



**CASE STUDY**

## Time machine

If you need further convincing of Christy Turner's 'built to last' reputation, then the company's recent restoration of one of its original E R & F Turner Flaking Mills is an impressive testament to the longevity of their machines

**M**anufactured in 1937, the vintage 18 inch flaking mill - the equivalent of an E R & F Turner 460 today - is now back in situ at South Down Feeds in Northern Ireland following a five-week restoration. What is more amazing, a large part of the restoration work on the animal feed mill was cosmetic, with around 90 percent of the original machine still intact following the extensive work which involved stripping the machine back to the last nut and bolt.

"The restoration of our 1937 flaking mill is a great testament to the longevity of our machines," according to Managing Director Chris Jones, who added that, "It is amazing to see how this machine has stood the test of time, while knowing the lifespan of our modern mills will only get better. Today's machines - with their modern materials, technology, robust cast and sound construction - are even better equipped to withstand the high forces and vibration inherent in the flaking process."

### Building upon manufacturing skills and expertise since 1837

A consolidation of highly respected British brands E R & F Turner, Christy & Norris and Miracle Mills, Christy Turner Ltd is renowned for quality British engineering and innovation in the milling industry.

Building upon manufacturing skills and expertise since E R & F Turner started production in 1837, while making the most of modern technological advances, Christy Turner continue to produce machines of choice for manufacturers around the globe.

E R & F Turner's flaking mills are possibly the most famous

export of the Christy Turner brand family. Over 90 percent of the machines used by UK cereal giant Weetabix at Burton Latimer & Corby sites are E R & F Turner mills - many already offering up decades of service.

Arriving at Christy Turner's Ipswich workshop in 2015, the vintage machine, which weighs around 4.5 tonnes was lifted off the truck via an overhead crane ready for its makeover. It was met by an excited, but apprehensive engineering team.

As Ian Butcher, Christy Turner's Production and Service Manager who led the project, explained: "The biggest obstacle we faced was not having engineers familiar with these particular models and the innate historical knowledge of a 1930s engineer. As a result the rebuild involved a bit of research and we relied heavily on the Christy Turner archives, searching through microfiche to locate mechanical sketches relating to the exact model. While some of the fundamental principles were similar, many improvements have been added to our machines over the years, making them mechanically very different."

Ian added: "What struck me at first was that the machine was in remarkable condition for its age and it really just needed smartening up. Towards the latter part of its production life, which spanned some 80 years, a few small parts had started to fall off the mill, so the owners were keen to see it thoroughly restored and set it up for many more decades of service."

"It is a great advert for the construction of these original models that a restoration was actually a viable option for a business, almost 80 years on."

### Stripping the machine and restoring it, one area at a time

Engineers tasked with the restoration work set about stripping the machine back to its basic components restoring one area at a time.

Impressively, almost all the core components were fully

restorable and in working order. The only large components which required replacing were two gears and a phosphor bronze bush. Other than that the work was mostly new pins, bushes, nuts, bolts, welding and painting.

The chassis itself only required painting and welding to reinforce the frame. While it looks similar to E R & F Turner's equivalent 460 model, Christy Turner's modern base castings are actually even more substantial, making them stronger than the 1937 model.

The rolls still had life in them, so the engineers simply reground and re-fluted them to the customer's specifications.

Ian explained: "Due to the nature of the milling process it is common for rolls to wear unevenly, resulting in a poor flake quality, so we restored these rolls to ensure they were parallel. Regrinding and re-fluting is a core part of our servicing business. The fluting on a roll acts like a saw tooth, so as the flake comes in it grabs it and pulls it through the rolls. The condition of the rolls greatly affects the efficiency of a machine."

A key difference between the vintage mill and the modern



460 is E R & F Turner's latest mills have rolls that spin on a roller bearing, whereas the older machines relied on four Phosphor Bronze Bearing Bushes fitted to the shaft. Out of the four bushes on the vintage model, only one was so badly worn that it needed replacing, the other three were easily restored. A lot of the original guards and castings were also easy to restore, however the logo cover was replaced.

The only other parts which needed fully replacing during the restoration were the drive gears that link the rolls together. These were badly worn. The original drive gears

were from a casting, which was no longer available, so Christy Turner commissioned custom-made solid steel replicas from a specialist gear manufacturer.

Ian said: “The basic principles of the model are similar and you can see it looks similar in shape and design, but there are some significant differences when you compare it against our modern machines. For instance, the linkage between the two rolls now operates via a more hygienic belt driven system, whereas the old model is driven by gears. This is why these gears needed to be custom-made, as they are no longer part of the modern machine.

“Also the spring loader scraper adjustment is very different today. The scraper system controls the metal blade which fits against the roll, with the scraper peeling off the crushed flakes so they drop into the hopper. On the 1937 model this is a spring loaded system whereas today our machines include a pneumatic scraper system which applies constant pressure.

This is one part of the machine that looks very different today. Similarly, the spring pressure assembly, which allows for movement when grain goes through the rolls, was modified in the 1970s. This element was restored to its former state, but we could not replace it with the new version.

“We could not retro fit anything new on this model and the project was very much a rebuild with a view to making sure all the parts fitted well to modern standards. We didn’t actually want to alter the machine’s fundamental principles though, and neither did the owner, as it is such an impressive historic artefact. Our extensive work did, however, result in improvements to the strength, hygiene and safety of the machine and set it up for many more years of service.”

### **E R & F Turner’s historic, and continued, contribution to the world’s milling landscape**

The stunning vintage model, which was featured in E R & F Turner’s centenary catalogue, is now on standby as a back-up mill at Southdown Feeds and remains a steadfast example of E R & F Turner’s historic, and continued, contribution to the world’s milling landscape.

As well as supplying new and reconditioned machines, Christy Turner has a busy spares and service department, delivering everything from machine maintenance advice, on-site servicing and replacement wear parts such as beaters, screens, rotor parts, bearings and bearing housings.

Chris said: “We are always happy to take on a challenge and the restoration of the 1930s mill certainly tested our engineers, but it was a very inspiring project and well worth the meticulous research.

“We take quality of service very seriously, priding ourselves on our comprehensive test and development facilities and support and parts provision. While our products are renowned for their reliability and longevity, we nonetheless stock a broad range of spare parts in our large warehousing facility.”

In 2012, Christy Turner, celebrated 175 years of supplying high quality robust and reliable Flaking Mills, Hammer Mills, Pulverizers, and associated plant for the human foods, animal feed, biomass, waste recycling, minerals, chemicals and pharmaceuticals industries around the world.

Combining years of experience with innovative ideas, the latest design tools and sound engineering, Christy Turner still manufacture its machines on site in Ipswich, where E R & F Turner began its historic journey in 1837.