MURSKA®

Disc, Roller and Hammer Mills for

Grain Crimping

Better quality fodder – Easy storage – No extra drying costs

ENG

Grain crimping

How does it work?

Grain crimping is an organic way to preserve feed grain into livestock fodder by fermentation. Crimped grain enhances animal health and saves costs in farming, harvesting, drying and storage of crops.
In the crimping process the grain is combined moist and run through a specialized Murska Roller or Disc mill, which breaks and flattens the grains. Additives like preservatives or inoculants, are used typically 3–5 litres per ton. Crimped grain is stored in airtight plastic tubes, bunkers, horizontal silos, clamps or tower silos.

Harvesting

Grain for crimping is cultivated similarly to grain for drying, but it is harvested 2–3 weeks earlier at the yellowish stage. The moisture content of the grain is typically 30–40 %. The grain´s energy and protein content are at the highest at that time. Early harvesting allows cultivation of late varieties with higher yield potential. Harvesting can be made even in less favorable weather conditions.

Crimping

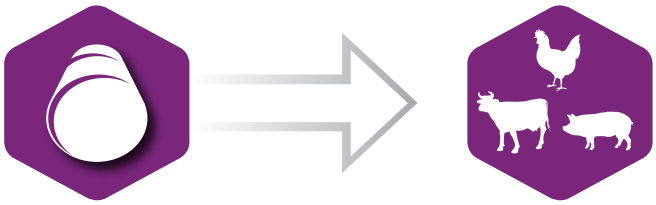
No drying of grain is needed before crimping, thus saving a lot of energy. You can crimp moisture grain directly from the combine harvester. A Murska mill is used to process the grain. Crimping can be done on the field or at the farm yard depending on the storage like a plastic tube or a silo. Crimping creates much less dust and noise than milling dry grains.

Better quality fodder – Easy storage – No extra drying costs

Grain crimping was invented over 50 years ago

Grain crimping was invented in autumn 1969 in the farm of Aimo and Gunnar Korte in Ylivieska, Finland. Their grain dryer had broken, but the brothers were aware that high moisture grains could be ensiled, but it should have been crimped first. This method was made famous by a Finnish Nobel winning chemist Artturi Ilmari Virtanen a couple of decades earlier, but it was usually used for hay silage. There were no crimping machines available at that time, so they decided to construct one on their own. The first roller mill was made together with a neighbour farm. This is how the company Aimo Kortteen Konepaja Oy started.

MURSKA 50 YEARS



Storage

The crimped grain fodder is stored in airtight plastic tube, horizontal silo, clamp or tower silo. Ensiling of crimped grain is based on lactic acid fermentation by lactic acid bacteria. Favourable environment for fermentation is created by lowering the pH of crimped grain to the level of 4 and by anaerobic conditions.

Feeding

Crimped grain is excellent fodder for ruminants, pigs and poultry. Crimped grain can be fed to the animals as such, in TMR for cattle or in liquid feeding for pigs. Nutricient value of crimped grain is higher and toxin levels are lower than dried grain.

Contents

Grain crimping

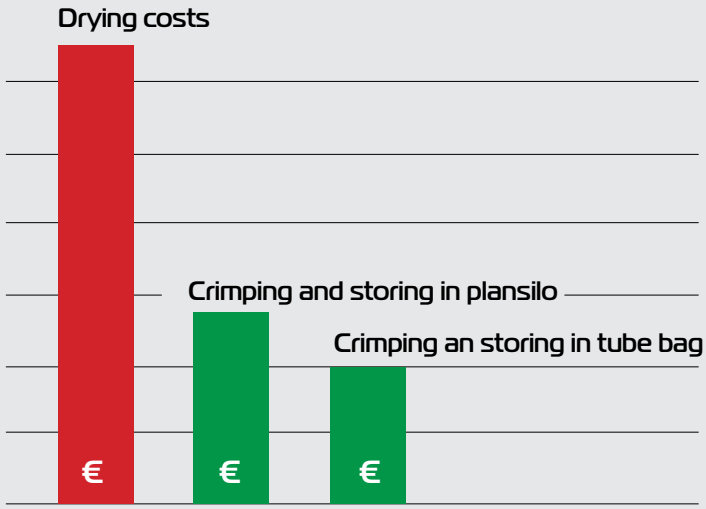
Benefits for you

Grain crimping is a cost-effective way to produce high-quality feed for all livestock. It improves profitability by both reducing costs and increasing yield. You can crimp practically any crops like oats, barley, wheat, maize, peas, beans and mixed grains.

Benefits for you

- No drying costs
- Appetising and nutritive feed
- Lower labour costs
- Up to 30% larger grain harvest
- Reduced mycotoxin levels
- Harvest 2 to 3 weeks earlier, optimal moisture 30–45 %
- Longer threshing period, less weather-reliant
- You can start feeding about 3 weeks after closing the silo
- Half the preservation costs compared to drying of grain

Example chart of preservation costs on a farm.



Make your own calculations on our website:

www.murska.fi/energialaskuri

Appetising and nutritive feed

Beef and dairy cattle

Overall nutritive value of crimped grain for ruminants is better compared to dried grain and it can completely replace dry grain in feeding. According to several studies, crimped corn can achieve up to 11 % increase in milk production of dairy cows and 6 % increase in daily growth of beef cattle.

Pigs

Crimped grain can be fed to pigs as such. It fits perfectly for liquid feeding too. Content of vitamin E is lower in crimped grain, but digestibility of phosphorus is increased.

Poultry

Crimped grain as such is palatable feed for poultry. Crimped grain improves both daily weight gain and feed conversion ratio of broiler chickens, as the energy value of crimped grain is 25% higher compared to that of dried grain. Digestibility of lysine, threonine and phosphorus are increased in broilers fed with crimped grain as compared to those fed dried grain.

Best practices – Store crimped grain in a plastic tube

Bagging of crimped grain in plastic tubes is a low-cost and simple storage method. No fixed storages are needed and size of the tubes can be adjusted according to the yield. Working is flexible as crimping can be stopped at any time and continued later. Bagging is also fast, easy and less weather dependent than ensiling in silos or clamps.

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Disc Mills

W-Crimping technology

Murska W-Max is a series of powerful disc mills designed to mill both dry and moisture grain. The biggest W-Max 40 achieves up to 100 tonnes/hour performance (maize) at low energy needs. The disc grinding technology gives perfect results for every customer's need, especially in pig farming.
The disc mill can be used on all feed grains, whether dry or harvest-moist: oats, barley, wheat, maize, peas, beans and mixed grains. Murska W-Max is comfortably quiet and really fun to use. It is capable of carrying a large volume of preservatives. It is easy to adjust the crimping level, but this is seldom necessary. The service points are easily accessible.
The advanced Murska Data control system allows the user to stop thinking about the preservative dosage and the crimped tons of grain. Murska Data also controls the co-operation of the crimper and the tractor. Is there any easier way to preserve grain?

Extreme efficiency
W-Max 40

Murska W-Max 40 is a high-performance professional product, designed to the last detail. Capacity is up to 100 tn/h with maize and up to 80 tn/h with high moisture grains. The machine uses the same reliable W-Max technology as the Murska W-Max 20. The mill can be equipped with a tube bagging unit or a belt conveyor.

Watch a video of disc mill in action

Surprising performance
W-Max 20.22C

Murska W-Max 20C 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 2800 litres of additive. There is a wide range of transporter options. The capacity is 50 t/h.

Favorite model
W-Max 10

A capacity is up to 20 tonnes/hr of harvest-moist grain.
A tube packing machine or 3-4 m discharge elevator can be placed on the multipurpose chassis.

New Murska Data control system

The optional Murska Data control system makes milling and crimping easy. The Murska Data control system facilitates a 7 inch touch screen, which has clear visibility in all conditions. The system has an improved Auto-drive mode, which automatically takes care of feeding the mill and dosing of preservatives based on the moisture content of the grain. When the work is complete the system sends a report including the total volume of the crimped cereal, amount of preservative added and the time spent. Murska Data also enhances the safety of the operator and the machine, as the mill alerts the user and stops the supply of grain in the event of disruption.

Murska Data is available for Roller mills MURSKA 2000NF Roller mill, all W-Max disc mills and for MURSKA Hammer mill.

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Roller Mills

Get ready 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. Murska's experience in crimping goes back to 1969.

The best of the best
Murska 4000

Murska 4000 is a new professional roller mill for large farms and contracting. Capacity is up to 100 tn/h with maize and up to 80 tn/h with high moisture grains. The machine uses the same reliable and high-performance technology as the other Murska roller mills in the product range. Crimped grain flows from crimping units to the discharge belt conveyor or to the plastic tube bagger.

Watch a video of roller mill in action

Murska 2000 NF

In addition to the previous 2000, the new version has several upgrades, for example:
Freewheel clutch on adjustable rollers saving energy and natural frictional flattening of grain.
Upgraded roller adjustment with 0,1–1,1 mm fine adjustment and 0–5 mm coarse adjustment.
New grain feeding unit with hydraulic motor. Improved visibility and cleaning. Faster and more ergonomic maintenance. Roller units can be pulled to the side of the machine. Shields and hatches are easy to use. LED light strips around the crimper allow you to work also in darkness.
The capacity is 50 t/h.

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. Crimping capacity is up to 30 t/h. The efficient operation of the Murska 1000 HD requires an 80-90 hp tractor.

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. The capacity is 20 t/h. Tractor power requirement is 70-80 hp.

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. The capacity is 10 t/h.

Murska 2000 S 2x2

The versatile Murska 2000 series offers sufficient capacity for even the busiest farmers and contractors.
These models feature a unique roller cassette driven by four gears, achieving a crimping capacity of up to 50 tonnes per hour. The Murska 2000 S 2×2 model is available with a standard multipurpose chassis or Max bogie trailer that can carry up to 2800 litres of additive. Accessories include an elevator, folding screw conveyor, belt conveyor, tube packing machine and automatic lubrication system.
The tractor power requirement is 130 horsepower.

Diverse range of equipment

- Trailer chassis for Murska 350-1000 roller mills
- MAX bogie trailer for M2000
- Bagger tube packing machine
- Acid bottle stand for a 200 litre barrel with hoist
- Additional hopper
- Range of rollers: 2,3 and 4 mm fluted and spot fluted

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Hammer Mill

The newest addition to the Murska product family

Murska's new hammer mill is suitable for farms that want to crimp feed grain into flour. On many cattle and pig farms, for example, the feeding recipe requires the use of dry and finely ground grain in the feed.

Hammer Mill
Murska Hammer

A unique feature of Murska accessories is that the hammer rotor can be turned quickly and easily as the hammers wear during the season. The hammer mill can be equipped, for example, with a belt conveyor or tube bagger, enabling the milled flour to be preserved in a plastic tube directly from the mill, which in turn saves energy and work.

Exact adjustment

The amount of grain can be adjusted hydraulically and completely steplessly. Standard equipment includes three sieve segments with different openings. Changing the sieves has also been made easy and flexible, as the sieve frame consists of four individual sieves, the size of which can be changed separately as needed.

Variety of accessories

The hammer mill can be equipped with tube packers of different sizes or a belt conveyor. Packing can be done using the same tractor as for other mill operations. A PTO of 1000 rpm and 200–250 kilowatts are required from the tractor.
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Cost-efficient and easy to maintain

The rotor of the hammer mill can be turned 180 degrees, which gives it a longer life and facilitates maintenance. Turning the rotor is very easy using a simple tool. The rotor has hammers that can be turned four times to get the most out of them and save costs.

Murska Data compatible

The optional Murska Data control system makes milling and crimping easy. The Murska Data control system facilitates a 7 inch touch screen, which has clear visibility in all conditions. The system has an improved Auto-drive mode, which automatically takes care of feeding the mill and dosing of preservatives based on the moisture content of the grain. When the work is complete the system sends a report including the total volume of the crimped cereal, amount of preservative added and the time spent. Murska Data also enhances the safety of the operator and the machine, as the mill alerts the user and stops the supply of grain in the event of disruption.

Accessories

- a container stand for two 1000-litre IBC containers
- pneumatic brakes
- automatic lubrication system
- preservative dispenser
- Murska Data control system
- tube bagger

Murska equipments

Tube packing machine – preserving grain in a plastic tube is a cost-effective and easy solution

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. There are available different bag sizes. 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 hydraulic chain elevator 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.

Murska models that can be equipped with a tube packing machine

- Murska W-Max 10
- Murska W-Max 20
- Murska W-Max 40
- Murska 350 S2
- Murska 700 HD
- Murska 1000 HD
- Murska 2000
- Murska 4000
- Murska Hammer

Models that can be equipped with a hydraulic chain elevator

- Murska W-Max 10
- (• Murska W-Max 20)
- (• Murska 2000)
- Murska 350 S2
- Murska 700 HD
- Murska 1000 HD

Elevator

Discharge elevator conveyor tilts manually or hydraulically. Unloading height is 3.6-5.2 m. Crimped grain flow can be adjusted in the desired direction by a remote control. (optional accessory)

Folding screw conveyor

This folding screw conveyor designed for unloading is both powerful and comfortable to use. Unloading height is 4.1 m

Belt conveyor

The belt conveyor enables the unloading of crimped grain from both sides directly to the back because the conveyor turns 180°. This is why the mill is suitable in different kinds of crimping conditions. Unloading height is 4.1 m.

Electric motor drive

An electric motor driven crimper saves energy and helps to reduce air pollution. Automatic start-up and close down. Rotation safety guard stops the mill in case the drive-belt slips or breaks.

Automatic lubrication system

Automatic lubrication system is available for all Murska crimper. The system lubricates the connected items fully automatically. The user needs only to take care of filling of the lubricant container. The system pumps the optimum amount of lubricant to each lubrication point as required.

Additive pump

VP 200 is reliable and easy to use. Capacity of the pump is 0-5 l/min.

Pro-Device additive pump

First class accuracy and usability. Dosers enclosure is made of stainless steel. Intelligent control electronic regulates flow to a certain constant level. A change in supply voltage, suction/pumping height or fluid level in the tank does not affect the total delivery.

Murska Multipurpose Chassis

Gives you a possibility to use your Murska equipment throughout the year. Crimping unit for high moisure and dry grain/maize crimping. Dumping hopper for other times: bagging whole cereals, pressed pulp, silo maize, brewery grain, chopped whole grain etc.

Dumping Hopper

Murska bagger with dumping hopper, see details above. (multipurpose chassis)

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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 manual 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. 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

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

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

Drawing bottom feeder

Drawing top feeder

Suction filler

Combined filler unit

Spirals & accessories

Pre-Crimper

Murska Pre-Crimper is designed to pre-crush horse beans, peas, corn, etc. large pulses before Murska 220SM crimper do the final secondary crimping. It can be used also as a separate unit for crimping beans, peas and corn.
Electric motor drive with integrated reduction gear transfer power to the hardened gear wheel driven fluted rollers. Pre-Crimper is comfortably quiet and almost dust free.
Pre-Crimper is controlled by the control box and a level sensor.

Pre-Crimper

Throughput Max.	3000 kg/h
Power requirement	4 kW
Shield magnets	2 x ø80 mm
Length	750 mm
Width	650 mm
Height	385 mm

Murska hall of fame – satisfied customers

"I was aware of the high drying costs of grain as grain is not often harvested dry in this area. Reliance on off-farm storage and processing was also a minus. I purchased Murska 1400 in time for 2011 harvest and ensiled 2800 tons. The crimping process suited us and it increased the profitability and performance of the cattle. So the following year we built two more purpose built crimp clamps of 750 tons each."

Fraser Scott
England

"We heard from some colleagues about their success with crimped maize in pig feeding. We started with a little part of the maize in the first year. Next year we bought a new Murska S 2000 with universal rollers. With that machine we were able to crimp maize, peas, lupin, beans and all kinds of grain. Now we have crimped with Murska for the past four seasons and we are getting more and more satisfied every year."

Jesper and Jorgen Nielsen
Denmark

"Health and well-being of the animals is the reason why my customers choose me as their contractor. Crimped maize improves animal health and increases milk production. Farmers are happy with crimping as they can feed the animals with quality maize produced at their own farm. This saves money as there are no drying or transportation costs."

Ramon Codony
Spain

"We crimp about 2 million dry tons of grain annually for our 1400 beef cattle. We have used the Murska 2000 2x2 mill already for ten years. The main benefits compared to drying are energy savings and more effective feeding. Cattle likes crimped grain fodder and it is also nice for the farmer, as there is no grain dust. The mill has been very reliable and long-lasting."

Juho Isopahkala
Suomi

"Murska technology ensures that we have fodder for the animals during winter. The advantage of this technology is the capability of earlier harvesting when the grain is yellow and the grain´s nutrient is higher."

Vasili Bytshkov
Russia

Watch more customer testimonial videos on our YouTube channel

MURSKA®

Technical specifications

Disc Mills



	WMax 10C	WMax 20C.22	WMax 40C
Capacity max	20t/h*	50t/h*	100/h*
Power requirement	60-80kW	80-120kW	Min. 240kW
Hopper volyme / auxiliary tank	380/3500l	2200/3300l	4000/2300
Elevator unloading height	4100mm	4480mm	-
Lenght bagger / elevator	5800/5330mm	7370/7000mm	7370mm B
Widht bagger / elevator	2245/2150mm	2535/2475mm	2535mm
Weight bagger / elevator	2500/2400kg	4000/3900kg	6200kg
Loading height	2910mm	3120mm	2970mm
CRIMPING UNIT			
Discs	19pc.	39pc.	78 pc.
Guard magnets	x	x	x
Protection against impurities	x	x	x
OPTIONS			
Elevator extension	1m	1m	-
Electromotor drive	-	-	-
Additive dispenser	-	x	-
Automatic lubrication system	x	x	x
Murska Data	x	x	x
Preservative dispenser	x	x	x
Discharge conveyor options	B/E	B/E/BC/FA	B/BC
Transport alternatives	M	Max	Max

B = Bagger
E = Elevator
BC = Belt conbeyor
FA =Foldable auger
M = Multipurpose Chassis
Max = Max bogie trailer
S = Standard transport chassis
NK = 3-point linkage
K = Transport Chassis

* Capacity can be lower when crimping horse bean / pea grain mixtures
** 3-point linkage
*** Max-bogie trailer

The manufacturer reserves the right to make changes.

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Roller Mills





	350 S2	700HD	1000HD	2000 / 2000 NF	4000
Capacity max	10t/h*	20t/h*	30t/h*	50t/h*	100/h*
Power requirement	15-30kW	20-50kW	30-65kW	95kW	Min. 200kW
Hopper volyme / auxiliary tank	190/1700l	300/2330l	365/3500l	1700/3400l	3300/5600l
- Max-bogie trailer				1300/3900l	
Elevator unloading height	3600mm	4100mm	4100mm	4180mm	4000mm
- Max-bogie trailer				4486mm	
Lenght bagger / elevator	5800/1460mm**	5800/2010mm**	5800/2260mm**	5900/4700mm	7400-10500mm BC
- Max-bogie trailer				7370/7000mm	
Widht bagger / elevator	2245/1250mm	2245/1380mm	2245/1380mm	2573mm	2580mm BC
- Max-bogie trailer				2535mm	
Weight bagger / elevator	1705/605kg	2480/1210kg	2620/1360kg	3620/3170kg	8500kg BC
- Max-bogie trailer				4500(E)/4800kg(BC)	5000(E)/5300kg(BC)
Loading height bagger / elevator	2850/2330mm	3070/2520mm	3070/2520mm	2900mm	3120mm
- Max-bogie trailer				3180mm	
CRIMPING UNIT					
Rollers	2pc.350mm	2pc.700mm	2pc.1000mm	4pc. 1000mm	8pc. 1000mm
Guard magnets	x	x	x	x	x
Protection against impurities	x	x	x	x	x
OPTIONS					
Elevator extension	1m	1m	1m	1m	-
Electromotor drive	15kW	30kW	45kW	-	-
Additive dispenser	-	-	-	x***	-
Automatic lubrication system	x	x	x	x	x
Murska Data	-	-	-	x	x
Preservative dispenser	x	x	x	x	x
Discharge conveyor options	B/E	B/E	B/E	B/E/BC/FA	B/BC
Transport alternatives	NK/K	NK/K	NK/K	S/Max	Modular

B = Bagger
E = Elevator
BC = Belt conbeyor
FA =Foldable auger
M = Multipurpose Chassis
Max = Max bogie trailer
S = Standard transport chassis
NK = 3-point linkage
K = Transport Chassis

* Capacity can be lower when crimping horse bean / pea grain mixtures
** 3-point linkage
*** Max-bogie trailer

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Technical specifications

Hammer Mill

	Murska Hammer
Capacity	25-45 t/h*
Power requirement	200–259 kW
Hopper volume/auxiliary tank	1700/5600 l
Hopper width	3.6 m
Length	7 m
Width	2,5 m
Weight	4500 kg
Loading height	3.2 m
ROTOR UNIT	
Rotor diameter	800 mm
Rotor width	400 mm
Rotation speed	2200–2500 rpm
Shield magnets	X
OPTIONS	
Stand for two IBC containers	X
Automatic lubrication system	X
Murska Data	X
Preservative dispenser	X
Discharge conveyor options	B/BC
Transport alternatives	Max

B = Bagger
E = Elevator
BC = Belt conbeyor
FA =Foldable auger
M = Multipurpose Chassis
Max = Max bogie trailer
S = Standard transport chassis
NK = 3-point linkage
K = Transport Chassis

* Capacity can be lower when crimping horse bean / pea grain mixtures
** 3-point linkage
*** Max-bogie trailer

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Better quality fodder – Easy storage – No extra drying costs

Manufacturer

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