







# Mill E3

Unveiling of new high-tech plant is “a transformative moment in the history of flour milling”

**S**ituated in the north of England at Whitley Bridge in Yorkshire, a new milling plant is being described as a transformative moment in the history of flour milling. Built for the UK’s largest miller Whitworth Bros Ltd, the company is already reaping the benefits of the Mill E3’s technological and digital capabilities.

Touted as being one of the most high-tech mills on the market, at the heart of the Mill E3 lie more than 15,000 data points collecting information on all aspects of the production process.

The opening of the first Mill E3 is a key staging post in the journey to the SmartMill and it is the volume of data being analysed, along with the cutting-edge application of blockchain technology, that will seek to enable the most efficient, transparent, and consistent production possible – with the aim of delivering the highest quality product.

The data generated and analysed at the Whitley Bridge plant will drive the evolution of milling technology from the current data assisted mill into a plant capable of using its own process parameters in a closed loop to optimise production.

## From vision to reality

According to Roman Sonderegger, Head of Business Unit Wheat & Rye at Bühler, the Mill E3 has turned from a vision to reality. The Whitworth Bros mill is set to impact the entire milling industry by redefining future digital services.

“This is a very significant project for Bühler that allows us, for the first time, to gather so much new data on the milling process, while also giving us the opportunity to collaborate with Whitworth Bros. as we work closer towards the creation of the SmartMill,” says Mr Sonderegger.

“This is also momentous in working towards our corporate target of cutting energy, water, and food wastage by 50 percent in our customer value chains by 2025.”

The opening of the Mill E3 is the culmination of nearly two decades of close cooperation between Bühler and Whitworth Bros. “Bühler is excellent at building flour mills and we are pretty good at running them,” explains Mike Peters, Managing Director of Whitworth Bros.

“We can feedback observations in real time conditions in which we are dealing with client expectations and production pressures. Running and maintaining a mill is very different from building one.”

### MILL E3 – EFFICIENCY THREE LEVELS

Bühler’s Mill E3 is a new and efficient way of engineering, installing and operating a mill. It meets today’s challenges of rising infrastructure costs and stricter labor regulations by being installed faster and more compact. Substantial energy savings help save costs and the environment.

- 10% energy savings**  
Compact mill design, 100% shaft covered TDR and integrated grinding system Amus create energy savings of up to 10%.
- 30% faster installation**  
Amus and pre-assembled and tested modules enable a quick 3-to-5 day installation.
- 30% less building investment**  
Novel engineering, modular equipment and Amus require up to 45% less building volume.

**ENERGY**  
**TIME**  
**SPACE**  
**EFFICIENCY & QUALITY**







the 15,000 data points are the optimum machine parameters required to ensure the continued manufacturing of high-quality products using digital technologies. Once that is defined accurately you can then be more exact in the way you set up your mill process and further push your process capabilities.”

Other service modules used in the Mill E3 include: Temperature and Vibration Management Service (TVM), Yield Management System (YMS), Error and Downtime Analysis (EDA), Overall Equipment Effectiveness (OEE) and Replay.

Together these provide continual data feeds on machine and process trends, potential maintenance issues and how machine performance relates to quality and efficiency.

“The SmartMill services are like having a lot of Lego bricks available and you, as a miller, pick whatever you need to deliver against your needs and your targets,” explains Mr Sonderegger.

“What is most exciting about this journey is that we are only at the beginning and all the data we are gathering will allow us to come up with new ideas and with new services to optimise and help our clients around the world.”

### A safer & more transparent value chain

Another key feature of the Mill E3 is the development of a seamless interface from laboratory systems to Bühler Mercury MES and Bühler Insights and then on to Whitworth clients through blockchain in the future.

What Bühler has done at the Whitworth’s plant is to connect the laboratory to its Mercury plant control system (MES). With this system the whole plant can be controlled and managed, allowing the operators to know exactly which job is running at which time and which product is needed when an order to deliver a new flour product to one of its customers.

This system also connects other features such as traceability, warehousing and stock management. This system brings all of these together, joining the laboratory with all of the already existing mill features and functions.

This means that the quality information is always there when it is really needed, so for example we know the exact amount of intermediate product in a certain silo, at which state they are in with respect to certain quality parameters.

The system also allows us to know exactly when to take the samples and also adding the online tags to it, so adding a



Top Left: (from left to right) Andrew Thomson, Technical Miller for Whitworth Bros Ltd, Mike Peters, Managing Director of Whitworth Bros Ltd, and Roman Sonderegger, Head of Business Unit Wheat & Rye, Bühler Group

combination of offline and online analysis to it, so we know how and where to adjust the process so that the machines etc. The aim being that in the end of the process we always reach for a very high and a constant level of quality.

This is something that Bühler has implemented at the Whitworth’s plant and also two or three other plants, with the aim of getting closer to the Smart Mill. This is why the company takes the information from the laboratory and all of the information that is available on the MES and it transfers this information to Bühler insights, to the IoT Platform, with these data points some of the 15,000 previously mentioned data points that we get every five seconds.

The MES System is compatible with well-known systems like those manufactured by Pertem, Brabender, etc. But if there is already a laboratory information system in place, that is already gathering the information then Bühler can directly connect to such a system, affording extra flexibility during the setup stage.

In terms of the long-term analysis the information is stored there and is available for a very long time because we don’t need to buy a computer service it is just available in The Cloud and it does not cost much.

What Bühler is exclusively doing here, it is kind of a prototype now, is a new technology called Bühler blockchain. Currently in development, the blockchain application will enable the secure transfer of data to clients, providing transparency around the exact process parameters being used in the milling of their product.

The vision is that blockchain will reduce the need for such frequent sampling and laboratory testing as clients access production parameters in real time as part of the product certification process.

The key advantage of blockchain is secure data collection and storage allowing for highest data security and transparency. In the end, it will enable a consistent, retraceable and food safe product.

“We are currently working with Bühler to ensure that all the data we are observing on the blockchain system aligns with our laboratory data before we go live with blockchain with our clients in the future,” explains Mr Thomson.

Blockchain has yet undiscovered potential. Future application of blockchain could include using sensors in vehicles to monitor time taken, ambient temperature and other safety processes.

It could be used to monitor equipment performance as a form of smart insurance or to improve traceability.

#### Benefits of traceability & quality management

Less manual work	Digitise transactions that today are paper based and done by humans
No errors	Due to the automatic data transfer and automatic attachment to an incoming product or during the process, the information is not missed.
More consistent quality	Lab data is available where it is really needed in the process. This ensures a higher level of quality management, ensuring the customer gets what they ask for.
Increased traceability	All relevant information is available in Mercury MES and if needed in Bühler insights. Sharing information is much easier.

