



Lighting

Lubratec® Solutions for Animal-Friendly Farm Management



Lubratec

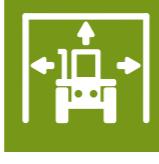
Livestock environments for greater animal welfare

The Lubratec brand offers you first-class solutions for animal-friendly livestock farming and breeding. Lubratec products will help you to promote the well-being of your animals by optimising environmental conditions in barns,

encouraging natural behaviour, reducing infections and much more. The high-grade, robust and durable systems will also improve the efficiency and flexibility of your farming operations.

Animal friendly farming is a challenge – Lubratec is the solution

The Lubratec product portfolio features a wealth of professional solutions for cutting-edge, animal-friendly housings for livestock farming and breeding. Lubratec will help you to reconcile animal welfare with efficient barn management.

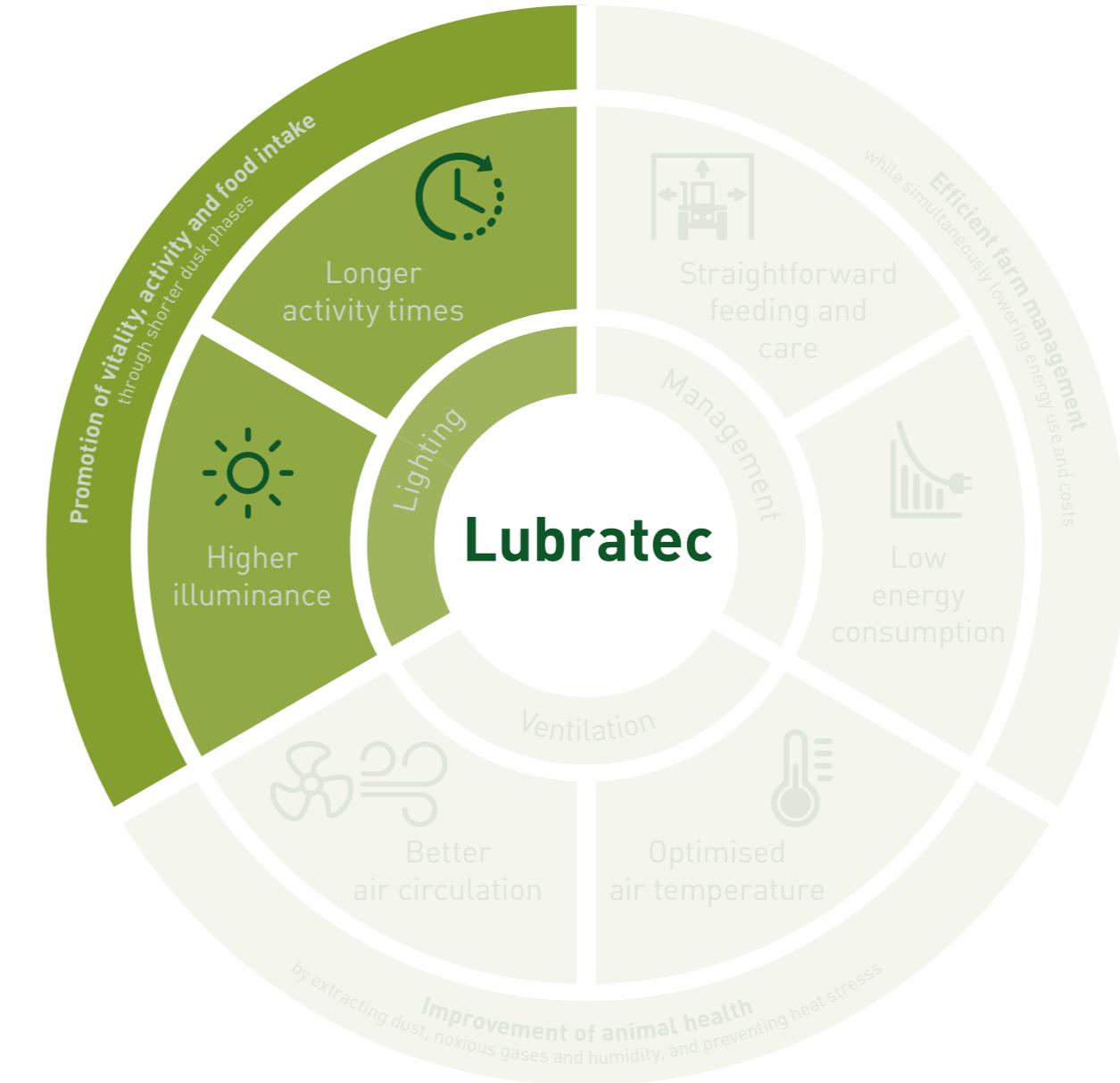
-  **Promotion of animal-friendly livestock farming**
-  **Encouragement of natural behaviour**
-  **Creation of healthy environmental conditions in barns**
-  **Improvement of animal health**

Lubratec Smart

With Lubratec Smart, you can implement modern barn climate control technology through the intelligent networking of Lubratec ventilation and lighting products.

Your advantage: You can control and regulate all products centrally. In the Lubratec Smart App, you always have an overall view of your products and the respective settings.

Look out for the Smart Ready logo in the brochure. This allows you to see at a glance which products can be integrated into the Lubratec Smart System. Thanks to the coordinated complete solution of hardware and software, you can be sure of an ideal stable climate at all times.



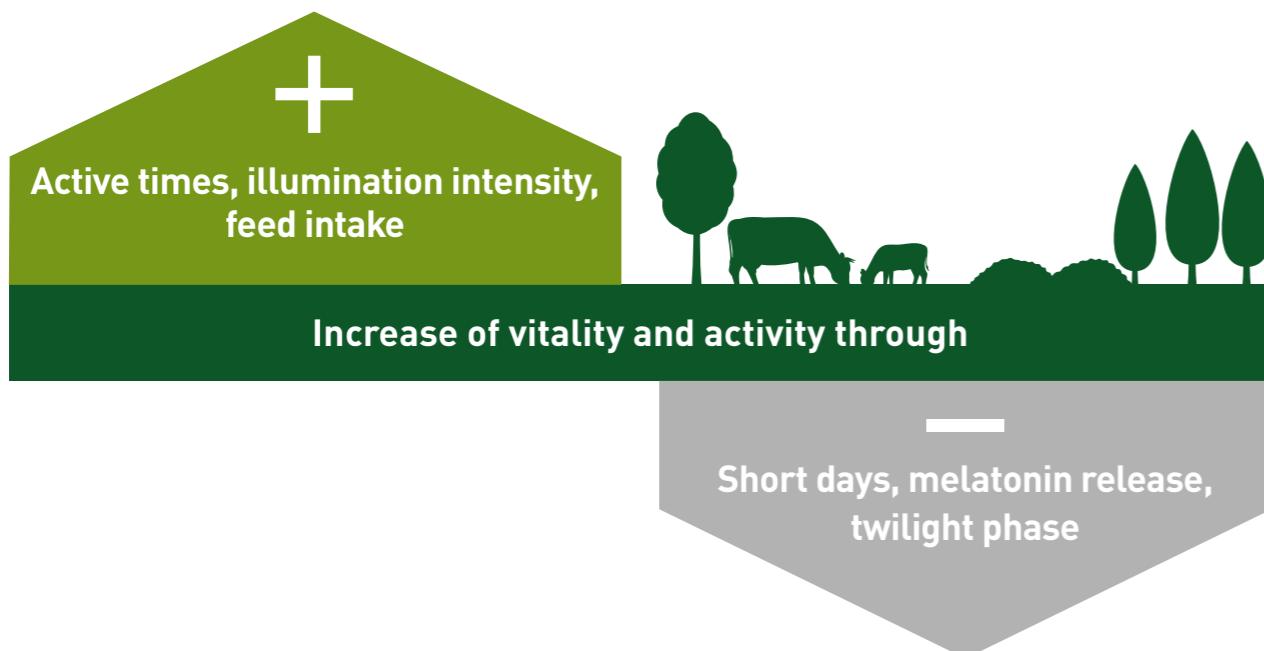
Lighting systems

To increase vitality and activity

In modern farm management, light is a success factor that is often underestimated. Light is vital for humans and animals and has effects on health and performance. Insufficient exposure has a negative impact on animal welfare.

Natural daylight and active lighting ensure longer active times and enhanced vitality, combined with increased feed intake. The optimal interaction of Lubratec products improves the lighting in stables and buildings.

Natural and active lighting reduces melatonin release, twilight phases and short days, for example in cattle farming. At the same time the formation of prolactin is increased. Thanks to the selection of high-quality materials, our products have all the prerequisites that modern lighting systems have to meet: long durability with maximum light yield and high economic efficiency through energy saving.



Product overview

Natural lighting

6–7



Lubratec Light Ridge

Active lighting

8–9



Lubratec LED barn light

Effects of lighting

10–13



Increase of vitality and activity

Natural lighting

Lubratec Light Ridge



Supervised specialist assembly on site



Product benefits

- Continuous air extraction through suction effect
- No greenhouse effect
- Optimal use of daylight – more light in the building
- Special fabric foil scatters the light and keeps the building cool
- Uniform illumination
- Extremely robust special fabric
- Stable round arches take high static loads on
- Opening width of 5 meters

We help with professional installation – use our installation service!

- Installation accompanied by a HUESKER chief fitter
- Pre-assembly of the elements on the floor
- Unwinding and tensioning the tarpaulin
- Installation of the wind deflectors and the gable cladding

Technical details

The robust arch assembly made of hot-dip galvanised steel and sturdy woven membrane provide the maximum degree of structural safety.

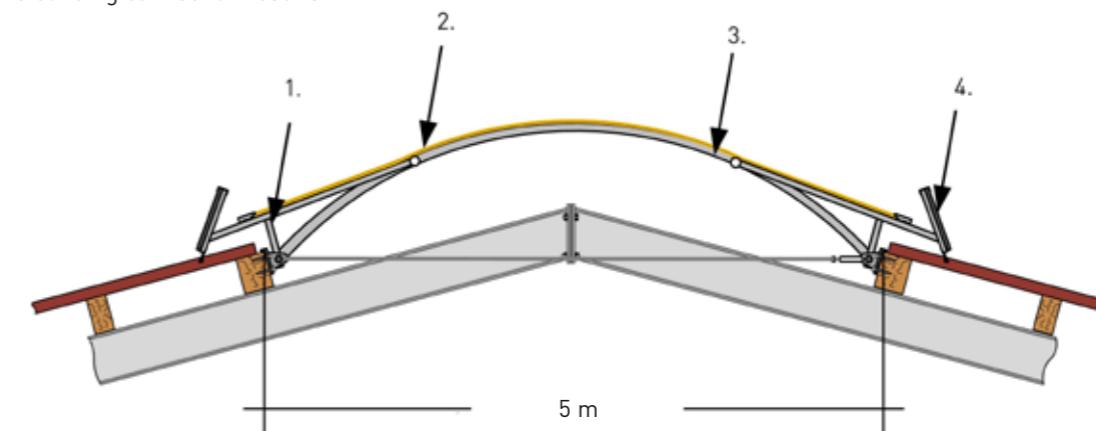
1 Robust hot-dip galvanised steel brackets

3 Round arch construction

2 UV-stable, polyester-woven-reinforced membrane

4 Wind deflectors made of plastic-coated steel sections

We recommend an object-related structural analysis from which the optimum bracket spacing as well as the load for the building connection results.



UNIQUE SPECIAL FABRIC

TARPAULIN PES-PVC 55 SKY:

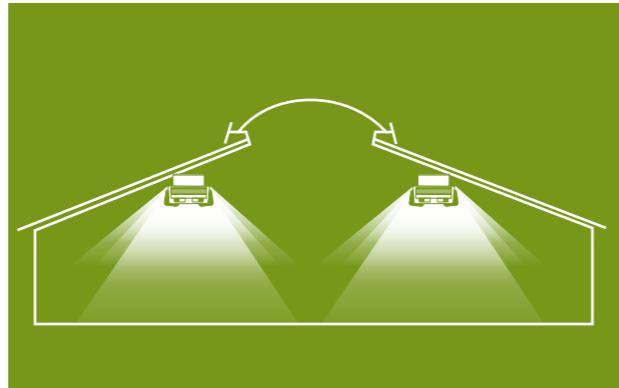
High strength polyester fabric with double-sided PVC coating for maximum light penetration

Active lighting

Lubratec LED



Technical specifications Lubratec LED luminaires



Product benefits

- Optimized light spectrum for animals
- Highest light output per watt
- Up to 60% energy savings
- Long service life due to high-quality materials
- Promotion of vitamin D production
- Water and moisture resistant
- Can be integrated into the Lubratec Smart System

Overview Lubratec LED

	LED LIGHT BAR	LED DOUBLE	LED TRIPLE
Colour temperature (full spectrum)	6,000 K	5,600 K	
Luminous efficacy in lumen per watt	>130 lm/W	>135 lm/W	
Type LED chip	LED Chips	EMC3030 Chips	
Wattage (max.)	60 W	150 W	225 W
Material support frame	Steel, powder coated		
Material housing with heatsink	High quality aluminium		
Expected service life	> 15 years		
IP rating	IP65		
Acid resistance	+ (good)		
Dimensions (LxBxH)	1200 x 65 x 45 mm	333,6 x 271 x 274 mm	414 x 336 x 289 mm
Weight	~ 2,7 kg	~ 9,3 kg	~ 11,3 kg

Lubratec LED Light Bar



Lubratec LED Double



Lubratec LED Triple



The high-power LED chips generate light at 5,600 K, producing 135 lumens per watt. The cast aluminium housing with cooling fins is powder-coated.

A robust flat glass, which is securely screwed multi-sided, seals the interior with the IP65 protection class. The brackets of the suspension are made of stainless steel

and ensure a safe and durable fastening. The switching technology allows manual switch-on even in dimmed state as well as automatic switch-on depending on the time of day and daylight. The switching technology can also put certain LED lights into night light mode. The light wave spectrum is specifically tuned to the receptors of the animals.

Increased animal welfare and energy savings

The question of the right lighting for barns and halls are often neglected. However, it is also decisive for the well-being, performance and health of the animals and people who spend time there every day. This applies to both new buildings and when the old exposure system is replaced.

The lighting of barns and halls requires careful planning to satisfy both humans and animals. Topics such as good illumination, high energy efficiency and simple installation and maintenance are the main economic aspects. The increase of animal welfare is another factor to which the LED lighting pays in.

Due to the different anatomy of the animals compared to humans, there are also special requirements for exposure systems that should be considered.

Animals see differently than we humans. By the arrangement of the eyes at the side of the head and the different structure of their eyes they take light differently. Therefore, exposure systems in the animal area should have a light spectrum that is particularly animal-friendly. At the same time, it is important that the lighting is as even as possible. But not only your animals benefit from environmentally friendly LED lighting. The right lighting of the building is also more pleasant for people and, in case of doubt, even prevents accidents at work. Good, bright light contributes to the well-being of animals and humans and is the basis for increased productivity.

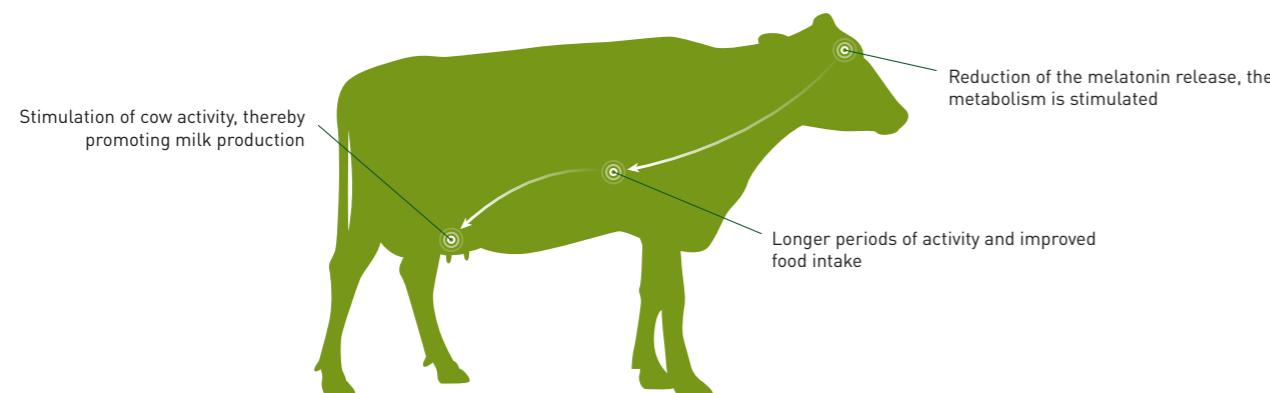
Light programme for cattle

Lighting in the cattle shed

Light is a vital factor in the cattle shed. It has a positive effect on your animals. Sufficient and correct lighting in the barn promotes education of vitamin A/Betacarotin and vitamin D3. To the hormone balance of dairy cows, light also has a positive influence. The melatonin release (sleep hormone) is inhibited, which leads to longer active times. Barns that are too dark are perceived as twilight

by cows, which promotes the release of melatonin and thus inhibits the production of prolactin. This results in a reduced activity time and food intake, and the animals' metabolism decreases. Lower metabolic activities have negative consequences on the oestrus behaviour and fertility of the animals. The reduced feed intake also reduces the milk yield of the cows.

Benefits of correct lighting



Promotion of vitamin A and vitamin D3 production



Inhibition of melatonin release – longer active periods



Increase of vitality and feed intake



Improvement of the metabolism – promotion of oestrus and fertility

Influence on milk yield

In autumn and winter the days are short. Artificially prolonged daylight hours through proper lighting can increase milk yield between 5 and 16 %, as has been proven in several studies. Melatonin, which only forms in the dark, is the antagonist to the body's own growth factor IGF-1, which increases performance and stimulates milk production. The additional lighting means that less of the hormone melatonin is produced and the growth factor IGF-1 is increased. With an optimal lighting duration of 16 hours with a light intensity of approx. 140 lux, the

performance-enhancing effect sets in after 4 weeks. The animals need a total of 8 hours of darkness, otherwise the opposite effect is achieved. The increase in milk yield results in a feed intake increased by approx. 8%, which has a positive effect on the animals' energy balance. According to these studies, the lying periods, which have a positive effect on milk production, are extended. The additional light has no effect on the protein and lactose content of the milk.

Lighting comparison*

LIGHTING COMPARISON*	LIFETIME in hours	LUMINOUS EFFICACY in lumens per watt	ELECTRICITY COSTS per animal place (€) at illuminance of 80 lux
Fluorescent lights (standard) Spot illumination with shorter lifetime	6,000 – 8,000	60	4.28
Sodium vapour lights High heat generation	30,000	120 – 140	3.09
LED luminaires Uniform illumination with optimized light spectrum	50,000	135	2.48

* State Office for the Environment, Agriculture and Geology Free State of Saxony „Modern lighting of stables for working and animal comfort“.



Benefits of LED lighting systems

- Good light yield
- Good colour reproduction RA > 80
- Immediate luminosity, on request also soft up and down
- Dimmability
- Color temperature as daylight (5,600 - 6,000 K)
- Wavelength of the spectrum matching the receptors of the animals
- Low maintenance requirements
- Long service life
- Reduced power consumption

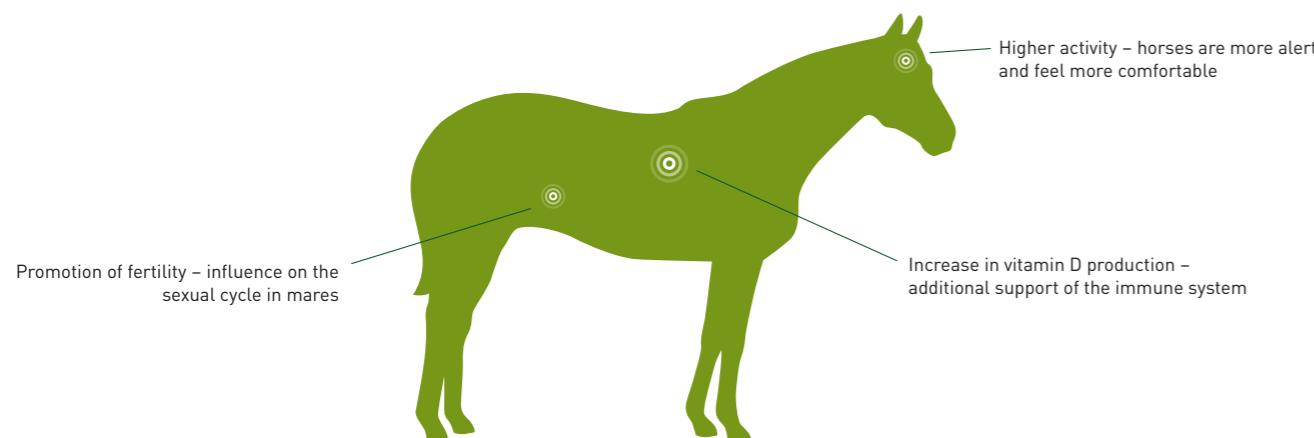
Light programme for horses

Lighting in the stables and riding hall

Light has a direct influence on your animals in the stables and riding hall. Sufficient and correct lighting has an effect on the well-being and motivation in both buildings. With the right and sufficient exposure, melatonin secretion is inhibited. This makes your horses more alert and active. The change of coat is also partly triggered by melatonin. Prolonged periods of darkness increase the melatonin level in the body. Especially in winter this is a sign of the organism for the natural change of coat.

Sufficient lighting is important for the production of vitamin D, which helps build bones and teeth. In addition, vitamin D strengthens the immune system and helps to process stress. If there is a lack of light, horses become a bit more cumbersome when riding. With mares, light also has an influence on fertility. Due to too little light supply, mares become less likely or not at all to get in heat. With good lighting management prevent this and ideally it can even influence the mare's sexual cycle.

Benefits of correct lighting



Inhibition of the melatonin distribution



Support of the immune system



Improved fertility of the mare



Measurable stress reduction

Additional positive effects

Every horse has the need for social contact with other horses. If this is not possible, at least visual contact is recommended. In dark stables there is a danger that the visual contact to other horses is restricted. This can lead to behavioural disorders such as weaving and cropping. In indoor riding arenas, good lighting can prevent

shadows and light spots from forming. Especially young horses react very jumpy to this. Casting shadows in indoor riding arenas increases the risk, that horses get frightened because they cannot adapt so quickly to changing light conditions.



Good stable and riding hall lighting with the right illumination and the right lighting programme has the following positive effects:

- More active and healthier horses
- Possibility for better visual contact
- Better fertility
- Thinner winter coat
- Uniform and reflection-free illumination



Optimal training and tournament conditions through the use of Lubratec LED luminaires.

Product benefits

- Up to 60 % energy savings through targeted, adjustable light scattering
- Health-promoting lighting
- Long service life, as water and moisture resistant
- Dust-insensitive

HUESKER

The know how behind the Lubratec systems

Building on its 150 year plus corporate history, HUESKER boasts a long and successful track record of innovation in the agricultural sector. We offer wide-ranging solutions in the fields of animal welfare, biogas, liquid manure and

silage protection. Described below are our key service offerings that are designed to simplify your work. Please feel free to talk to us about your needs and let our experts assist you with your requirements.

We will assist you in developing a feel-good package for your animals and yourself.

Production

We will fabricate and assemble your Lubratec solution at our production sites in Germany to give you the full benefit of our 150 year-plus experience in textile manufacturing. Our products are specially designed for reliability and durability so that our customers can focus their full attention on their livestock.

Customisation

Custom-fabrication of your products is the centrepiece of our service portfolio. Your job is to specify the size, colour and technical performance. Our job is to deliver the solution. This way, you receive a product which meets your requirements and expectations.

Digitisation

Smart Farming for maximum animal welfare. With Lubratec Smart, your Lubratec ventilation and lighting products are intelligently networked and controlled. Thanks to the coordinated complete solution of hardware and software, you can be sure of an ideal barn climate at all times.

Installation

To guarantee that everything functions properly to provide you and your animals with the full benefits of Lubratec from day one, all products are installed by experienced operatives. Our on-site service can also be used to arrange for expert instruction in the operation of our various systems.

Consulting and design

With a wealth of experience gathered on numerous projects, our experts will be delighted to advise you on the design of your new-build or refurbishment scheme. If you so wish, we will liaise directly with your architect to ensure the entire design process runs smoothly.



Maintenance service

On request, HUESKER will also perform the annual maintenance on your Lubratec products to ensure that they enjoy a particularly long and trouble-free service life. The time you save on upkeep will then be free for you to spend with your animals.

Lubratec® is a registered trademark of HUESKER Synthetic GmbH.
HUESKER Synthetic is certified to ISO 9001, 14001 and ISO 50001.



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Ideen. Ingenieure. Innovationen.