AUSTRIA

C M S

COMPACT MILLING SYSTEMS
AUSTRIA

– MILLING EXPERIENCE SINCE 1881 –

ÖSTERREICHISCHES PATENTAMT

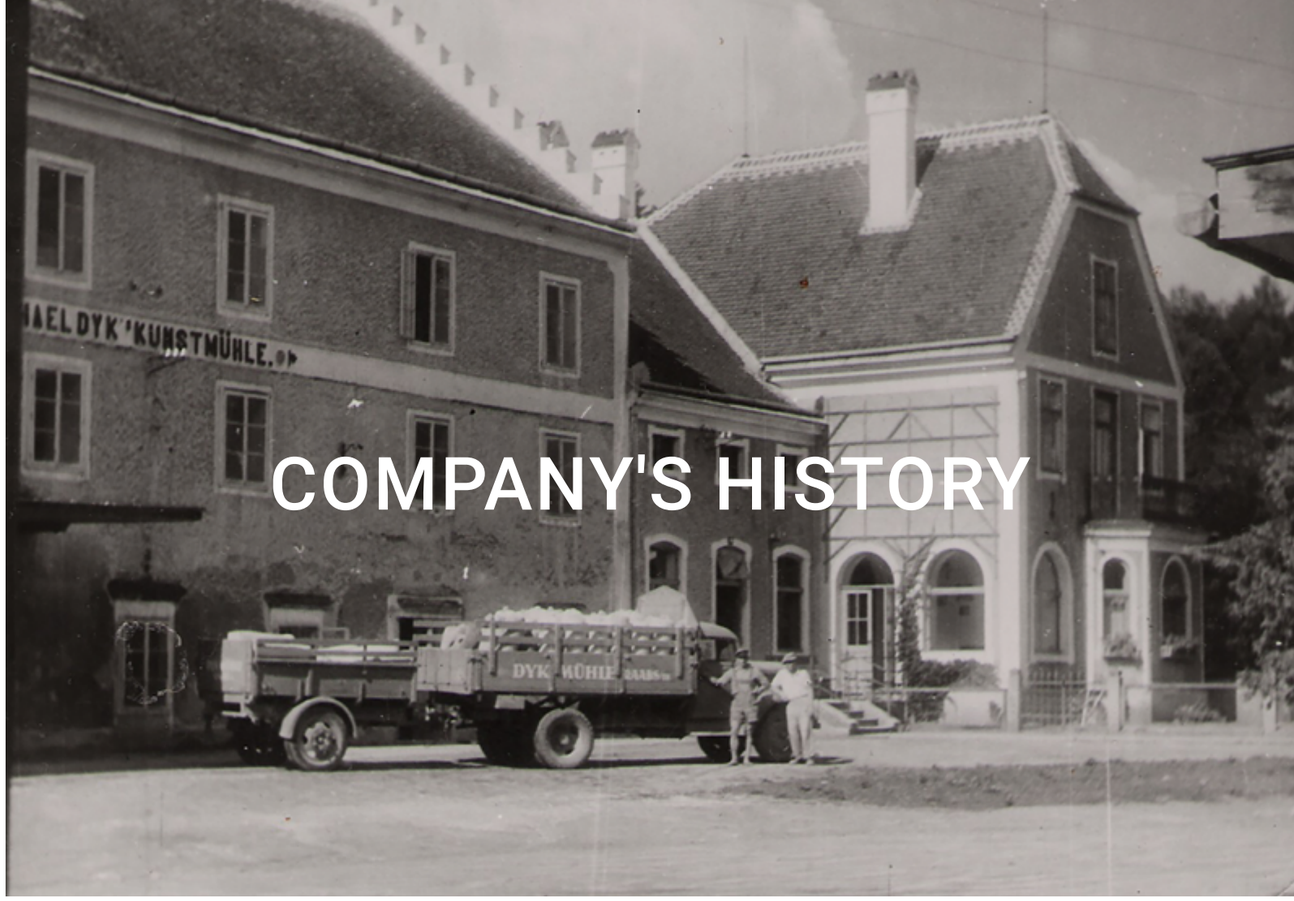
PATENT PROTECTED
SHORT MILLING PROCESS

„It is our goal to create compact milling systems, which can compete with commercial mills in terms of efficiency, yield and quality of flour. At the same time it becomes possible for our customers to decrease start-up and running costs, to simplify the operation and to be mobile and flexible.“

PETER DYK

Founder and CEO of CMS Austria

COMPANY'S HISTORY



Part of Dyk Flour Mill and CMS office in 1925

Painting of Dyk Flour Mill in 1898

Photo of Dyk Flour Mill and CMS headquarter in Raabs today

CMS has got a long history in Austria as well as around the world.

The Dyk family's milling tradition dates back to 1881, when the stationary, industrial Dyk-Mill (dyk-mill.com) in Raabs was founded. Since then it has been passed on in unbroken succession from generation to generation.

In 1970 the need for special machines and the wish to be independant has lead to CMS Austria, a sister company of the Dyk-Mill.

Due to this fundamental experience, CMS is able to deliver high quality milling solutions, because we work together closely with the Dyk-Mill and an international team, consisting of mechanics, electricians, millers, customer service and quality assurance. This close cooperation makes it possible, to merge knowledge between the Dyk-Mill and CMS, leading to significant advantages for our customers.

We are proud to be an Austrian family company, operating internationally and distributing extraordinary quality throughout world.

BENEFITS OF CMS

SIMPLE OPERATION

MODULAR, COMPACT, MOBILE

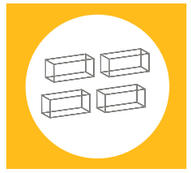
DIFFERENT GRAIN TYPES

PATENTED

A CMS Desintegrator with its special milling system makes it possible to deactivate the fat splitting enzymes in the germ bud of the grain kernels, without destroying its vitamins. Due to this method, the valuable germbud, essential for a healthy nutrition, is not beeing seperated in the CMS milling process. The shelf life of the produced flour is guaranteed for at least nine months. For our customers, this is a big competitive advantage!
This process is patented by CMS Austria only.

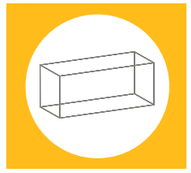
MODULAR, COMPACT & MOBILE

MODULAR



The CMS models cover a band width from 8 up to 86 tons grain processing capacity per 24 hours. Due to the CMS Modular System and depending on the requirements, the individual models can prospectively be upgraded with additional CMS units, if the market demands.
The modularity saves costs by minimizing the risks: starting small and growing with the market.

COMPACT



Using CMS plants means minimum space requirements and maximum efficiency. The compactness saves cost when it comes to transportation. Due to the lower space requirements, start-up costs will significantly be decreased, as no multi-level building is necessary.

MOBILE

The compact mills can be easily transported by truck or ship and are ideal for large scale bakery companies and bread factories, governmental rural development and food safety projects, milling sites expanding their product range as well as for agricultural cooperatives.

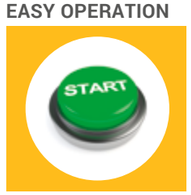
GRAIN TYPES

With CMS you can process wheat, rye, maize, sorghum and rice on one and the same plant. Further grain types are being developed by our F&E department.

TURNKEY READY

CMS mills are provided completely assembled and ready for operation, minimising your costs for installation and commissioning.
CMS mills have a standard 20' high cube container measurement, which simplifies the transport and saves start-up costs.

EASY OPERATION



Intelligent technology shall not be complicated. The operational workflow has been perfected to save personnel and maintenance costs.

PLUG IN & MILL

The simple, swift and patented short milling process ensures top quality. Our research mill ist the guarantee for our quality lead – to your advantage.
The „plug-in and mill" system ensures a 100% safe installation and will save start-up costs. Except a few add-on's, the system leaves our production site ready to use.

CMS 350

1 Cleaning and milling container

8,5t/day
Connected load*: ca. 50 kW
Water consumption: 20-25 l/h
Total weight: 8t

CMS 900

1 Cleaning container
1 Milling container

20t/day
Connected load*: ca. 100 kW
Water consumption: 50–90 l/h
Total weight: 16t

CMS 1800

1 Cleaning container
2 Milling container

40t/day
Connected load*: ca. 190 kW
Water consumption: 100-180 l/h
Total weight: 24t

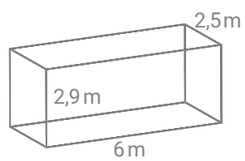
CMS 3600

2 Cleaning container
4 Milling container

80t/day
Connected load*: ca. 400 kW
Water consumption: 200-260 l/h
Total weight: 48t

The water consumption of the different CMS types above written is valid for grain with min. 12% humidity.

Every CMS unit has the dimensions of a 20 foot container.



SIMPLE OPERATION THROUGH HIGH QUALITY & TECHNOLOGY

Switch board of Siemens SPC

Years of experience, gaining know-how and steady technical innovation are packed into every CMS compact milling unit.
From A for after sales service to Z for zoning ordinances for the overall planning of future projects, CMS provides you with refined technological design.

With CMS, high technology does not lead to more complication.

While conventional mills need to be operated and maintained by highly qualified and expensive staff, CMS mills can readily be operated by anyone involved, after brief training in operating, servicing and safety.

The simple operation leads to **a minimum of personnel costs**, as no highly qualified staff is necessary and training is provided by CMS.

High Austrian quality-level and CE-labelling make CMS machines and electrical installations leading to **a minimum of maintenance costs**.

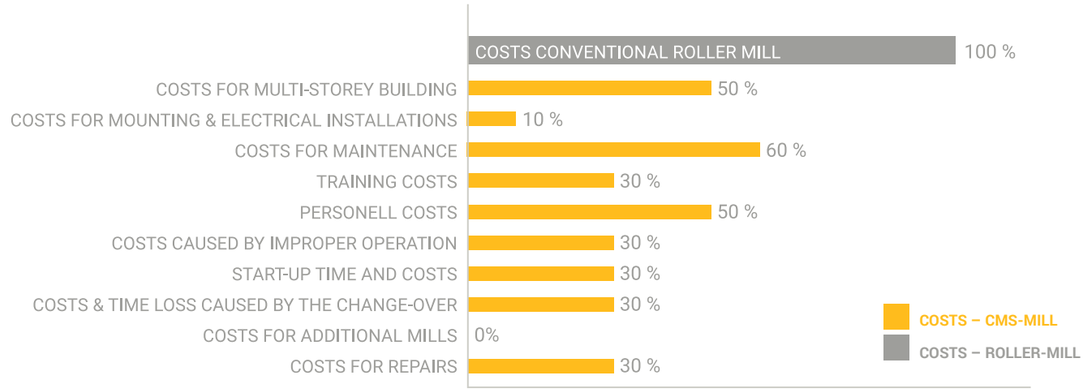
UNIVERSAL GRAIN TYPES

Various grain sorts from around the world, such as **wheat, rye, maize, rice or sorghum** can be simply processed to flour. We also work with new cereals in our research mill.
A CMS Desintegrator with its special milling system makes it possible to deactivate the fat splitting enzymes in the germ bud of the grain kernels, without destroying its vitamins. Due to this method, the valueable germbud, essential for a healthy nutrition, is not beeing seperated in the CMS milling process. The shelf life of the produced flour is guaranteed for at least nine months.

If you have **special requirements**, we can develop a perfectly custom-tailored system to make your idea of milling possible.
Costs and time loss can be avoided, due to the **easy change-over between the different cereals.**
That will **save our customers 100% on further investments** for additional milling systems.

CMS believes that our customers are looking for a long-term investment.
High quality in processing is your assurance. Worldwide.

DECREASE COSTS WITH CMS



SAVINGS ON A MULTI-STOREY BUILDING
which is necessary for a roller-mill system compared to a hall with ramp-niveau for a CMS-mill:
> COST BENEFITS OF 50 %

MOUNTING AND ELECTRICAL INSTALLATIONS
The CMS-mill is handed-over to the customer ready for operation. Therefore only very low connection-costs are incurred.
> COST BENEFITS OF 90 %

MAINTENANCE
The CMS-mill consists of easy to operate and mostly maintenance-free machines.
> COST BENEFITS OF 40 %

TRAINING
Due to the simple and straight forward technical and technological solutions a few weeks training is sufficient (as opposed to a several years schooling for the operation of a conventional roller-mill).
> COST BENEFITS OF 70 %

PERSONNEL-COSTS
There is no need for highly qualified millers. Semi-skilled employees can be trained on the job; therefore local personnel can be employed.
> COST BENEFITS OF 50 %

COSTS CAUSED BY IMPROPER OPERATION OF THE MILL
Due to the easy operation of the CMS-mill improper operation can be almost excluded.
> COST BENEFITS OF 70 %

SAVINGS ON START-UP TIME AND START-UP COSTS
The CMS-mill is test-run in Austria and handed-over to the customer ready for operation.
> COST BENEFITS OF 70 %

COSTS AND TIME LOSS CAUSED BY THE CHANGE-OVER OF THE MILL
In the case of a roller-mill system, a much more complicated change-over of the machines is necessary, when switching from wheat- to rye milling (or the other way round).
> COST BENEFITS OF 70 %

SAVINGS ON COSTS FOR ADDITIONAL MILLS
In the case of a conventional roller-mill system, different mills are necessary milling maize, millet or sorghum. The CMS-mill allows the milling of wheat, rye, barley, maize, millet etc. by one and the same machinery. Only by milling barley, sorghum and millet, an additional dry peeling machine is necessary.
> COST BENEFITS OF 100 %

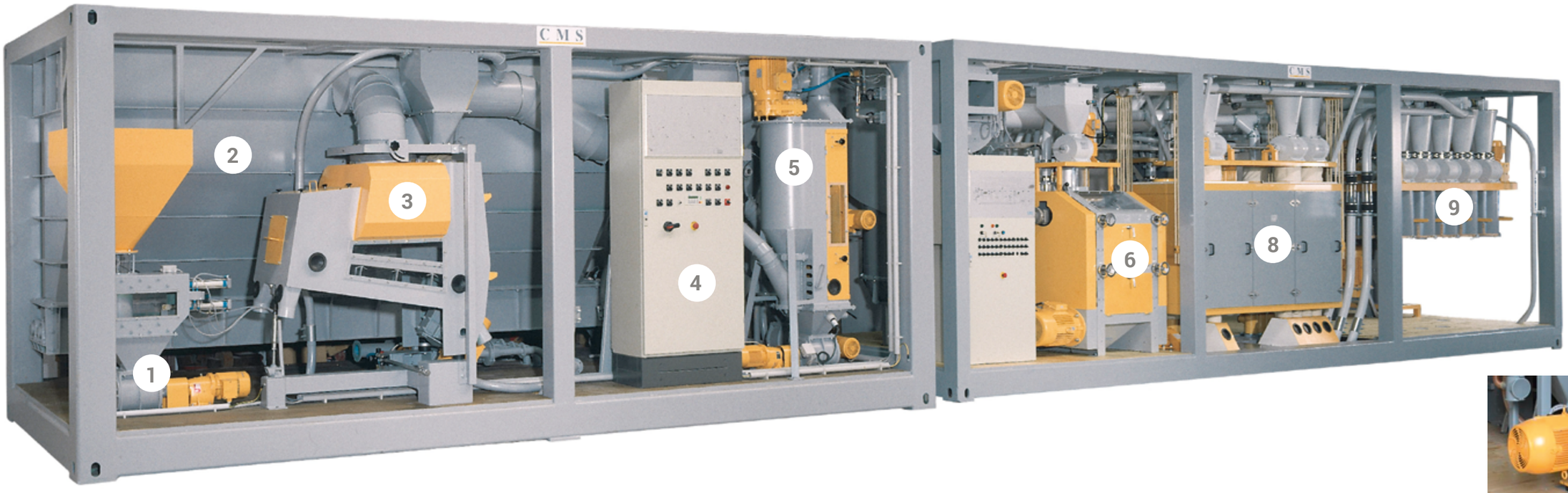
SAVINGS DUE TO THE HIGH QUALITY OF THE MACHINE-BUILDING
CMS-mill: High Austrian quality-level with CE-labelling (= less repairs).
> COST BENEFITS OF 70 %

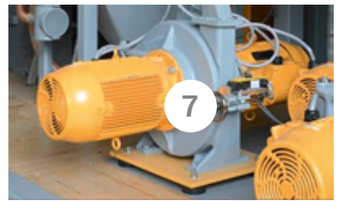
SAVINGS DUE TO THE HIGH QUALITY OF THE ELECTRICAL INSTALLATIONS, ETC.
CMS-mill: High Austrian quality-level with CE-labelling (= less maintenance and repairs).
> COST BENEFITS OF 70 %

HIGHER OUTPUT OF DOUGH EXTRACTION

The CMS-desintegrator effect a more intensive desintegration of starch, which leads to an increase of its water absorption. This leads to a higher output of dough extration compared to flour from a conventional milling system, as the starch desintegration-extent can be regulated. The main advantage for the consumer: Fresh bread for an extended time period!

PRODUCT COMPONENTS





1. Rotary seal volume dosing
Regulation of the amount of grain fed to the cleaning section

2. Tempering bin
resting of the tempered grain and preparing for the milling section

3. Combistoner
cleaning and seperating the grain from impurities

4. Electrical control cabinet
the user-friendly & reliable control center of a CMS mill

5. Wet peeler separator I of II
tempering & peeling the outside surface of the grain kernels

6. Roller mill
pre-crushing and pre-grinding the grain as preparation for the pinmill/desintegrator

7. Desintegrator
milling the endosperm particles (semolina) in one step to fine flour

8. Plansifter
sifting of semolina, flour and bran

9. Packing sockets & airlock bench
the last step in the milling process-packing the flour in bags; alternatively the flour can be blown into a silo

CMS VS. ROLLERMILL-SYSTEM

Throughout the world big mills are dominant in central areas in the production of flour from grain. These mills are working based on a conventional, very complicated multiple rollermill-system. This technology is acknowledged in industrial countries, but especially in **decentralised areas** of developing countries the **multiple rollermill-system overstrains the personal, technical and infrastructural resources.**

To meet the special needs of those countries, a short-milling-system (milling process in only 2 to 3 steps) was developed in 1982 and since then has continuously been improved. **The target, to produce high quality flour and to achieve an optimized extraction rate, is being fullfilled by the innovative CMS-milling-system!**

CMS TECHNOLOGY

- comparatively **low investments** are necessary
- also **high profitability at low capacities** can be achieved
- **no need for highly qualified personnel** for the operation of the mill is required
- the **machines** are **easy to operate** and mostly **maintenance-free**
- **different kinds of grain can be milled** by one and the same machinery

Only our company uses the patented CMS-system!

ROLLERMILL TECHNOLOGY

- very costly investments are necessary
- profitability is only possible through high capacity
- personnel must be highly qualified
- regular and high maintenance-expenses with special technical knowledge (e.g.: maintenance of fluted rollers)
- no flexibility, as the machinery is specialized on one kind of grain only (e.g.: milling of only wheat or only maize).

All our competitors use the rollermill-system!

Two essential components enable the processing of grain: a cleaning and a milling section.

The cleaning unit for the careful cleaning and damping of pre-cleaned grain and the milling unit contributes to the production of high quality baking flour with high flour extraction rates.

CMS CLEANING SECTION

THE CMS CLEANING PROCESS

Gentle wet-scouring

When cleaning wheat and rye the **valuable germbuds** (with their high content of vitamins and micronutrients) **remain** and are stabilised **in the flour** through the patented CMS-process!

THE CONVENTIONAL CLEANING PROCESS

Impact-scouring

The **valuable germbuds** are mostly peeled off and **separated** for feeding purposes or are heat-treated and added to the flour. This process decreases the nutrient value of the flour.

CMS MILLING SECTION

THE CMS MILLING PROCESS

The CMS milling-system uses a **combination of roller-milling and impact grinding.**

The first crushing step, as in conventional systems, takes place on fluted rollers **(just 1 rollermill)**. Whereas in the connected sieving on the plansifter, the milling product is sorted out into coarse bran, semolina and flour.

The further **milling takes place (in 2 patented steps only)** on desintegrators. They disintegrate the milling product through impact.
The free impact leaves the elastic elements (= coarse bran particles) complete, but friable/inflexible elements (= semolina) of the endosperm-parts of the grain kernels are **milled to flour in one step only.**

This CMS-method guarantees, that only the optimum of each crushing-procedure is applied!

THE CONVENTIONAL MILLING PROCESS

Grain is crushed by fluted rollermills through squeeze and shearing power. This kind of crushing takes place on so-called rollermills, whereby the milling of the grain is done by two parallel running rollers, which are arranged adjustable to each other and which have a fluted surface. To reach the desired fine flour quality, **20 – 25 steps (= rollermills and plansifter sections!) are needed** with this kind of system, whereby each step consists of crushing and sifting.

If you use this system (which has been developed and is useful for central big plants) on **small plants,** you tend to shorten the process. What was done correctly in 20 steps should now function in 6 steps.
The machines are overloaded, wear and tear increases and the machines mill with too high temperatures (the rollers are too hot). The flour extraction is low, but the use of energy is very high. Furthermore: the corrugation of the fluted rollers wears off much sooner and the maintenance by trained specialists on special and expensive machines is almost impossible in decentralized areas. These disadvantages result in a low profitability of the plant!

EXTRACTION RATES AND ASH VALUES

The following **extraction rates** and **ash values** can be reached with our patented short milling system, considering that the grain must have a medium degree of hardness (medium to soft quality and not a hard- or durum wheat), with a minimum hectolitre weight of approximately 80 (1 litre = 0,80kg).

ASH (DRY BASE)	EXTRACTION RATE
480 – 500	approx. 15 – 25 %
500 – 600	approx. 15 – 20 %
600 – 650	approx. 15 – 20 %
800 – 850	approx. 05 – 10 %
Depending on the hectolitre weight, the extraction rate is	**approx. 70 – 75 %**
1250 – 1600	approx. 04 – 06 %
Mix type 750 – 800	**approx. 81 %**
bran	approx. 18 %

Instead of white flour, depending on the quality of the raw material, semolina can be produced up to 25 %.

The following **extraction rates** and **ash values** can be reached with our patented short milling system, considering that the grain must have a minimum hectolitre weight of approx. 73 (1 litre = 0,73kg).

ASH (DRY BASE)	EXTRACTION RATE
500	approx. 10 – 15 %
960	approx. 60 – 65 %
2500	approx. 04 – 05 %
Depending on the hectolitre weight, the extraction rate is	**approx. 80 – 82 %**
bran	approx. 18 %

The above mentioned extraction rates are valid for CMS 900, CMS 1800 and CMS 3600.

MAIZE

SORGHUM

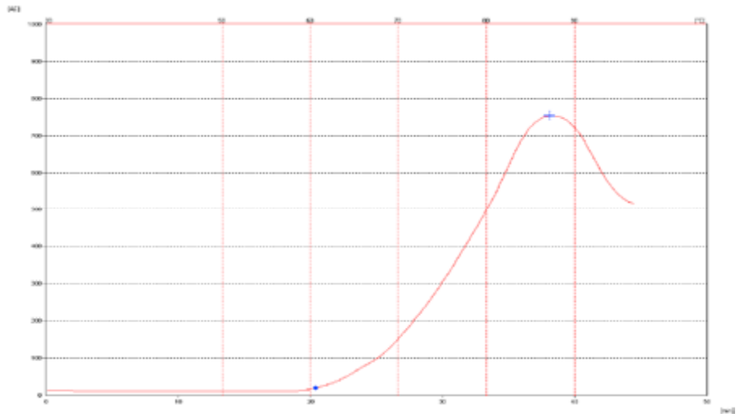
MILLET

RICE

AMYLOGRAMM

N°	Method of analysis	Result	Unit
G143	**AMYLOGRAMM (ICC 126/1) PROGRESSION**		
	Beginning of gelatinization	60.6	°C
	Temperature of gelatiniziation	87.13	°C
	Maximum of gelatiniziation	754	AE
G030	**SAMPLE MILLING SMALL**		
	Sample preparation	accomplished	
G002	**SAMPLE ADMINISTRATION DIGITAL**		

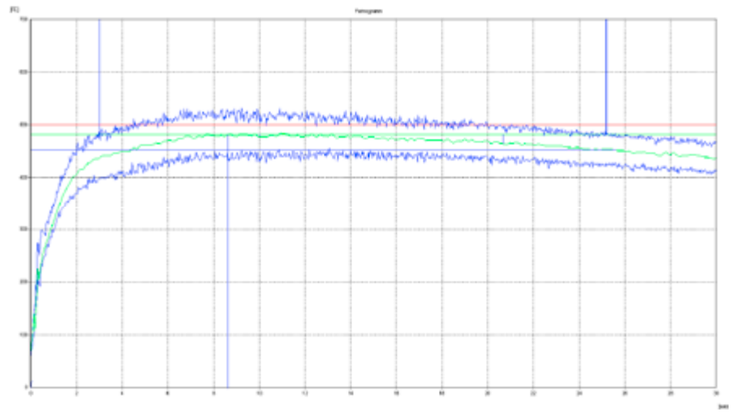
Analyses the characteristics of gelatinization (maximum and temperature) and the enzyme activity.
The higher the maximum, the lower the activity of the enzymes.
With CMS and quality grain it is easy to optimize the flour.



FARINOGRAMM

N°	Method of analysis	Result	Unit
G150	**FARINOGRAMM (ICC 115/1)**		
	Dough development	8.7	min
	Stability	22.2	min
	Water absorption (500 FE)	60.3	%
	Dough softening	18	FE
	Quality-number	256	

Analyses the water absorption, the dough development and the stability.
The longer the curve is above 500 FE, the more stabile the dough is.
With CMS and quality grain a perfect dough stability is ensured, which is of great importance to the bakeries.

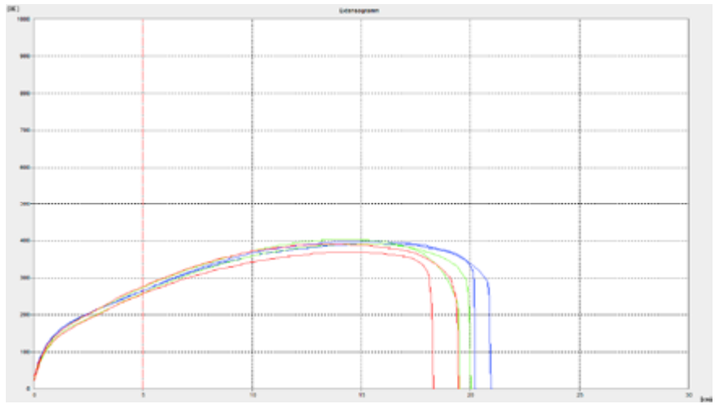


All analyses made with untreated flour (no addition of ascorbic acid)

EXTENSOGRAMM

N°	Method of analysis	Result	Unit
G151	**EXTENSOGRAMM (ICC114/1BRABENDER)**		
	Water absorption	55.2	%
	Energy at 45‘	116	cm²
	Energy at 90‘	110	cm²
	Energy at 135‘	**102**	
	Tenacity at 45‘	266	EE
	Tenacity at 90‘	267	EE
	Tenacity at 135‘	**268**	
	Extensibility at 45‘	207	mm
	Extensibility at 90‘	199	mm
	Extensibility at 135‘	**190**	
	Maximum at 135‘	380	
	Ten / exten at 45‘	1.3	
	Ten / exten at 90‘	1.3	
	Ten / exten at 135‘	**1.4**	

Analyses the extensibility of the dough.
The bigger the area of the curve, the better the quality of the flour.
With CMS and quality grain the need for additives decreases.



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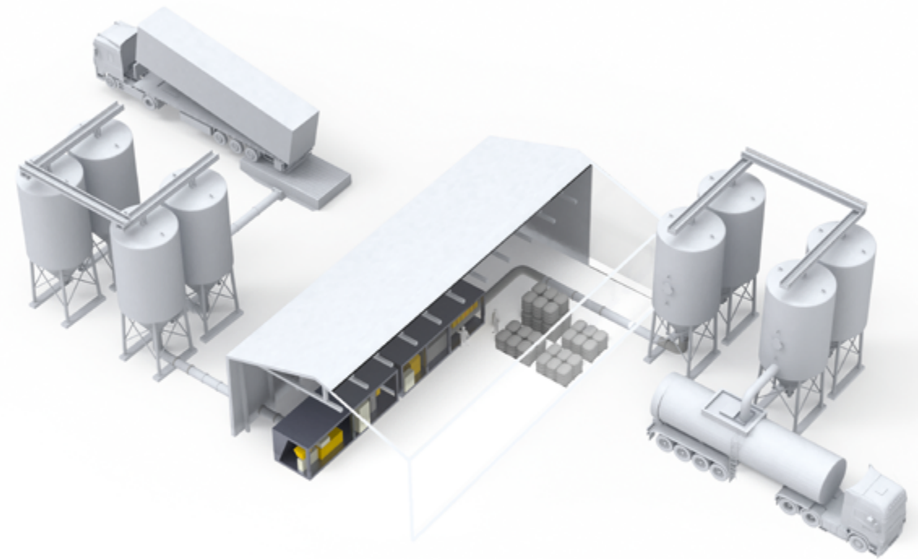


FOUR STEPS TO YOUR CMS MILL

1. CMS PROJECT PLANNING

Including capacity analysis , feasibility study, planning of periphery, workflows, etc.

2. TAYLOR MADE CMS MILL FROM AUSTRIA

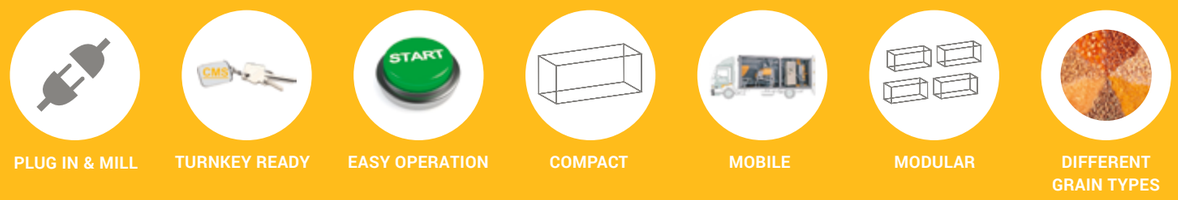
After production of the CMS plant, CMS offers a testrun in Austria with the customer and training of the customers staff.

3. TRANSPORT AND INSTALLATION AT CUSTOMERS SITE

The CMS mill will be shipped to the customers site key ready.

4. REGULAR CONTACT BETWEEN CMS AND CUSTOMER AFTER SALES

Service, help and good relation to the customer is our duty.



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