



Dear Readers,

As always, we are pleased to present you our last meur@news, allowing us to keep you informed about our technologies and new developments.

In this issue we are taking the opportunity to describe the specific features of the Meura hammermills. Since 2006, Meura has been designing and manufacturing its own hammermills. This Meura product perfectly fits the technological choices of Meura like the fine milling technology.

Moreover, we couldn't end this editorial without mentioning a bad and a good news. The bad news, known to all the brewers, is the sharp increase in malt prices over the last year. Indeed, this dramatic increase in malt prices is a general trend and is becoming more marked over the years. The good news is that thanks to Meura, you can reduce the impact of this malt price increase by recovering more extract. The Meura technologies are enabling you to recover the available extract in the best possible way as well as to use the most appropriate technologies for the use of other raw materials.

Finally, Meura recently took part in several different events. Whether it be through fairs, conferences or seminars, Meura tries to be present everywhere in the world in order to promote its state-of-the-art technologies.

You will always be one length ahead with Meura's technologies !

Michel Genart  
Managing Director

Christian De Brackeleire  
General Manager

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# The Meura Dry Milling Technologies

## ...A Fine Milling History

In 1901, Philippe Meura, looking for a technology able to work with a finer grist and to guarantee a better extract yield than was possible with a lauter tun, developed the first mash filter for the brewing industry. The yield was indeed much higher and the filter technology using a thinner bed under pressure allowed an increased rate of 8 to 10 brews a day compared to the 4 to 6 brews a day produced by the competitors. It was a revolution for the brewing world.

The success was immediate and Meura started to sell its filters all over the world. But the competitors reacted with the criticism that our filter produced a wort that was too cloudy. Meura, joined by the defenders of the mash filter technology (like the Piedboeuf Brewery in Belgium), then had to deal with this weakness. Consequently research projects were launched to produce a very bright wort while guaranteeing the best extract yield as well as the highest mash filter productivity.

By using an even finer grist and a thinner bed (4 cm), the result was not only an excellent high filtration rate but also a very bright wort. Nevertheless, with such a thin filtration cake, it was of prime importance to avoid channelling that could reduce the sparging efficiency. Quite quickly, the inflatable membrane solution for homogenizing the cake porosity became essential. The results were very exciting: 100% of extract recovery (compared to the laboratory yield) while using less water (< 2,5 l H<sub>2</sub>O/kg grist), a high production rate (14 brews/day) and a bright wort (<5 ml/l Imhoff).

In 1987, this new technology was presented for the very first time at the European Brewery Convention in Zurich and in 1989, the first **MEURA 2001** mash filter was installed in the Piedboeuf Brewery in Jupille (Belgium).

It was the very beginning of the **MEURA 2001** mash filter's adventure. Today, more than 220 **MEURA 2001** mash filters equipped with an ever improved technology have been sold all over the world.

### Grist specifications (Pfungstadt-Mebak)

	Lauter tun	MEURA 2001
Sieve 1: >1250 μ	20%	<1%
Sieve 2+3: between 1250-500 μ	50%	<9%
Sieve 4 +5: between 500-125 μ	20%	>55%
Bottom: <125 μ	10%	<35%

▲ Difference in terms of the grist specification required by a lauter tun and a **MEURA 2001** mash filter.

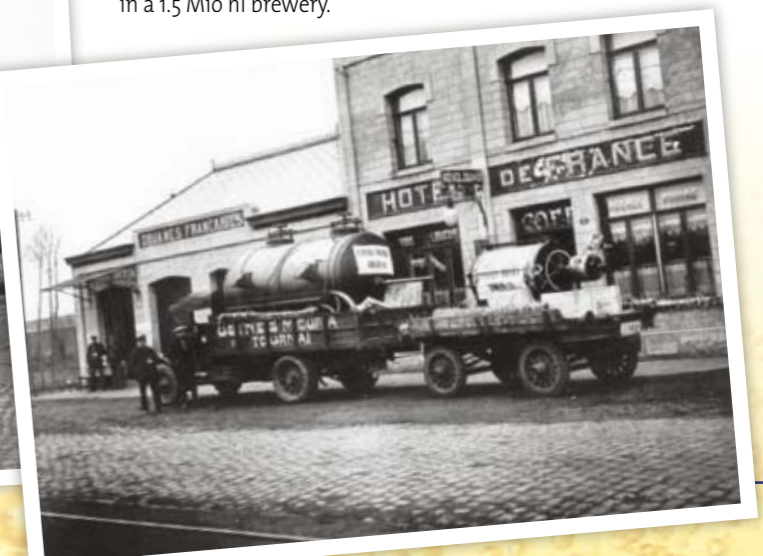
This table above shows that the **MEURA 2001** mash filter works with fine milling. In order to obtain this kind of milling, the traditional roll mills were not suitable. Meura turned then to hammermills, which already existed in the breweries for the milling of adjuncts. Meura was the first company in the world to use the hammermill industrially in order to mill barley malt. Two types of hammermill existed, one with a vertical shaft and one with a horizontal shaft. Thanks to its experience, Meura was able to select the most efficient technology, which was the hammermill with a horizontal shaft. Today, Meura offers two dry milling technologies: the **CLASSICMILL** and the **CARBOMILL**.

Although Meura has always installed and commissioned the **CLASSICMILL**, the manufacturing of this equipment was originally subcontracted. Since 2006, Meura has been designing and manufacturing its own hammermills so that its customers benefit from all the improvements resulting from its more than 20 years of experience in using hammermills to grind malt.

For the **CLASSICMILL** and the **CARBOMILL**, Meura uses the same grinding principle: a hammermill with horizontal shaft where the first impact of the grains is on the hammers and the second impact is on the breaking plates. The sieves are therefore protected against early wearing or early damage by the possible presence of stones. These are crushed before they can reach the sieves. This principle allows therefore economical savings. Indeed, with a CLM 3, the replacement of all wearing pieces - namely the hammers, the sieves and the breaking plate - costs **less than 1,500€ for 25,000 tons**, which is equivalent to a 1 year malt consumption in a 1.5 Mio hl brewery.



◀ **CLASSICMILL**  
manufactured by Meura



# CLASSICMILL

The Classicmill is an air ventilated hammermill with a horizontal shaft.

## •The CLASSICMILL description:

The CLASSICMILL consists of a hammermill equipped with hardened steel hammers fixed on a rotor, projecting the dropping malt against the breaking plates at high velocity (100m/s). As a result, malt grains are broken down into very fine particles.

A feeding rotary lock equipped with steel blades and driven by a frequency converter automatically controls the feeding of the hammermill, according to the nominal power of the motor. The mill has a symmetrically constructed milling chamber. During milling air is blown through the milling chamber in order to avoid heating of the malt grist and dust explosions. Underneath this milling chamber, a bin equipped with an automatic filter and a suction ventilator separates the air from the grist.

## Top advantages of the CLASSICMILL:

- ▶ During milling there is forced ventilation inside the milling chamber, which limits the temperature increase observed with other hammermills (vertical shaft type).
- ▶ Thanks to this ventilation, the CLASSICMILL is the ideal equipment for milling adjuncts with a moisture content up to 15% (for example barley).
- ▶ Breaking plates in the upper part of the mill protect the sieves against early wearing, reducing maintenance costs.
- ▶ A wide range of sieve mesh from 1.8 to 4 mm, suitable for malt and adjuncts.
- ▶ The hammers and sieves are easy to replace. Symmetrical construction allows the mill to run clockwise or counter-clock wise, which increases the service life of the hammers.
- ▶ Low initial cost and very low maintenance costs.
- ▶ Can be integrated easily into an existing dry goods line.
- ▶ Because the milling chamber is ventilated, there is no explosion risk in the event of a spark produced by the shock of a small stone on the hammer. Consequently a destoner is not mandatory; a simple malt siever is sufficient.



▲ Hammers and breaking plate of a CLASSICMILL

Example of a worn breaking plate showing that it is clearly protecting the sieves

Meura currently manufactures six types of CLASSICMILL, ranging from the CLM 1 to the CLM 6.

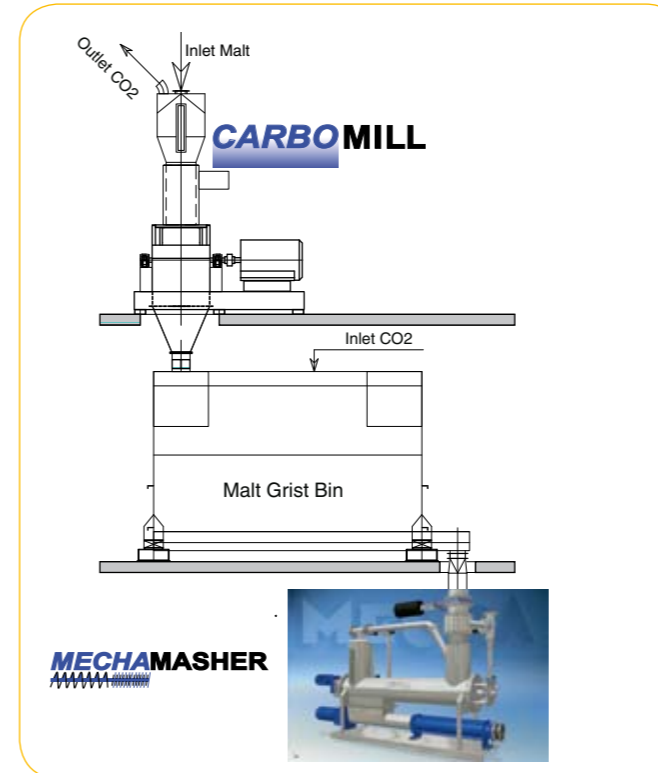
Types	Motor power (kW)	Rpm	Capacity (tons malt/hour)
CLM 1	37	3000	4
CLM 2	55	3000	7
CLM 3	75	3000	10
CLM 4	110	1500	14
CLM 5	160	1500	20
CLM 6	250	1500	30



▲ CLASSICMILL



# CARBOMILL



In order to mill finely without any risk of oxidation, Meura developed the CARBOMILL technology in the brewing industry. In association with the Meura MECHAMASHER, this technology provides a complete oxygen-free mash preparation solution for fine grist.

The CARBOMILL technology is not only a hammermill, but a new concept based on malt inlet flushing under CO<sub>2</sub>, followed by a dry fine malt milling under CO<sub>2</sub> and a subsequent grist storage under CO<sub>2</sub>.

## The CARBOMILL description:

- **Milling chamber:** The milling chamber consists of a rotor made of plates with pins to carry the hammers.
- The CARBOMILL does not use an external flow of air like the CLASSICMILL does. The inside of the rotor and the milling chamber is engineered in such a way that an internal gas flow is generated, keeping the sieves from clogging.
- **Grist storage:** This grist bin works at atmospheric pressure and under CO<sub>2</sub>, which preserves the grist from oxidation. As there is no external ventilation, the evacuation of humidity is not possible. Therefore this technology is not used for grains with a moisture content over 5%.
- **CO<sub>2</sub> injection and monitoring:** At first use, the grist bin is filled with CO<sub>2</sub>. As the grist bin is filled with grist during the milling operation, the excess CO<sub>2</sub> flows backward through the mill and is released through a vent located on top of the malt feeding bin. Thus all the oxygen brought in with the malt is stripped out by the CO<sub>2</sub> right from the feeding bin, which guarantees an oxygen-free grinding operation. In order to assure the workers' safety, CO<sub>2</sub> sensors are installed in the area around the CARBOMILL. In case of need, an alarm can then be activated if the CO<sub>2</sub> concentration in the air exceeds the permitted level.

## The top advantages of the CARBOMILL :

- ▶ Oxidation of the grist is avoided during milling and storage (no LOX activity) by CO<sub>2</sub> protection. This improves the mash filterability and the flavour stability of the beer.
- ▶ The CARBOMILL is a hammermill with a horizontal shaft. Breaking plates in the upper part of the mill protect the sieves from early wearing out.
- ▶ The mill is explosion-proof due to the working conditions under CO<sub>2</sub> atmosphere.
- ▶ The CO<sub>2</sub> consumption is very low: about 3 to 4 kg per ton of milled malt.
- ▶ The CARBOMILL has a low initial cost as well as a very low maintenance cost.
- ▶ It is possible to use other gases, such as N<sub>2</sub>.



▲ CARBOMILL

For further information, please do not hesitate to contact us:



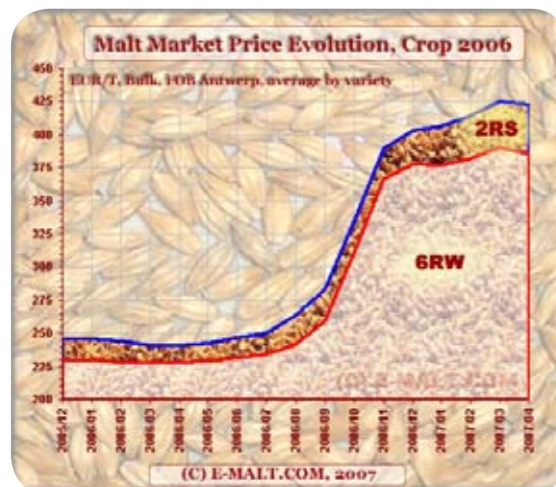
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# Damping

## the Continuous Increase in Malt Prices with the Meura Technologies



▲ Malt market price evolution from December 2005 until April 2007

### Factors influencing malt prices

#### 1 Barley price:

Barley growing requires specific conditions in terms of sunshine, humidity/water, soil composition, and so on. As a consequence, it is mostly grown in North America, Australia and Europe.

In 2006, the Australian drought cut the country's crop by two-thirds and a very dry month of June followed by heavy rains in Europe also reduced the quality and the yield of the harvest there.

Moreover, barley growing also depends on farmers' decisions, influenced by the existing support programmes established by the government. At present, in the United States and in the European Union, two of the most important barley production regions, the agricultural area reserved for malting barley has been reduced and replaced by wheat, maize or rape due to the pressure of the bio-ethanol and bio-diesel production programmes supported by the governments.

It can therefore be expected that the barley prices will stay at the current level at least for the coming years.

#### 2 The transportation costs

Many regions, like Central & Southern America, Africa and Asia, need to import barley or malt from the biggest production regions, namely Europe, Australia and Canada. As transportation becomes more and more expensive due to the increasing fuel cost, the barley malt price, significantly affected by this factor, is experiencing a parallel increase.

#### 3 The malting process cost

In order to drive the malting process, mainly water and energy are required. However, water and energy consumption are undergoing an ever increasing cost. Once again, this influences the final malt price.

All these factors influencing malt prices, together with the yearly increase of worldwide beer production, lead to the assumption that high malt prices will be maintained in the coming years.

### Continuous increase in malt prices

Last year, malt prices almost doubled. The reason for this increase was not only the poor harvest of 2006 but rather a general trend. Indeed, several different factors have an influence on malt prices, such as:

- ▶ The price of barley
- ▶ The transportation costs
- ▶ The malting process

The malt prices for 2007 delivered at the brewery may reach 450€/T. As a consequence, the extract savings in the brewhouse are of increasing importance.



### Saving malt extract

As a consequence of this continuous increase in malt prices, it is of prime importance for the brewers to achieve the maximum extract yield from the malt. The calculation below illustrates how huge the final saving of money can be with only 1% of extract saving.

#### Hypothesis:

A double **MEURA 2001** mash filter equipped with 2 X 65 chambers is installed in a brewery with a pure malt production. The double filter has a throw of 24 tons/brew and 14 brews/day are produced. With 50 weeks/year, the brewery needs 110,400 tons of malt/year. Producing 12°P beers, this brewery has an overall beer production capacity of about 6.5 million hl/year. This means that for each 1% of extract saved during the brewing process about 1,104 tons of malt are saved per year. With the annual malt price, this corresponds to about 500,000€/year for each 1% saving! Moreover, knowing that the gap in extract yield between a **MEURA 2001** mash filter and a lauter tun can reach up to 3% depending on the malt quality, the savings therefore correspond to about 1,500,000€/year for this particular hypothesis!

#### This case shows the financial significance of the extract yield in the brewing process.

Meura, leader in mash filtration technology with its **MEURA 2001** mash filter, offers each customer a filtration technology achieving the highest yield of the market. Indeed, the **MEURA 2001** mash filter,

simultaneously with other well-known advantages in terms of productivity, brightness and wort quality, guarantees the achievement of a high extract yield (at a minimum equal to laboratory yield), resulting in savings of raw material. Compared to a lauter tun, the **MEURA 2001** mash filter works with fine grist and therefore gives a higher extract of 1.5 to 3% depending on the malt modification.

In addition to the filtration step performed by the **MEURA 2001** mash filter guaranteeing a high extract yield, there is another step in the brewhouse where losses can occur, namely during the trub separation process. When this process is accomplished by a whirlpool, the recovered trub is completely oxidized and therefore should not be recycled for optimized quality reasons. This leads to extract losses of a minimum of 1.5%. To overcome these undesirable effects, Meura developed the **CLARISAVER**, a wort settling tank technology making it possible to recycle the non-oxidized hot trub recovered during the wort cooling step. The trub is then sent to the mash tun during the filtration process. When non-oxidized trub is recycled, there is no qualitative issue. Therefore, the **CLARISAVER**, coupled with the **MEURA 2001** mash filter, enables extract losses equal to zero and can thus guarantee an Overall Brewhouse Yield (OBY) of 100%.

Furthermore, as the price of the malt is continuously increasing, more and more breweries are turning to local raw materials which are cheaper, due, among other things, to the almost insignificant cost of transportation. However, the use of these local raw materials namely rice, sorghum, etc., requires adapted technologies. Once again, the **MEURA 2001** mash filter is the ideal technology. Indeed, it is less sensitive to the variation in raw material quality.

#### Conclusion:

In the coming years, we will face a lack of barley malt not only because the agricultural area used for malting barley is being reduced and replaced under pressure from the bio-ethanol and bio-diesel production programmes but also because of the yearly increase in worldwide beer production.

Under these circumstances, breweries will turn more and more, on the one hand, to adapted technologies enabling a reduction in the extract losses and, on the other hand, to other raw materials, which also involve the use of adapted technologies. Meura is mastering all these technologies and should be pleased to become your partner for damping the continuous increase in malt prices.

For further information, please do not hesitate to contact us:



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# Current News

## Brau Beviiale 2006 (Germany)



▶ From 15 to 17 November 2006, Meura took part in the renowned international fair of Nürnberg, "Brau Beviiale 2006". With a brand new stand, Meura was ideally equipped to extend its customers the best possible welcome.



▲ Many promising discussions occurred at the Meura stand

## Far Eastern Industries Ltd (China)

▶ In February 2007, Meura signed a contract with the Far Eastern Industries Ltd. (Suzhou) to produce 200hl/hour of wort at 20°P with continuous brewing, which is the equivalent of more than 2.5 Mio hl of final beer/year. This is already the second continuous brewing installation supplied by Meura.



▲ From left to right : Guy Depraetere, Meura Area Sales Manager China, Michel Genart, Meura Managing Director and Johnny Shih, Vice Chairman of Far Eastern Textile Ltd.

## IBD 2007 (Nigeria)



▶ From 26 to 28 February 2007, Meura exhibited at the IBD 2007 in Lagos. Laurent Marle, R&D Engineer, took the opportunity to hold an informative lecture on: "Yeast Pre-Oxygenation and Beer Flavour Stability: First Industrial Results".

## EBC 2007 (Italy)



▶ From 6 to 10 May 2007, Meura attended the 31<sup>st</sup> EBC Congress in Venice. Meura was pleased to welcome all the congress visitors to its booth. Moreover, during this international congress, Bruno Bonacchelli, After-Sales Services Manager, gave a lecture on "Wort Boiling – Meura's Concept with Wortstripping", a presentation that was a great success for Meura.



▲ Bruno Bonacchelli, After-Sales Services Manager, giving his lecture

All the participants have been deeply interested in the Meura presentation ▶

## Pivo 2007 ( Russia)

▶ From 24 to 27 May 2007, Meura participated in Pivo 2007 in Sochi. Alexander Tronnikov, Meura Moscow Manager, and Benjamin Mommens, Area Sales Manager, were in attendance to present Meura's technologies.

## Vietnamese Seminar – May 2007 (Vietnam)

▶ For the first time in Vietnam, Meura, jointly with the Vietnam Alcohol Beer Beverage Association, organized two seminars on Advanced Technology in High Gravity Brewing. The first seminar occurred on 22 May in Hanoi and the second one was held on 25 May in Ho Chi Minh City. During these two days, Jeroen Vandenbussche, Sales & Marketing Manager, and Claude Bauduin, Area Sales Manager, presented the Meura technologies to nearly 300 Vietnamese brewers. We would like to take this opportunity to thank all the participants for their attendance and for the interest they demonstrated.

