotop serves to meet regulatory compliance by handling the residual ammonia that would otherwise be released to atmosphere.

Environmental regulations set by DEFRA ensures that the levels of harmful gas released from waste management processes must be reduced to a minimum – Leca® Aerotop's unique properties prevents harmful gases into the surrounding countryside – potentially causing damage and pollution to the local area. These initiatives, and targets set by government to reduce gas emissions (including ammonia) and the removal of foul odours of slurry tanks is a major challenge for many farmers.

A quick and simple solution is to pour Leca® Aerotop directly on top of the slurry, which acts as an effective floating protective cover for a slurry tank or lagoon. A 10cm layer of Leca® Aerotop poured over slurry limits the emission of harmful gases and foul odours by up to 85%. The Leca® Aerotop floating cover solution is designed for reducing gas emissions (mostly ammonia) from liquid animal waste and complies with EU standards and BAT guidelines (Best Available Techniques) and may be used on a par with closed tanks. Conversely the Leca LWA provided a protective layer to keep the nutrients generated by the farm within the slurry.

Lodge Farm Biogas Site Manager, Tom said that....."The material did exactly what we required and this was to provide an effective cover for our lagoon with the aim of reducing the amount of ammonia released into the surrounding area. The material was quickly blown onto site with the Leca blowing machine with no issues and quickly covered the lagoon which is over 1200m² in size. This operation took only a few hours to complete. The floating nature of the material quickly provided a floating cover for the slurry pit.

"The time saving solution provided by Leca Aerotop was key performance indicator for us, we needed to find a product which would effectively reduce emissions of Ammonia and provide a protective layer for keeping the nutrients within the slurry in our farms."



Leca® Aerotop is a good solution



AEG Ltd are an organisation with close connections and experience within the agricultural sector who have seen first-hand, the increase in demand and urgency to find a solution to tackle harmful gas emissions. Darragh Magee (Managing Director at AEG Ltd) explains how AEG Ltd have become a synonymous organisation for uncovering solutions for farmland owners to tackle harmful gas emissions on a huge scale,

How Does LECA LWA Provide an Effective Solution?

It was discovered in 2015, that LECA LWA could provide an effective solution in eliminating the emission of the harmful gases, this was through historic research conducted by LECA Denmark and tested and applied in the Agricultural market directly. Darragh reflects on this time period, “Following comparative trial work comparing polymer treated LECA with ‘LECA AeroTop’ the product was introduced to the market in 2015.”

He goes onto explain how LECA Aerotop can scientifically achieve the results and why the solution has been effective, “The internal structure of LECA Aerotop enables it to float to form a cover. This cover reduces the effect of ‘wind whip’ across the surface of the slurry which would otherwise lift the escaping gases into the atmosphere. Its irregular shapes and sizes mean the aggregates form a jigsaw like barrier that prevents gases passing through it. This cover also reduces the effect of ‘wind whip’ across the surface of the slurry which would otherwise lift the escaping gases into the atmosphere.

Ease of Delivery Through Pneumatic Delivery

Furthermore, to the science behind LECA Aerotop, Darragh also believes the ability to pneumatically deliver the material, positions LECA Aerotop as an even greater solution, “It makes installation quick and easy. Providing suitable access can be achieved, LECA AeroTop can be blown onto any lagoon irrespective of its shape or size.” He goes onto confirm that, “We have blown LECA onto tanks up to 18m high. It is a great advantage that you can blow LECA AeroTop without having to carry out any preparatory work to the tank or lagoon.”



See Fig. 1 Study Table

	NO COVER	LECA® 10-20			
		2 cm	5 cm	10 cm	8 cm
Evaporation from water, kg/m ² x days Ration, no cover = 100*	5,8 100	5,9 103	6,4 112	4,3 75	
Evaporation from slurry, kg/m ² x days Ration, no cover = 100*	3,2 100	1,0 31	0,7 23	0,6 19	
Reduction of NH4-N, g/m ² x days Ration, no cover = 100*	13,2 100	4,0 30	3,1 24	2,6 19	
Reduction of total N, g/m ² x days Ration, no cover = 100*	11,6 100	3,3 28	2,4 21	2,9 25	
Reduction of ammonia NH3, ppm Ration, no cover = 100**	101 100				48 53
Reduction of methane CH4, ppm Ration, no cover = 100**	9542 100				493 6

The table shows the reduction of evaporated from clean water and slurry and the reduction of Nitrogen in different thicknesses of Leca® Aerotop.

*Danish Agricultural Technological Institute (today a part of Aarhus University), 1988.

**AgroTech, part of Danish Technological Institute, 2017

