

LASCO
www.lasco.at



The key to Drying success!

We plan and realize drying facilities throughout Central Europe for 30 years. During this time we could not only build up an extraordinary wealth of experience, but also acquire a great deal of knowledge. Due to this, today we are not only recognized as a pioneer but also as a technology leader when it comes to hay drying.

An old saying goes: *"Many roads lead to Rome"*. Therefore, an intensive consultation is very important for us. Together with the customer, we coordinate the necessary and possible ways of drying and provide information about which drying technology is required. Because every drying plant is different. We offer the choice between dehumidifiers or LandriTherm air heaters. Often a combination of both systems is the right choice.

You might not know, but when you buy a LASCO fan a box and a hood suction plan is already included? Because the key to successful drying lies in good advice, great planning and intensive training.

If you have any questions, please feel free to reach out to me and my team.

Johannes Landrichinger

LASCO
www.lasco.at

LASCO Heutechnik GmbH

Lascostraße 1
A-4891 Pöndorf (near Salzburg)

Telephone: +43 (0)7684 / 21 666
Fax: +43 (0)7684 / 21666-4

Email: office@lasco.at
Web: www.lasco.at

How you can find us:



Content

The hay industry is back. With technology of today!	4
Advantages of machine hay drying.	5
Hay drying in the box.	6
Round bale drying.	8
Floor duct drying.	9
Kombi Flex System	10
Flex System.	12
Biogas heat utilization	14
Container drying	15
Gill plate drying	15
Fan technology	16
Hood suction	17
LandriTherm Warm air blower	18
Powerline dehumidifier	20
Drying control device	24
Accessories	26
Company LASCO	27



The objective of every forage harvest:
Keep preservation losses as low as possible.

The hay industry is back. With technology of today!

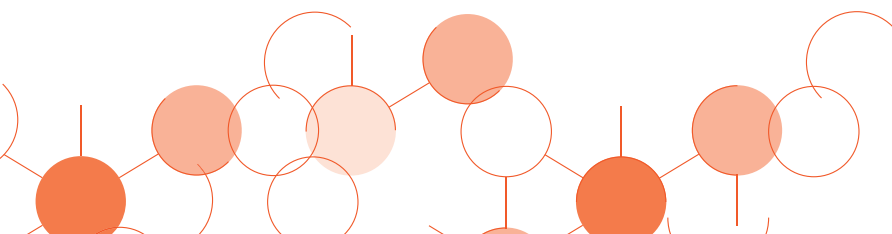


Best hay quality thanks to modern technology.

With more than 8,000 hay milk farmers, Austria is one of the spearheads on the European hay milk market and this despite the fact that the silo industry triumphant progress started in the 1970s. Unprecedented area performances could suddenly be harvested and preserved faster than ever before. As a result, the hay industry has fallen into complete oblivion in many regions of Europe. Not so in Austria. The reasons for this are of geographical as well as political nature.

While the silage chain sit up and take notice of good feed values, the farmers were looking for additional ways to improve the hay quality. That was the hour of birth of the classic hay ventilation. The vents by that time were compared to today, very expensive and therefore inefficient in operation.

Thanks to the use of modern drying technology, the quality of forage and the potential impact force have been brought into line with the level of the silage chain.



Advantages of machine hay drying

Feeding stuff analyzes are giving a clear picture. Machine-dried hay need not shun the comparison with grass silage. This is hardly surprising. The cutting time is almost identical and the lower field lay time reduces the leaf losses. And even the silage chain is not completely loss-free. For what are the leaf losses in the hay industry, are the fermentation losses in the silage industry. The fermentation losses in silage conservation are roughly offset by the crumbling losses in hay advertising.

The perfect cutting time

The cutting time decides how many and which nutrients and energy the harvested plant carries. During the ear of corn panicle-pushing we get an optimal ratio between yield and energy density. One speaks of the ear of corn panicle-pushing when about 50% of the leading grasses of the stand push the tips of the ears laterally out of the leaf sheath.

At the perfect time of cutting, basic feed performances of up to 6,500 kg milk per cow per year can be achieved.

Advantages

- Short field laytime
- Perfect cutting time can be used
- Low crumb losses
- In terms of ingredients comparable to grass silage

What else is dried hay good for?

- dried hay has a pleasant aromatic fragrance (tourism + quality of life)
- Marketing opportunity: Hay milk is more of a niche product on the European market
- It is particularly suitable for the production of great cheese specialties without additives
- Hay has a less specific weight compared with silage



Tip: With a residual moisture content of less than 35%, the leaf losses due to machining are significantly increasing. The hay harvest should take place at a residual moisture of 35%.

How to recognize good hay?

In addition to a professional feed analysis, a sensory evaluation of the hay can be carried out. This is a rating with the available sense organs (see, smell, feel).

Color: The more intense the natural green of hay, the higher the amount of α -carotene in the feed can be considered. As a preliminary stage of vitamin A, β -carotene is needed for important functions of the body.

Structure/Appearance: The better the individual plants are preserved, the higher the leaf proportion will be. A sign of minor machining. Are the grasses predominating? Are the stems lignified? Here you can draw conclusions about the cutting time.

Odor: Smell it vigorously. If the smell leaves an irritating sting in the aftertaste, moulds may be present in the hay.



LASCO Hay drying in the box

You can dry large quantities easily.



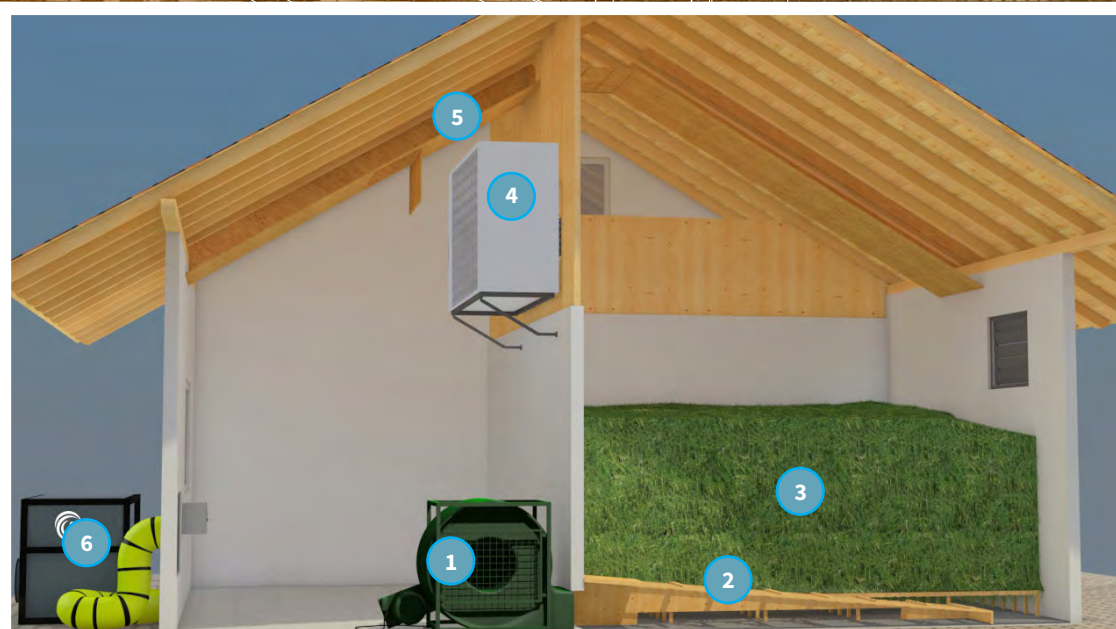
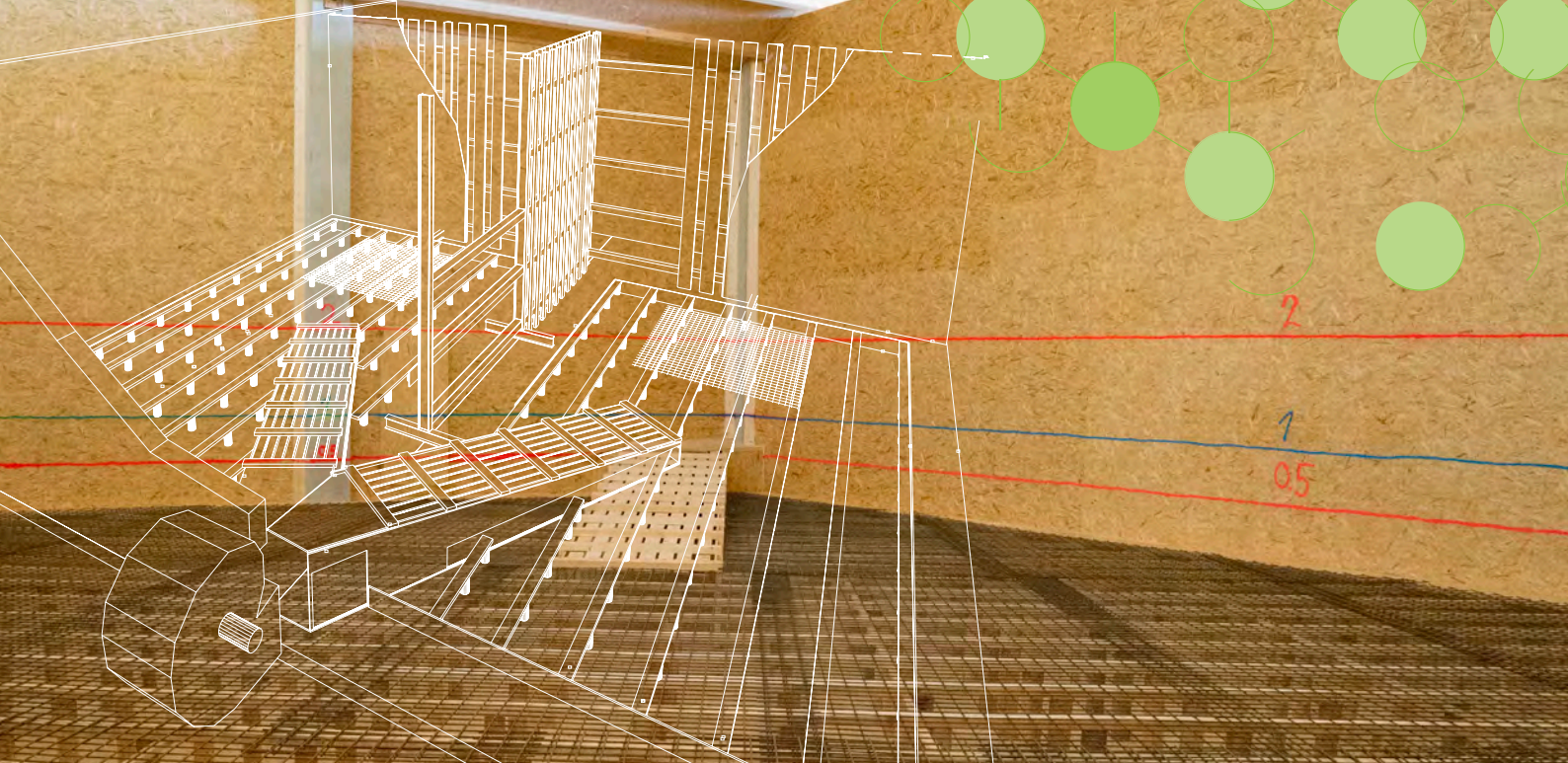
Every hay drying is different and therefore will be individually planned by us. The calculation of the required floor space is an important step. For best drying results, comprehensive consultation and planning is carried out on site. The core element of our drying technology is the hay box. We calculate the grate height and the blow-in duct appropriately. This ensures a very uniform air distribution in the hay box and thus leads to a uniform drying.

The equipment of a hay drying can vary a lot and at least consists of a fan that blows drying air into the hay box. In this arrangement, it is essential that the air and pressure of the fan are aligned with the hay box. Systems consisting of only one fan and the actual hay box are called hay ventilation. In order to be able to dry at night or through bad weather periods, you need a drying device, such as a dehumidifier or LandriTherm air heater.

System benefits

- Drying of large and small hay batches
- comparatively low drying costs
- easy handling
- by controlling a high degree of automation
- several boxes can be controlled by different air damper positions.
- more efficiency through hood suction
- convenient loading with a hay crane





- 1 Depending on the size and height of the hay box, an appropriate high-performance fan will be selected. Air and pressure performance are perfectly matched to one another.
- 2 The blow-in duct guarantees a very uniform air distribution. This reduces the risk of so-called moisture nests.
- 3 The drying air flows through the hay and saturates itself with water.
- 4 In bad weather, a high-performance dehumidifier provides air treatment. The highly saturated drying air will be dehumidified, warmed and used again for drying. In good weather conditions, the hood suction
- 5 system will take over the air treatment. For this purpose, the sun-heated roof surface is aspirated. As an alternative to a dehumidifier, the air treatment in bad weather can also be managed by a LandriTherm air heater.
- 6



LASCO Round bale drying

Probably the biggest advantage of round bales lies in the flexible handling during transport and trade. Several storage and feeding locations can be used and feeding locations can be used and they allow an economic portioning. The costs of sheets and their disposal are completely eliminated.

Our round bale dryers are as individual as your company and leave nothing to be desired in terms of drying speed, impact force and plant size. Systems that have proven themselves hundreds of times ensure reliable drying results and pleasure when working with hay.

Many mixed operations state that more hay will be made after completion of the drying plant, as the quality of forage is second to none.

Due to the optimal air distribution, our systems allow very short drying times and best forage quality due to optimal aeration. We offer our customers the option of three almost turnkey drying systems.



System benefits

- Drying of large and small hay batches
- comparatively low drying costs
- easy handling
- by controlling a high degree of automation

Drying equipment

Round bale drying can be equipped or extended with high-performance dehumidifiers as well as LandriTherm air heaters.

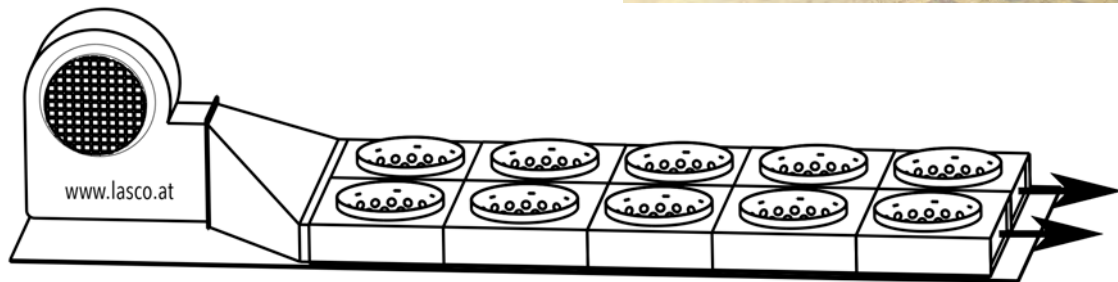
LASCO Floor duct drying

The biggest advantage of floor duct drying is the trafficability when laid under concrete. The setting up of a round bale drying can be done in-house. Thus, with a sufficiently stable substructure on the drying facility, it can be driven on with a tractor or a courtyard loader.

In order to avoid large heat losses, the duct should be made of insulated design.

The LASCO modular design is characterized by the fast start-up, the low acquisition costs and a particularly good air flow.

The sheet metal duct design is an example for simple function and design. Thus, up to two bales per hole can be dried and the system is firmly screwed to the subfloor.



LASCO floor duct drying is available in various sizes. It is equipped with air brakes as standard and can be supplied in single or double rows.

9



Single-row sheet metal duct drying with roof suction.



The floor duct drying system is trafficable if it is made of concrete. In this way, the space can be used meaningfully for machines in winter.

Round bale drying Kombi-Flex-System



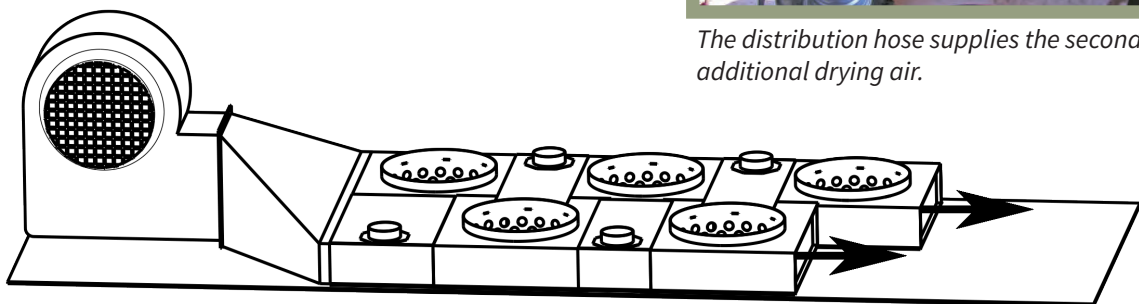
The Kombi-Flex-System is the professional solution for all hay farms that rely on a powerful and fast drying! The Kombi-Flex-System supplies the second round bale with fresh drying air using flexible hoses.

Using the Kombi-Flex-System, the drying efficiency can be increased by up to 30% compared to the floor duct system.

The Kombi-Flex-System is steplessly variable and can be executed as single-row or double-row.



The distribution hose supplies the second row with additional drying air.



The Kombi-Flex system can be provided as a single-row or double-row system and is adapted to the drying capacity of the respective agricultural operation.

We will show you how it works!

Pressing the round bales

The pressing of round bales is decisive for the drying success of a round bale drying. A less important role is played by the pressing system. As you know, variable pressing systems are just as suitable as fixed chamber balers. We communicate our knowledge in customer trainings as well as in personal discussions.

We'll show you how you can speed up your drying process, turning it to perfection.

With several hundred installations of round bale drying systems, we have the necessary expertise and make this available for your individual drying success.



designed with much attention to detail: Our floor duct drying system and the Kombi-Flex-System have air brakes as a standard. These provide uniform air velocities through long air ducts. It is essential, if all round bales are to be dry at the same time.



Kombi-Flex facilities can be put together individually to suit every operation. Single-row and double-row systems are available.

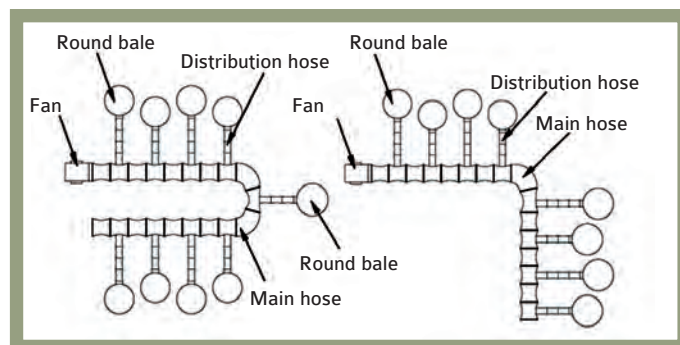


Round bale drying Flex system

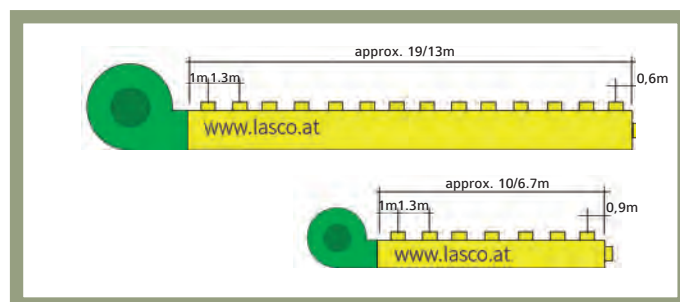
The LASCO Flex system basically consists of a LASCO high-performance fan, a main hose and many distribution hoses. The distribution hoses are attached to a distribution ring, which is then inserted between the bales. This ensures uniform ventilation of the bales and reduces handling to a minimum.

The system can be set up within a very short time, as well as quickly and completely dismantled again in winter (after completion of drying). In winter, the covered drying area can be used for other purposes and does not obstruct large areas.

All in all, the Flexi system is flexible and can find its place in any yard. The facility can be installed either on the ground or hanging and can be assembled in all possible building forms!



The Flex system adapts to local conditions.



Dimensions of Flex 30 (top) and Flex 16 (bottom) for long and short versions respectively.



By using flexible hoses, the flex system can also be mounted on the ceiling, which makes it particularly space-saving.



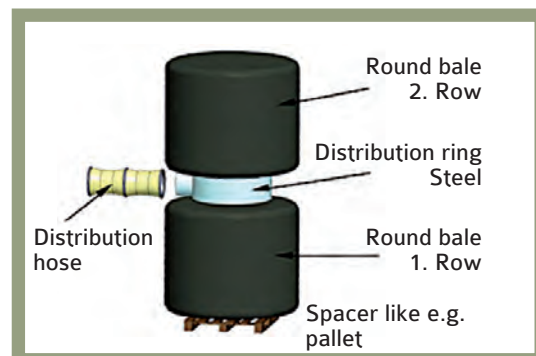
FLEX system - available models

The Flex systems for 16-bales and 30-bales can each be ordered as a short or a long version. The 8-bale flex systems are only available in one size since there is no main hose. Special designs available according to customer requirements.

Furnishings	8 Bales	16 Bales	30 Bales
Main hose	-	approx. Ø 700mm	approx. Ø 1100mm
Distribution hoses Hot Temp polyamide	4	8	15
of which length approx. 1.7m, Ø approx. 300mm	-	4	8
of which length approx. 3m, Ø approx. 300mm	4	4	7
Fan	acc. to order	acc. to order	acc. to order
Length version "short"	-	6,7 m	13,0 m
Length version "long"	-	10,0 m	19,0 m
Distribution head	yes	-	-
Transition from fan to main hose	-	yes	yes
Distribution rings (stackable)	4	8	15
Closure cap	-	3	5
Strapping belts with quick release		8	9
Strapping belts with ratchet fastener	8	9	16



For small businesses there is the Flex-8. With this variant the main hose is omitted.



Detail structure.

Biogas heat utilization



A useful waste heat utilization of a biogas plant is the drying of agricultural products. The free waste heat can be used for drying hay, grain, corn or other granular materials.

Often, such systems are then also used inter-company and constructed for multi-functional drying. Several products can be dried in such a plant, such as wood chippings, fire wood or round bales.



The heat exchangers are available in different sizes and are delivered to match the drying facility.

Construction of a heat exchanger network in a drying facility.



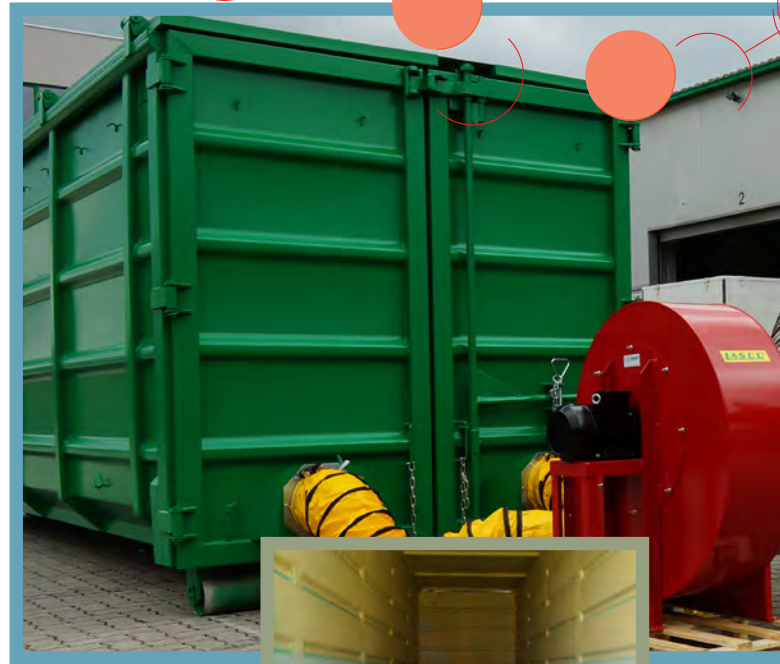
High temperatures in the drying room have a negative impact on the service life of the drive motors. Pipe systems can be used to install a simple cooling system.

LASCO Container drying

LASCO container drying is based on a roll-off container with integrated drying floor.

The drying floor consists of our proven gill plate, which is regularly 3 mm thick and hot-dip galvanized. Two blow-in openings ensure an even distribution of dry air.

The heat exchangers can be perfectly combined with the drying container. The container can accommodate about 33 m³. Drying is possible in containers, e.g. wood chippings and fire wood.



Consistent drying due to double blow-in paths.

LASCO Gill-plate drying



Depending on the substructure, the gill plate drying is trafficable

If wood chips are to be dried in a box, our gill plate is the right choice for a tool to achieve this. With our gill plate, almost any material can be dried.

Due to the characteristic gill shape, falling through of material to be dried into the pressure chamber is largely prevented.

A drivable version has proven itself to be ideal. A corresponding dimensioning of the substructure will be carried out by us on request.

You want to dry wood chippings?

Forest-fresh wood chips has a water content of 40 - 60% on (and has large differences in the moisture content between core and sapwood). The calorific value of fresh wood chippings is around 2 kWh/kg. The calorific value of dry wood chippings (water content <20%) is 4kWh/kg. Double calorific value for the same fuel amount.

Advantages

- more calorific value for the same fuel amount or less fuel consumption for the same calorific value
- better and cleaner combustion - less ash content
- The weight during transport (transport costs) is also reduced



Drying equipment

Fan technology

With over 80 different fan types, we not only have a very extensive fan range but also a particularly efficient one.

Due to the wide range of sizes and the specially developed turbine wheel, the right fan is selected for each drying facility.

The special side walls structure of the fans significantly reduce the resulting noise level.

- over 80 different fan types
- specially developed turbine wheel
- high power savings possible
- suitable for each floor size and height
- Each box drying or round bale drying is calculated individually.
- extremely pressure stable & extremely high air volumes



LASCO fans are wellknown for their smooth running. They are running silently.



Depending on the drying requirements, directly flanged or V-belt driven fans are selected.

In addition to high-performance fans, we also offer high-quality standard hay ventilation fans.



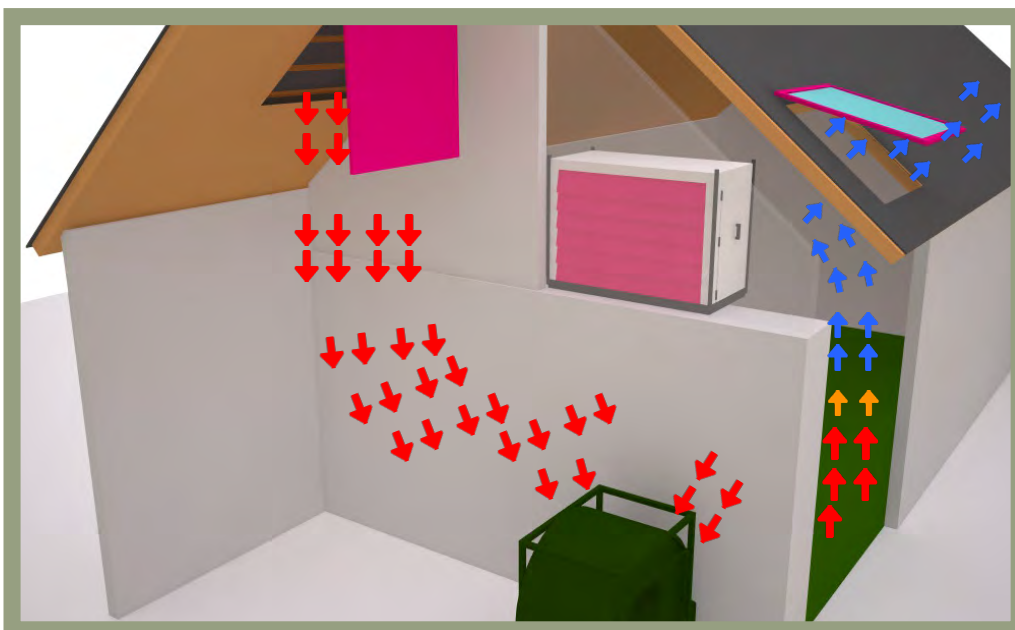
Hood suction

If you are planning a round bale plant or a hay box, you should also think about building a hood suction. In the case of a new building, the construction of the hood suction system should be regarded as compulsory. Depending on the hood system, you can gain several 100 watts per m² of roof area. Once the hood suction has been installed, it is possible to efficiently produce warm air for drying purposes for decades.

We will be happy to prepare a concept plan for you and carry out the necessary calculations.



In warm weather, the roof heats up. Such warm air will be sucked off. At night or in bad weather it can be switched to be used as a dehumidifier on a circulatory system.



Schematic of a drying facility in hood suction operation.



LandriTherm Warm air blower

Since 2006, LASCO Heutechnik GmbH has been developing and producing heating cannons that work in a similar way to an oil heating cannon. Those devices are sold under the brand name LandriTherm. The big difference between the LandriTherm heating cannons and those fuelled by fossils is the strict use of biomass for the heating process.

Those heating systems are transportable and produce warm air from biomass. Technically, a high-performance flue gas/air heat exchanger is used for this purpose. This means that the devices produce warm air without detour via water (as usual) and are therefore highly efficient. Warm air generated is utilized as process or room heat. These devices are very popular especially in the agricultural sector.

In 2013, the portfolio was expanded to include our pellet series. This product series is preferably used in industry and trade sectors because of its simple fuel storage in pellet silos and the existence of nationwide pellet suppliers.

Constructed as containers, the devices can be installed indoors without any problems. There is no need for expensive remodeling and installation work.

LandriTherm is a brand belonging to LASCO Heutechnik GmbH.



You can find the complete device series as well as further application options in LandriTherm's heating technology brochure. The brochure can be ordered free of charge under:
www.landritherm.com

Warm air drying

For decades, grain and corn have been successfully dried with warm air. Because warm air dries much better than cold air. While heating the air, the relative humidity is reduced. Thus, the air is able to absorb more water. We also utilize this principle for the drying of agricultural products. Depending on the weather and demand, the hot air heating will be started automatically via an optional drying control device, which then takes care of the air treatment.

For hay drying particularly the equipment from the wood chippings furnace series and the firewood furnace series are suitable. Both fuels are often produced by the farmer himself.

Advantages of LandriTherm:

LandriTherm offers a wide range of a performance spectrum

- Depending on the device class, wood chippings, firewood or pellets can be burned
- Due to the container design, the devices are not bound locally
- The devices can be set up outdoors
- The simple installation saves costs.

Device types / rated power



Scheme of a drying plant with LandriTherm warm air heater.

Powerline Dehumidifiers

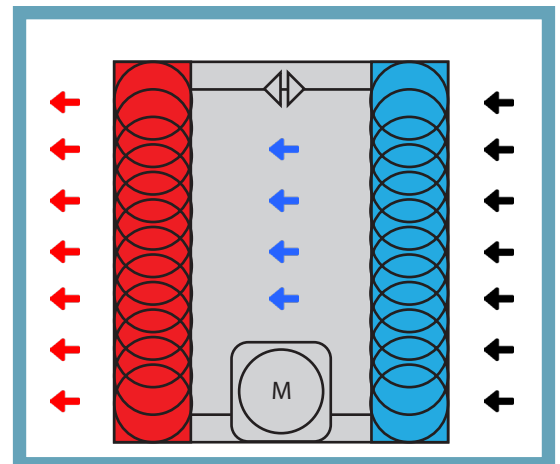
- ✓ mehr Schlagkraft bei gleicher Baugröße
- ✓ bis zu 40% mehr Leistung
- ✓ perfekt abgestimmte Verdichter
- ✓ made in Austria



The dehumidifier is the heat pump for the haystack. In the evaporator (that heat exchanger which is aligned towards the haystack) air is cooled below the dew point. The humidity of the air flowing through condenses on the fins. This removes the water from the air.

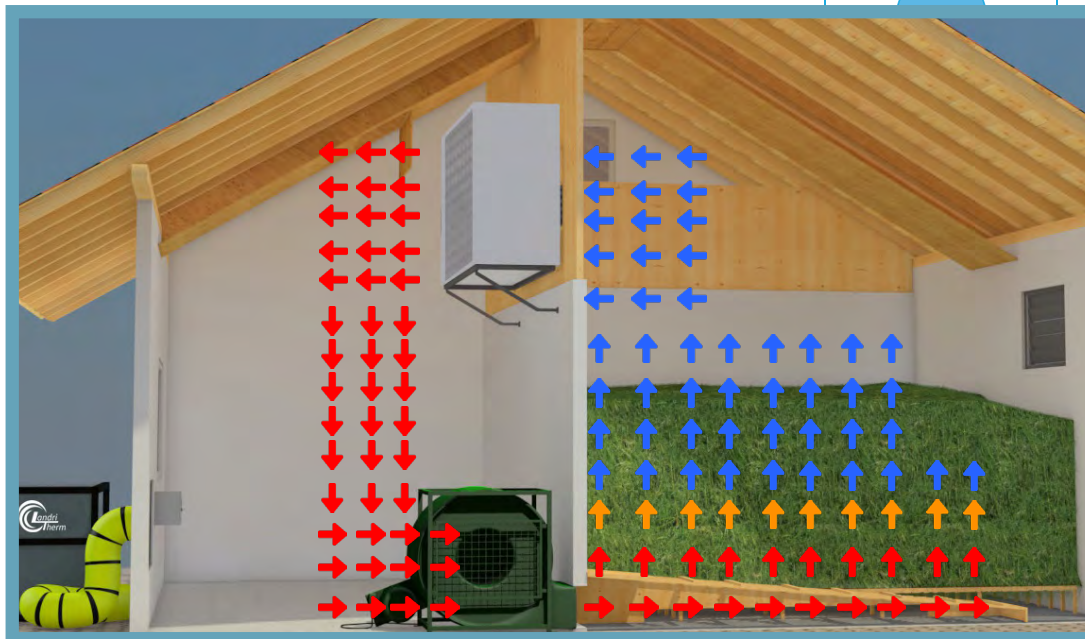
In the condenser, the refrigerant is compressed by the compressor and thereby heated. The effect is: Air flowing through is warmed up. Cooling facilities in supermarkets work according to the same principle. The only difference: The produced heat is often brought to the outside via emergency coolers and considered as a waste product.

In drying technology, the heat generated during the refrigeration process is a valuable gift as the drier air is warmed up again and thus even more water can be removed from the haystack. Many technical refinements, such as the choice of the compressor and the heat exchanger design make us a competent system supplier.



Scheme: Circulation of the refrigerant. The compressor (blue) is cold and the condenser (red) is warm.





Selection table: LASCO Powerline Dehumidifier

The LASCO Powerline series stands for more nutrients in the hay, less supplementary feeding of concentrated feed and healthier animals. The series was developed with decades of know-how in hay drying especially for the harsh agricultural requirements and is produced in Austria.

The installed and used technology corresponds to an industrial standard and we constantly develop our devices to the current state of the art.

The integrated control adjusts the compressor continuously to the currently ideal operating point on the basis of the current air temperature and humidity by means of the integrated frequency converter.

		typische Boxenfläche																																																									
		30 m²	40 m²	50 m²	60 m²	70 m²	80 m²	90 m²	100 m²	110 m²	120 m²	130 m²	140 m²	150 m²	160 m²	170 m²	180 m²	190 m²	200 m²	210 m²	220 m²	230 m²	240 m²	250 m²	260 m²	270 m²	280 m²	290 m²	300 m²	310 m²	320 m²	330 m²	340 m²	350 m²	360 m²	370 m²	380 m²	390 m²	400 m²	410 m²	420 m²																		
Auswahltable LASCO Powerline Luftentfeuchter		Helios																																																									
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Some benefits

The LASCO Powerline series has it all!

some highlights!

optimized fin spacing:

Air flow, dripping and heat transfer are perfectly integrated in the POWERLINE series. The heat exchanger is made of aluminium and the use of light metal ensures excellent drainage of the water obtained. With fin spacings of 2.4mm on the condenser and 4mm on the evaporator, we achieve ideal efficiencies while at the same time reducing the risk of contamination.

Compressor technology:

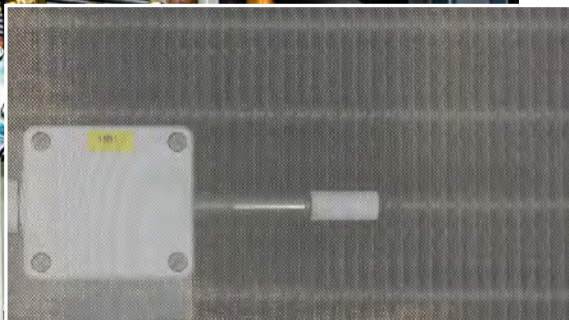
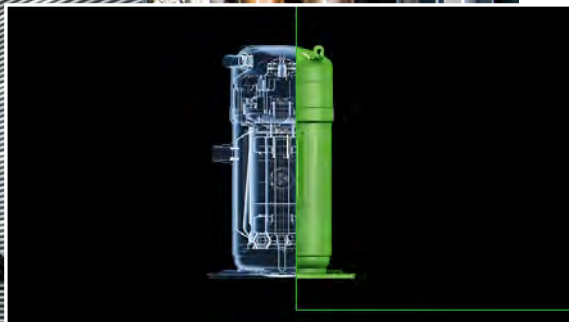
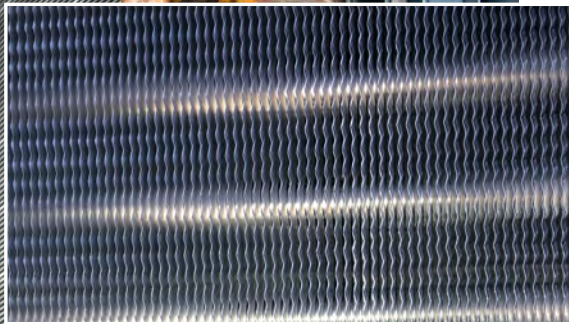
The compressors used by us are hermetic scroll compressors of the German brand manufacturer Bitzer. In addition to maximum efficiency, cooling capacity and outstanding running smoothness, those been characterised by absolute reliability. Thanks to the intelligent design, Bitzer compressors require a fewer number of moving parts, which ensures a long service life.

Compressor technology:

The fine-meshed grid protects the fins from dirt. It is easy to clean and remove. Also in the picture: Temperature and humidity sensor. These sensors form the basis for cold control and are located directly in the air flow.

Control unit:

The control unit with display is decoupled from the control cabinet of the Powerline device and can be mounted separately from the basic unit. Mostly, in the field this is mounted next to the drying control device.



System visualization

While developing the new high-performance dehumidifiers, we have paid maximum attention to flexibility.

This

allows the device components to be installed on individual base. Thus, unnecessary costs can be avoided. The following

installation schemes provide a schematic overview of the individual installation options. Please contact us for further details on the drying process.

Version 1

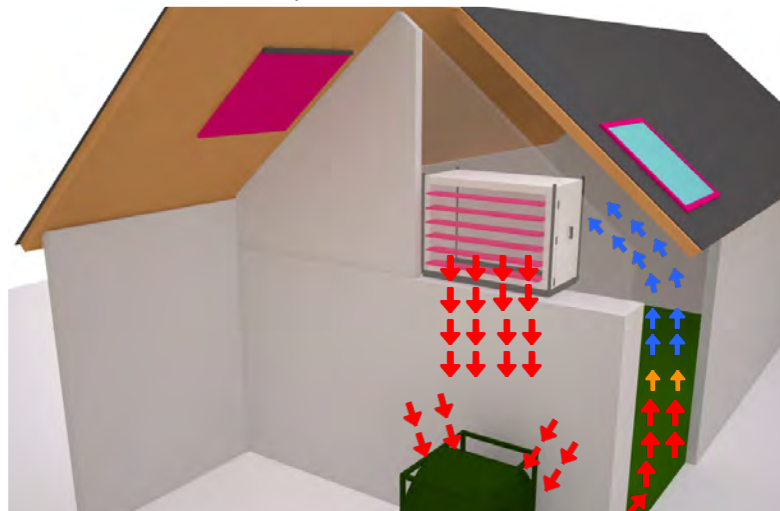
This installation variant is very easy to produce, as the LASCO high-performance air dehumidifier

already has its own optional change-over flap and therefore no external air, i.e. air

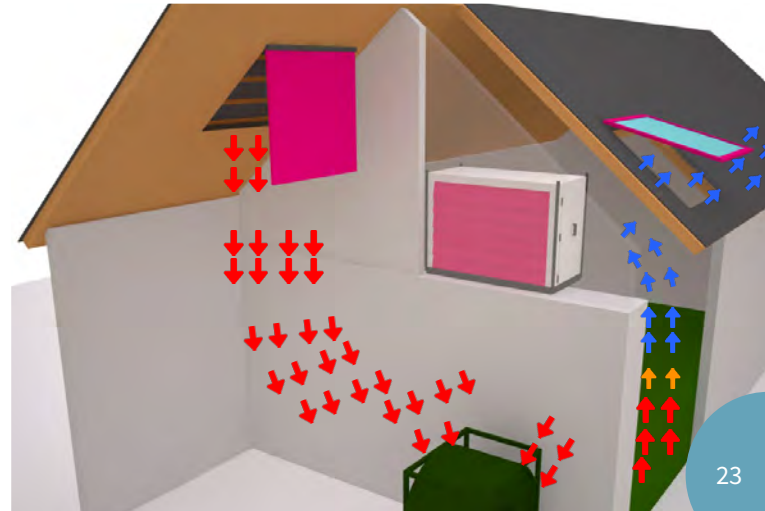
from the hay stock, can be sucked in during roof extraction operation. If there is no hood suction, a fresh air

window

can be opened or closed instead.



Drying scheme for recirculation with inactive hood suction
The entire drying air will be sucked passing over the dehumidifier.

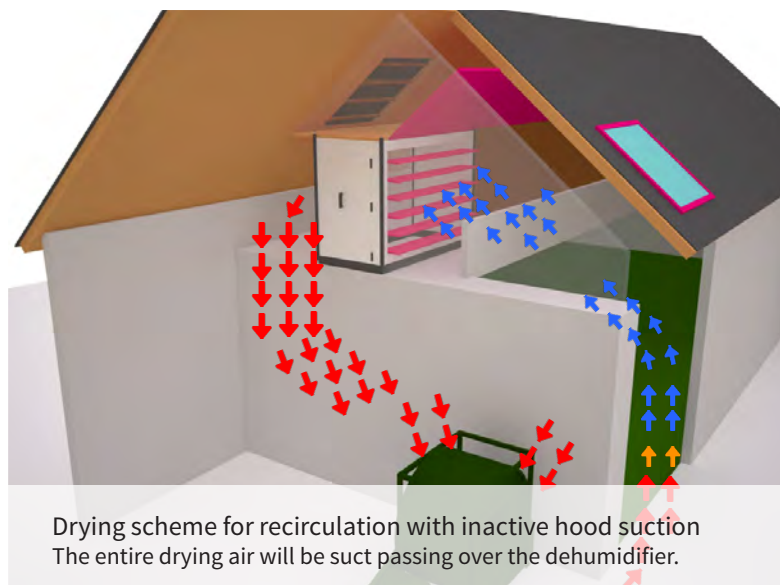


Drying scheme for recirculation with inactive dehumidifier
Here, flaps on the dehumidifier are closed.

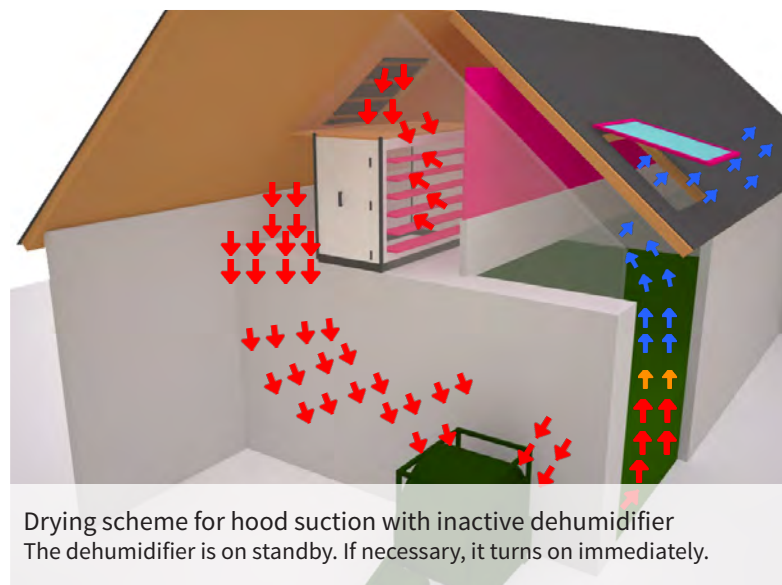
Version 2

This installation version is the premier class, as the hood suction air is passing over the dehumidifier.

This has the advantage that the dehumidifier starts working immediately in the event of a heat storm and the associated poor drying air.

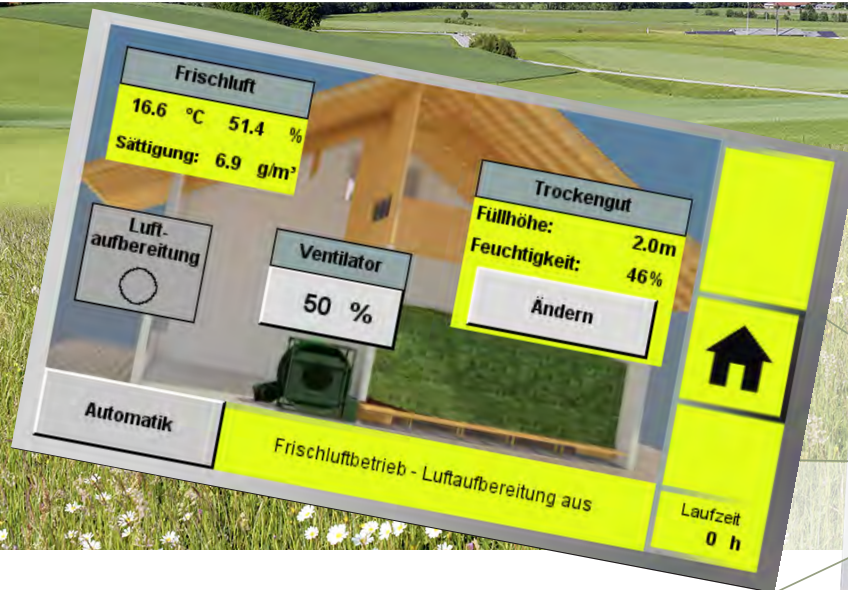


Drying scheme for recirculation with inactive hood suction
The entire drying air will be sucked passing over the dehumidifier.



Drying scheme for hood suction with inactive dehumidifier
The dehumidifier is on standby. If necessary, it turns on immediately.

Effizient und schnell trocknen. LASCO Trocknungssteuerung



Our drying control devices are designed for small drying plants and leave no questions unanswered for large projects. Our customers can choose among three different control systems depending on their requirements, customer wishes and the complexity of the project.

Our controls make the drying process more economical and visible.

The LASCO drying controls were specially developed for energy-efficient use in complex hay drying and combination drying processes. Depending on the quality of the drying air, the system is able to change the operating conditions so that drying is possible even in poor outdoor air conditions. On one hand this is achieved by the automatic request of drying equipment (automatic start of the drying equipment) and on the other hand by the change of the air guidance of fresh air/hood suction on recirculating air.

The sensors installed in the system provide the necessary information. Using this information, the operator can draw conclusions about the current drying progress.



The control device automatically switches from fresh air to circulating air operation by means of a lifting cylinder.



Willkommen in Ihrer Trocknungszentrale

HB 500		HB 4000	HB 5000
Basic		Standard	Premium
<ul style="list-style-type: none"> • 4.3" Touch display • Indicator light for operation, fault • Number of possible boxes: 1 • Star-delta start-up (up to 15kW) • optional frequency converter • Start/stop air treatment • compatible with dehumidifiers • compatible with warm air units • Heating register actuation • Remote maintenance via VNC • Remote access via PC or mobile phone • Data logging/recording • fresh air sensor 		<ul style="list-style-type: none"> • 5.7" Touch display • Number of possible boxes: 2 • Actuation of up to 2 hay boxes • automatic changeover fresh air & circulating air • electrical flap control for drying boxes: Yes • Speed control • Start/stop air treatment • compatible with dehumidifiers • compatible with warm air units • Heating register actuation • Remote maintenance via VNC • Remote access via PC or mobile phone • Data logging/recording • Fresh air sensor • Exhaust air sensor • Differential pressure sensor • Dry air sensor • Air velocity sensor 	<ul style="list-style-type: none"> • 10.1" Touch display • Number of possible boxes: 6 • Actuation of up to 6 hay boxes • automatic changeover fresh air & circulating air • electrical flap control for drying boxes: Yes • Speed control • Start/stop air treatment • compatible with dehumidifiers • compatible with warm air units • Heating register actuation • Remote maintenance via VNC • Remote access via PC or mobile phone • Data logging/recording • Fresh air sensor • Exhaust air sensor • Differential pressure sensor • Dry air sensor • Air velocity sensor • second fresh air flap prepared

Each drying control device can be remotely maintained via smartphone or tablet.

Accessories

LASCO Temperature and humidity meter

This digital device measures temperature and humidity in the drying material. There is a round bale version with a length of 50 cm as well as a haystack version with a length of 2 m.



LASCO air velocity meter

The unit can be used to achieve ideal air velocities during dehumidifier operation in case no HB4000 drying control device with air velocity sensor is available.



LASCO warm air hoses

Isolated and non-isolated versions are available in different sizes.



LASCO fire damper

There are different versions from 400mm - 1000mm Ø.



Founded in 1987 as a family business, since that time we have been constructing and selling agricultural machines at several locations, which are now being exported all over the world.

Customers and partners appreciate our close cooperation. By doing so, a remarkable range of products were created consisting of:

- Drying technology
- Hay technology
- Forestry equipment

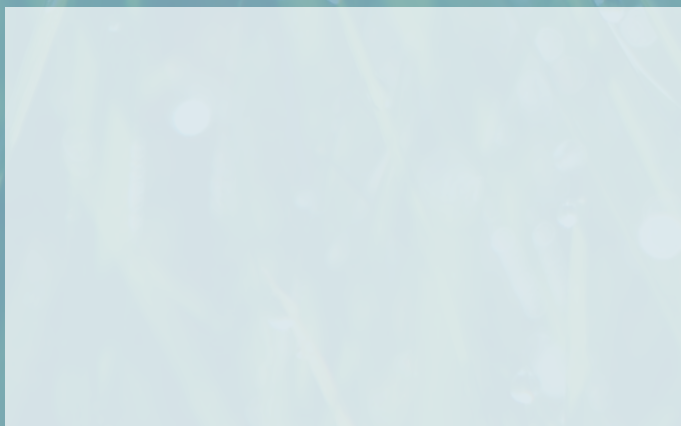
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Your local contact:



LASCO Heutechnik GmbH

Lascostraße 1
A-4891 Pöndorf (near Salzburg)

Telephone: +43 (0)7684 / 21 666
Fax: +43 (0)7684 / 21666-4

Email: office@lasco.at
Web: www.lasco.at

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