



Modern crimping technology



Productivity in harmony with nature

Crimping - for successful farming



Why is crimping profitable?



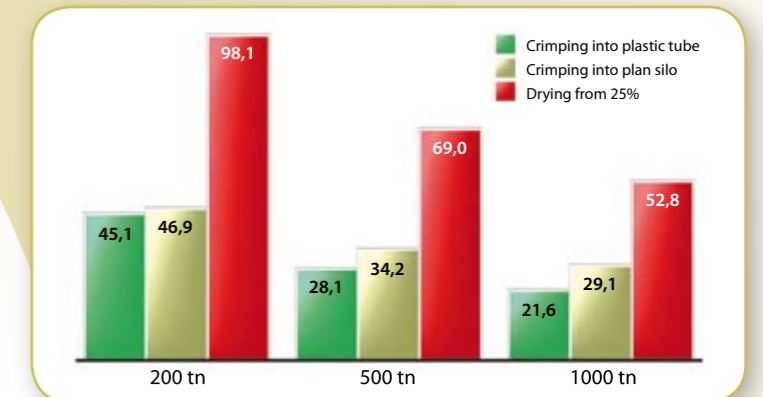
- No drying costs
- Lower labour costs
- Appetising feed
- Less reliant on weather
- Longer threshing period
- Up to 30% larger grain harvest (dry matter)
- Improved feed/straw value
- You can adopt higher yield varieties
- You can thresh three weeks earlier, at a time of highest nutrient content

By crimping into a plastic tube...

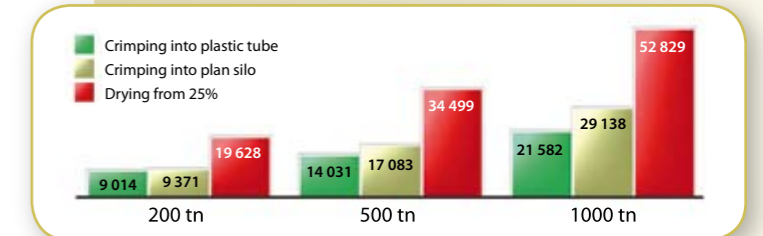
- No need for silos or dryers
- It takes just one operation to crimp and preserve the grain
- Quick and easy
- Your grain preservation system gives optimum productivity

Financial gain from crimping!

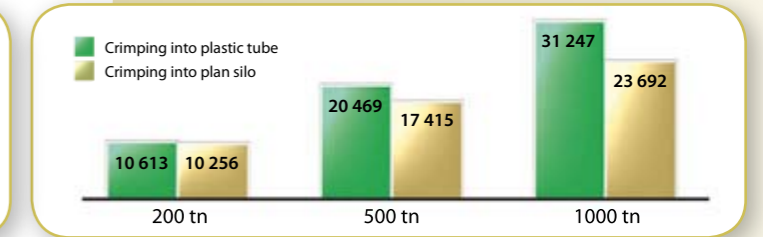
Preservation costs: EUR/ton



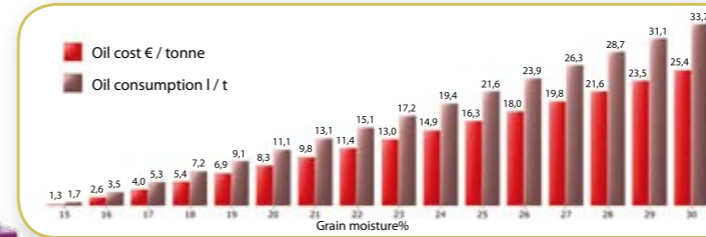
Total cost / EUR



Saving compared to drying / EUR



Drying Oil consumption liters and € / tonne



used for calculation of oil consumption 125 g / of 1 kg evaporated water. Oil price of 75.4 cents / liter (88.6 cents (VAT 0%) -13.2 cents energy tax deduction)

Source: TTS 01/2013

Tube crimping is the modern alternative!

- “Visibly more appetising feed. The preservation rate is 100% and the tube is much easier to unpack than I expected” Esko Viitala, Jalasjärvi, Finland
- “Keeps well and is easy to unpack” Kari Metso, Anjalankoski, Finland
- “The ultimate grain crimping method. It’s easy to remove from the sack with a narrow bucket” Ari Härmä, Liminkai, Finland
- “Excellent feed for pigs, distributed by liquid feeder. Crimping into a tube suits us well” Teuvo Tikkanen, Nivalai, Finland
- “Dust-free, good feed at a reasonable cost” Vesa Pasanen, Kiuruvesi, Finland
- “The system works efficiently, and there’s no need for silo structures. Appetising feed” Jari Laukkonen, Korttesjärvi, Finland
- “Cost-effective, good feed. No need to invest in silos, harvesting is quick with a long harvest period. The mix feeder distributes the feed automatically” Jukka Rahja, Kalajoki





High quality cost-effective feed

Crimping is a cost-effective way to produce high-quality feed for all livestock. It improves profitability of the farm by reducing costs of investments (dryer, storage) and energy (oil, electricity). Production costs of crimped grain are much lower than those of dried grain.

Crimped grain is ready to feed without any further processing. It can be used directly from the storage for feeding as such or as a component of Total Mixed Rations (TMR) for cattle or in liquid feed for pigs. Ensiling of crimped grain is based on lactic acid fermentation by lactic acid bacteria. Favourable environment for lactic acid fermentation is created by lowering the pH of crimped grain to the level of 4 and by anaerobic conditions.

Cultivation technique and harvesting

Grain for crimping can be cultivated similarly to grain for drying, but it is harvested 2–3 weeks earlier at the yellowish stage when the grain's energy content and protein content are at their highest. Early harvesting allows cultivation of late varieties with higher yield potential. Fertilization is also more flexible and manure can be used more freely. Grain at the yellowish stage is softer and bigger than at the mature stage. The moisture content of the grain is typically 30–40%.

Crimping and ensiling

A specialized Murska crimping machine is used to process the grain. Add the crimping additive into the crimping machine to achieve good mixing of additive in the grain.



Crimped grain with high moisture content is easy to consolidate to exclude air. If the grain is crimped in the field, it is unloaded directly from the combine into the crimper, crimped, and at the same time the additive is added. Finally, crimped grain is lifted with elevator to the trailer and transported to the storage site.

Storage

Crimped grain can be stored in plastic tubes, bunker/horizontal silos, clamps or airtight tower silos.

High-value low-cost feed with crimping

- Crimped grain has high nutritive value.
- Crimped grain fits perfectly in total mixed rations.
- Crimped grain can be used for all livestock.
- Cost per energy unit of crimped grain is lower than that of dried grain.
- Phosphorus utilization in pigs and poultry fed with crimped grain is better than in those fed with dried grain
- Crimped grain fits well in liquid feeding systems.
- Crimped grain is dust free.
- Crimping is a low-energy method of processing feed grain.
- Crimping allows the use of later cereal and maize varieties; harvesting even under unfavourable weather conditions.
- Drying capacity does not limit harvesting.
- Crimping extends the operating time of combines in the autumn.

Valuable and low-cost feed for all livestock

Despite of the earlier harvesting time, the nutrient content of crimped grain is similar to that of the grain harvested at full mature stage.

Ruminants

Beef cattle grow as well or even faster with crimped grain as compared to dried grain. Several studies have confirmed that dairy cows produce as much milk with crimped grain as with dried grain. Overall nutritive value of crimped grain for ruminants is similar to that of dried grain.



The actual amounts of crimped grain fed or used in TMR are higher than those of dried grain due to lower dry matter content of crimped grain. Otherwise crimped grain can be fed as dry grain and it can completely replace dry grain in feeding.

Pigs

Crimped grain can be fed to pigs as such. It fits perfectly for liquid feeding. In practice, 8–10% variation in dry matter content of grain does not affect the daily growth or the feed conversion ratio. Vitamin E content is lower in crimped grain. In practice, crimped grain can fully replace dried grain in the feeding of pigs.



Poultry

Crimped grain as such is palatable feed for poultry, too. Crimped grain improves both daily weight gain and feed conversion ratio of broiler chickens. This is related to the 25% higher energy value of crimped grain as compared to that of dried grain. Energy value is increased due to the lower β -glucan content in crimped grain resulting in lower gut content viscosity. This effect is similar to that of β -glucanase enzyme. Digestibility of lysine and threonine are increased in broilers fed crimped grain as compared to those fed dried grain. Similarly to pigs, digestibility of phosphorus is increased, too.



Crimping in a nut shell

- Harvest 2 to 3 weeks earlier than normally at yellowish stage; optimal grain moisture 30–40%.
- Crimp on the field or at the storage with Murska crimper.
- Use additive 3–5 liters per ton.
- Store in bunker silos, plastic clamps, bags or tower silos.
- Remember careful consolidation, covering and weighing.
- Feeding can start about 3 weeks after closing the silo.

New **W-**crimping technology

Murska's ode to efficiency and usability

- Murska W-Max is a power mill, designed to meet the user's every need. W-Max will achieve almost 60 tonnes/hour (maize) performance at low energy need. The new grinding crimping technology gives perfect results.
- The W-roller can be used on all feed grains, whether dry or harvest-moist: oats, barley, wheat, maize, peas, beans and mixed grains.
- Suitable especially for crimping mixtures of grains / beans and peas.
- The optional control system facilitates use. The mill has automatic fill control, and preservative dosing is based on the moisture content of the grain. When the work is complete, the system sends a report to a mobile phone, and the contractor can attach it to his invoice. The report details the time spent, the amount of preservative added and the total volume of the crimped cereal. The system will also produce interim data. The control system takes care of user and machine security. In the event of a disruption, the mill alerts the user and stops the supply of grain.
- Murska W-Max is really fun to use. It is capable of carrying a large volume of preservative. It is easy to adjust the crimping level, but this is seldom necessary. The service points are easily accessible. The advanced control system allows the user to stop thinking about the preservative dosage and the crimped tons of grain. Is there any easier way to preserve grain?

W-Max



W-Max 20C

Murska W-Max 20 Contractor is a high-performance professional product, designed to the last detail. Drawn by a tractor, the mill runs smoothly and comfortably along the bumpiest of roads, thanks to a spring bogie. It accommodates up to 1,800 litres of additive. There is a wide range of transporter options.



W-Max 10 C with Bagger

W-Max 10C

The Murska W-Max 10 Contractor is designed for use by contractors. This model is equipped with a bagger. The capacity is well sufficient for field work with two combine harvesters equipped with ca. 4 m cutter bars.

W-Max 10F

The Murska W-Max 10 Farmer is designed for use on a single farm. It incorporates a three-point linkage. The mill has the same capacity as the 10 C.



Efficient and easy to use!

Model	W-Max 10 F	W-Max 10 C	W-Max 20 C
Capacity t/h	10-30 t/h	10-30 t/h	25-60 t/h
Transmission	1000 rpm	1000 rpm	1000 rpm
Weight / kg	1000 kg	1900 kg	2900 kg
Hopper volume with additional storage	2800 l	2800 l	6500 l



The roller mill for successful farming!

Murska roller mills have become known for their power and their durable rollers. Murska machines are easy to use and maintain. Operating reliability has been confirmed globally in all conditions and circumstances.

The Murska factory will not abandon you if service is required unexpectedly when you're busy working. Our efficient repair service and fast spare parts deliveries mean less downtime.

Murska's experience in crimping goes back to 1969.

Diverse range of equipment

- Trailer chassis for Murska 350-1000 roller mills
- Bagger tube packing machine
- Acid bottle stand for a 200 litre barrel with hoist
- Additional hopper
- Range of rollers: 2 mm and 3 mm groove pattern and spot flute
- Three times more operating time with super rollers



New!

Bogie trailer for Murska 1400 and 2000

Murska 350 S2

The mill has three-point linkage and it is generally powered by a tractor. Power requirement is 30-40 hp, and 15 kW with an electric motor. Wet grain crimping capacity is 5 t/h, while with dry grain it is 3-10 t/h, depending on the roller surface.

Murska 700 HD

The smallest HD model is the Murska 700 HD, which is excellent on medium-sized and slightly larger farms. The mill incorporates gear-driven specially hardened rollers, which will crimp millions of kilos of feed grain. Wet grain capacity is 10 t/h, while with dry grain it is 8-20 t/h, depending on roller surface.

Tractor power requirement is 70-80 hp.



For larger farms and contract work and for sharing.

Murska 1000 HD

A larger model in the HD range, the 1000 HD looks the same as the 700 HD and has the same technical specifications, but it is equipped with longer rollers and a larger elevator tube. Crimping capacity for wet grain is approximately 15 t/h. The efficient operation of the Murska 1000 HD requires an 80-90 hp tractor. The mill is capable of milling almost 30 t/h of dry grain with 2 mm grooved rollers.

The Murska 350-1000 mills may be fitted with a transport chassis, equipped with optional two stands for 200 litre acid bottles and a hoist.

Murska 1400 S 2x2

The Murska 1400 S 2x2 is equipped with a unique roller cassette, driven by four gears, achieving a crimping capacity of up to 20 t/h. The tractor power requirement is 140 hp. The mill has an air-spring transport chassis, enabling quick changes between work locations. Standard equipment includes hydraulic elevator tilt, working lights and a tool box. The Murska 1400 S 2x2 is an ideal machine for crimping large quantities of feed grain in a short space of time.

Murska 2000 S 2x2

The technical specifications of the Murska 2000 S 2x2 are the same as for its smaller version, the 1400 S 2x2, but with enhanced crimping capacity of 30 t/h. This is usually enough for even the busiest farmer or contractor. A wise choice, if time is of the essence.



Equip your roller mill with a tube packing machine

Preserving grain in a plastic tube is a cost-effective and easy solution - No need to invest in expensive silos and building projects

The Murska roller mill equipped with a bagger crimps, adds preservative and packs the harvest-moist grain into an airtight plastic tube - all in a single operation. The crimped grain is ready-to-feed fodder, suitable for all livestock. The tube can be filled to a length of 60m, meaning that a sack measuring ø2.0 m will accommodate around 180 m³ of high-quality compacted grain. The opening in the sack is easy to manage, and suitable also for minor consumption.

Tube packaging comes into its own especially on farms which buy in some of its grain feed. Often, grain is delivered irregularly, and there can be a break of several days in the crimping operation. In the case of tubing, preservation can be interrupted without any additional work phases.

Murska Bagger

The Murska Bagger is a separate packing machine that can be connected to a mill or a loading hopper. A bagger with a loading hopper can be used to preserve not just grain, but other materials as well.

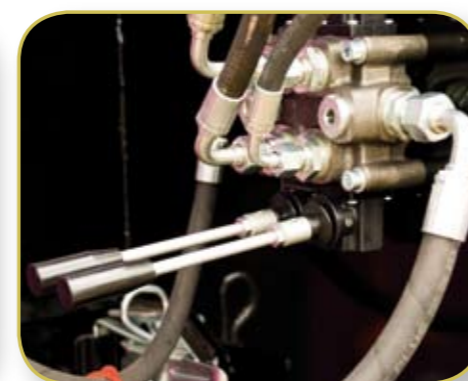
Murska models that can be equipped with a tube packing machine

- Murska 350 S2
- Murska 700 HD
- Murska 1000 HD
- Murska 1400 S 2x2
- Murska 2000 S 2x2
- Murska W-Max 10
- Murska W-Max 20



New!

Bogie trailer for Murska 1400 and 2000



Technical specifications



Model	350 S2	700 HD	1000HD	1400 S2x2	2000 S2x2
Capacity t/h	5-10 t/h	10-15 t/h	15-20 t/h	20-40 t/h	30-50 t/h
Transmission	540 rpm	540 rpm	540 rpm	540 rpm	540 rpm
Weight / kg	600 kg	1100 kg	1400 kg	2900 kg	3300 kg
Hopper volume with additional storage	1900 l	2700 l	3300 l	5500 l	5500 l

Murska crimp filling device

- The Murska crimp feeder can be used in conjunction with a feed cart on rails, a fixed feed mixer or a liquid feed distributor, etc.
- Because the crimp feeder is equipped for electricity, it is easy to place in use
- The hopper's front and back panels can be opened



Murska crimp feeder

- The automatic Crimp Filler provides intermediate storage for crimped grain and dry grain, for instance, as well as acting as a filling device for feeders
- A robust 6 m³ hopper
- Twin-lane grain transfer from hopper to conveyor screw.
- A reliable elevator conveyor from hopper to feeder

Technical specifications

Base conveyor	2,2 kW + 1,5 kW
Elevator conveyor	2,2 kW
Hopper volume	6,0 m ³
Base conveyor chain	Evert 74



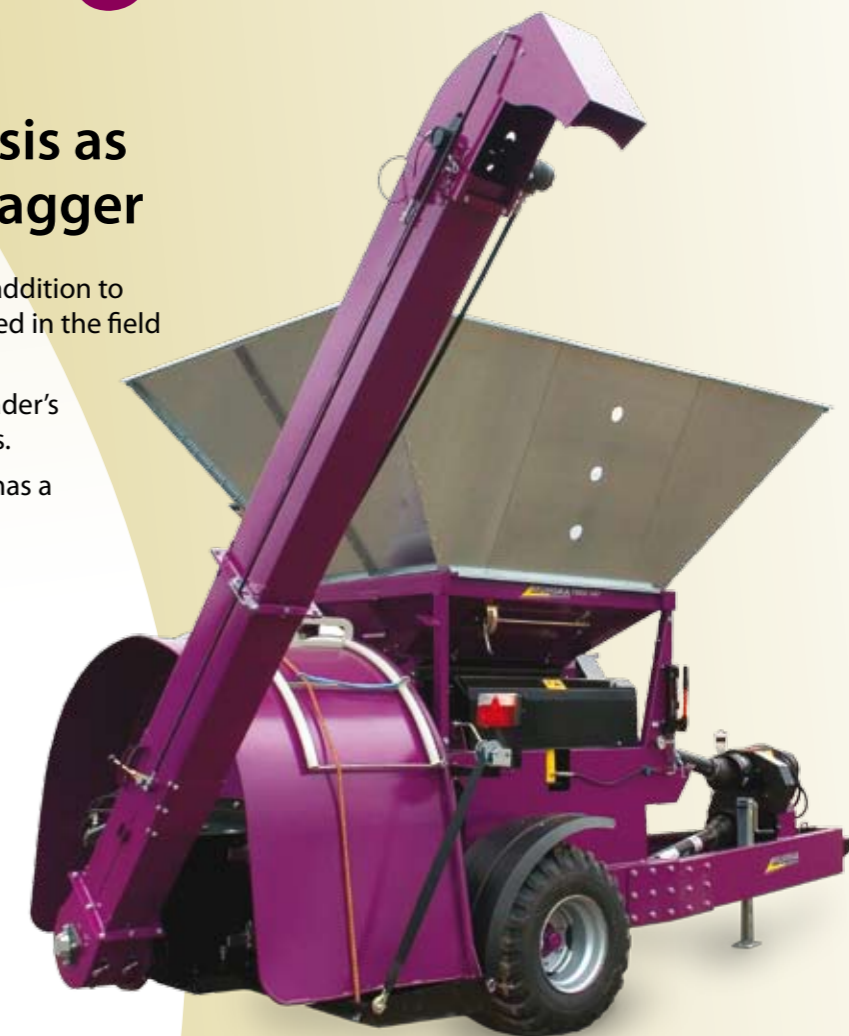
Murska Rear elevator - elevator transport chassis as optional extra for the bagger

For situations where an elevator is necessary in addition to the bagger, for instance when the grain is crimped in the field directly from the harvester to the cart.

Assembly is easy, using for example the front loader's lifting forks. Attachment is by quick-hitch latches.

The elevator is driven by a hydraulic motor and has a hydraulic cylinder tilt.

The rear elevator fits all bagger models.



Productivity in harmony with nature

Murska Fill Device - universal transporter for farms

The filling device transfers the grain to the roller mill, the trailer, the lorry or the silo, removing the need for another work phase, i.e. using a loader.

The grain remains cleaner and there is less wear and tear on the grain screws and mill rollers.

The filler's output is approximately 60 t/h.



Capacity around 60 t/h.



Filler-roller mill filling the bagger



Large hopper



The filling device is easy to transport

Murska roller mills for the processing of dry and acidified feed grain

The roller mill is used to crimp dry grain, to produce groat, which is more suitable for livestock feed.

The Murska 220 SM is a top-of-the-range, modern roller mill for crimping dry and propionic-acid grain. It is the result of long-term product development and is equally at home in the feeding automation chain or as part of a hand feeding system.

The rollers are at the heart of the mill, and consequently they have been the focus of special attention. They are spring-loaded, gear-driven (with both rollers driving) and hardened. Shield magnets protect the rollers from the metal.

The roller surface is optionally either spot fluted or 2 mm grooved. Spot fluted rollers are suitable for use with dry and acid grain. The 2 mm grooved rollers will also crimp pea mixes.

Because it is possible to run the Murska 220 SM with grain between the rollers, it can also be installed directly underneath a silo.



Murska 220 SM
600-1500 kg/h



Murska 220 SM Super

Effective electric motor-driven roller mill into a mixed ration or a feeding automation chain.



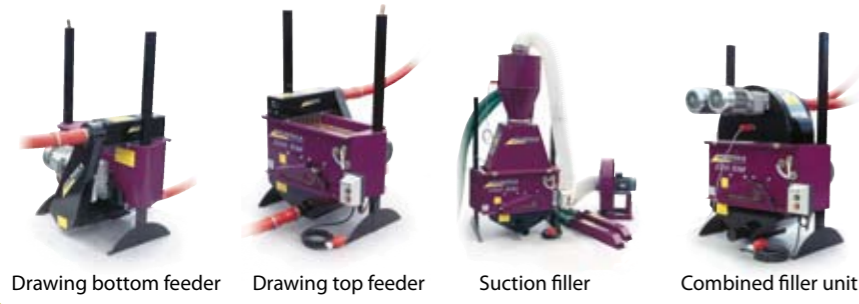
Murska 220 SM Super
1500-3000 kg/h

Throughput
even 3000 kg/h

MURSKA 220 SM	
Throughput	600-1500 kg/h
Power requirement	4 kW
Height	650-1300 mm
Width	600 mm
Length	830 mm
Weight	180 kg
Hopper volume	20 l
Shield magnets	2 x ø80 mm

MURSKA 220 SM SUPER	
Throughput	1500-3000 kg/h
Power requirement	9,2 kW
Height	950-1300 mm
Width	750 mm
Length	1100 mm
Weight	255 kg
Suppilon tilavuus	20 l
Shield magnets	2 x ø80 mm

Diverse range of equipment for transferring grain to/from the mill



Drawing bottom feeder Drawing top feeder Suction filler Combined filler unit

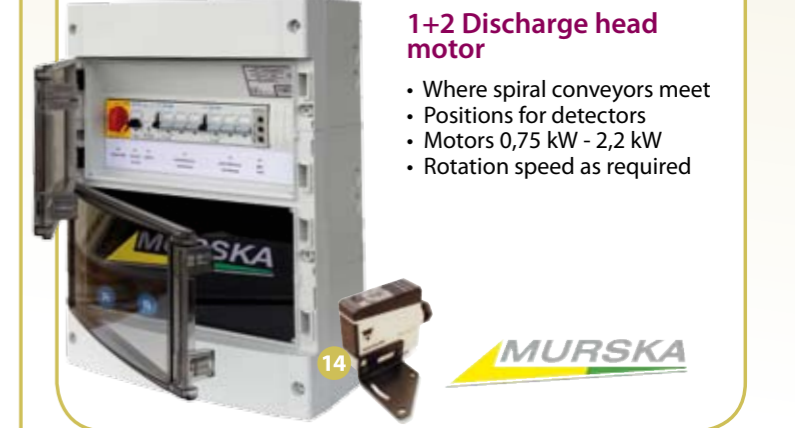


Murska spiral parts

- Interim discharge point, open model
- Interim discharge point, with seal
- Pipe coupling
- Spiral for ø75/ø110 mm pipe
- HD-spiral pipe: bend 45°, ø75/ø110 mm
- HD-spiral pipe: straight ø75/ø110 mm
- Silo bottom hopper with fill adjustment
- Silo bottom hopper with fill adjustment, round
- Fill head for spiral, adjustable fill volume
- Fill head for spiral, with bearings
- Discharge head, with bearings
- Discharge head motor
- 1+2 Discharge head motor
- Control centres and detectors



Discharge head motor
• Motors 0,75 kW - 2,2 kW
• Rotation speed as required

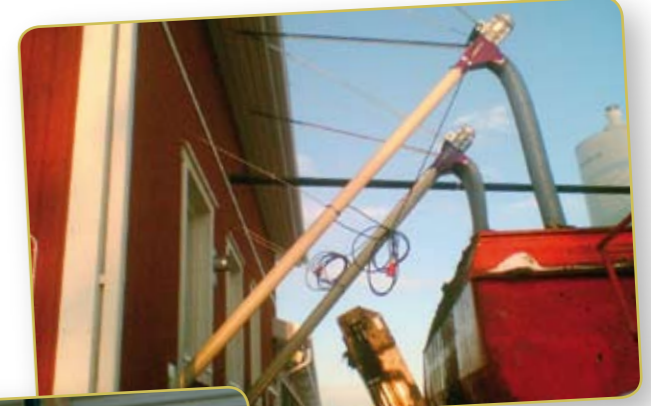


1+2 Discharge head motor
• Where spiral conveyors meet
• Positions for detectors
• Motors 0,75 kW - 2,2 kW
• Rotation speed as required

Murska straight conveyor - effective grain transfer

The Murska straight conveyor is an effective solution for the transfer of feed grain and feed.

- Gentle - does not break the grains
- Lightweight
- Low power requirement – quiet operation
- Size and accessories according to need (length 2-12 m)



Straight conveyors filling a feeder cart



HD-spiral conveyor to the milking robot and the feed cart



Murska Biopacker - equipment, plastics and consultations

Tube composting – inexpensive and quick

Tube composting is an environmentally friendly way to transform manure into nutritious full soil. Air exchange by ventilators and the heating effect of black plastic foil will intensify composting in the tube. The mass is reduced by about one third and it becomes hygienic, homogenous and inodorous.

Why to compost in a tube?

In tube composting an insulated floor or drain basin are not needed. By tube composting, handling of waste is simple and quick.

Tube composting is suitable, for instance, for composting of horse or chicken manure. Murska Biopacker has a wide packing channel and heavy duty packing worms and thus stones, pieces of wood and other things do not disturb the packing process.

Effective composting

Screw packers

- Diameter 570 mm
- Material 8 mm wear resistant steel

Hydraulically operated

- Funnel can be lifted and lowered, which helps in keeping the machine clean
- Control brake for packing density
- Base of the tube
- Hydraulic brakes

Air suspended platform
Capacity requirement 85 kW



Murska **Biopacker**

RAJU-Quick Lock



Double is better!

RAJU
rajuvanteeet.fi

By using the twin wheels the harmful compaction of soil may be reduced and thus the crop-production capacity of the soil may be improved.

- Nice to fit and release
- Heavy duty - needs less
- Safe
- Lasts from father to son

The method for successful farming



Over 40 years
of productivity in harmony with nature

Founder of the company Aimo Korte
and his first crimper 1969.

MURSKA

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