



## BALAGUER ROLLS 100 years of engineering that today supports affordable and high-quality milled foodstuffs

by Roger Gilbert, Milling and Grain

**T**urning swords to ploughshares, a biblical quotation from Isaiah 2:3–4, took on a new meaning when I visited the popular tourists summer destination of Alicante in mid-June to help celebrate a milestone for an international company called Balaguer Rolls.

Here, in one of the most hedonistic places on the planet, there is a company ‘turning steel into foodstuffs – the modern equivalent of that now famous biblical phrase.

Balaguer Rolls produces some 16,000 rolls annually for the flour, vegetable oil, chocolate and cereal industry globally – that’s 70 per day – ranging from 150mm to 812mm, based on rolls diameters. Without these precision-made rolls it is doubtful that our food industry could produce the food products of the quality we have come to expect and at a price that is affordable.

Located in the hills that surround Alicante, the village of Onil, which looks down on Castalla and some 40km north of the coast, this company which employs just 160 staff, celebrated it’s 100 year anniversary in June. It has a global reputation as a most committed and advanced manufacturer of it’s type in the world. 99 percent of its production is exported to more than 130 countries.

Rolls are manufactured from base metals including imported pig iron, scrap metals and a selection of specialist metals including titanium, chromium, manganese, cobalt, nickel but to name a few.

### Factory visit

Approximately 200 visitors attended the tour of the company’s manufacturing units in Onil. Following a short welcome and video introduction, the visitors were divided into some 10

separate groups to tour the manufacturing plant.

Milling and Grain was one of two magazines allowed dispensation to take photographs inside the factory and was escorted around the factory by foundry manager Patricia Pla.

After viewing the incoming metal bins, in flat storage and big bags in the raw materials wearhouse, we passed through the laboratory where all incoming metals are tested with the latest scanning and probing equipment before entering the foundry itself. Metal samples of completed rolls are also kept for a period of 10 years for quality control purposes.

This company runs some five induction furnaces which feed into their respective centrifugal machines that spins the molten metal into the shape of the roll layering metal down in



Antonio Juan Navas, quality control manager, carries out the ultrasonic testing



Visitors gather at the company's welcome area before tours of the three factory sites begin



Tolerance testing over the full length of a roll must be within five microns

the required order to achieve an outer casting of 15-40mm of hardened steel supported on a strong steel base. Rolls are determined by their internal measurements and this company produces rolls from 150mm to 812mm diameters.

The furnaces operating on our visit were the 2500kW units preparing 4000kg of molten metal each. The completed 'moulds' are coated with silica so that they do not stick to other metals and rolled outdoors to cool from their casting temperature of 1550 deg C.

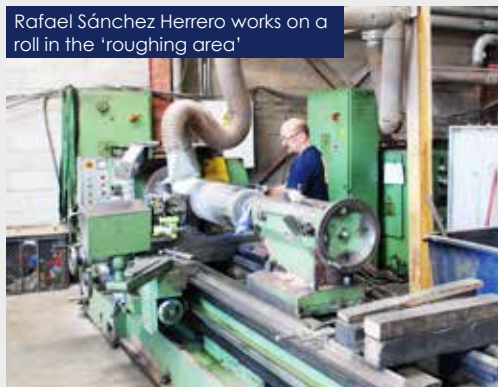
The tour covered the 'roughing area' and the 'pre-machining areas' and then the 'boring area', all processes in preparing the basic roll for balancing and shaft fitting. At this point all rolls are ultrasonically tested to ensure there is no cracking and to



Roel Doornebosch from Rodomach Welding Solutions from the Netherlands with Gerardus Te Riele



Patricia Pla, the foundry manager at Balaguer explains the layering of metals then ensure that the outer 15-40mm of steel is of the highest quality in terms of strength and wearability



Rafael Sánchez Herrero works on a roll in the 'roughing area'



Juan Ramon Frances tests the fluting on a roll to ensure it is within the tolerances specified with the company's purpose built flute testing unit. This handy brief-case size unit carries a three dimension camera that has a lens in its base to read the roll's fluting

check the structure for any defects and to ensure the boundary between the two metals making up the rolls are fully integrated. Some of the larger rolls weight up to 20 tonnes and will spin up to 1000rpm so it's vital that any imperfections are located in the manufacturing process.

"It's not common that a roll is rejected. Once a roll is approved it receives a serial number, not before," says Antonio Juan Navas, quality control manager who carries out the ultrasonic testing.

There are also areas for sandblasting for surface and cleaning of rolls using aluminum oxide and other materials and a workshop in a separate building for shafts and any bought-in components that, by the way, are tested to the same high standards as the components made at the Balaguer factory.

**Latest technologies in use**

The latest development at Balaguer Rolls is the third factory building which houses the high-precision rolls grinding area, the fluting area and where the optical flute testing is carried out. The building interior is kept at between 21-22 deg C year round.

A new piece of hand-operated testing equipment incorporating the latest technology, can determine if rolls, especially those for chocolate, biscuits, breakfast cereals manufacture, are within five micron maximum tolerance set by the industry over the length of the roll. This ensure manufacturers can achieve a precise grind that meets product specifications.

In the fluting area were several Ocrim fluting machines. Each roll takes anywhere between four to six hours to complete this stage of the process. It is here that a significant development in

roll production is taking place with the addition of the first large-scale Rodomach fluting machine that has its own automated tool grinding unit so the 12 tools fitted to the machine can be changed and re-sharpened automatically. This helps the unit flut rolls up to three times faster completing jobs of bigger rolls in just two hours.

When asked what made the machine so fast, the general manager of Rodomach Welding Solutions Roel Doornebosh from The Netherlands, who was on hand to explain the operation, said the fluting tool was able to start slowly and then increase its speed along the roll before reducing speed at the end and then returning quickly to start the process again. He explained that this configuration was effectively quicker that attempting to cut two flutes at a time and also saved on energy.

**At the heart of the milling process**

The foundry site works a two-shift system with 24 people on each shift. Because of the climate, shifts run from 22:00 through to 14:00 each day. As demand increases the company is prepared to introduce a third shift from 14:00-22:00.

This was a memorable, three-hour visit to a manufacturer that produces engineered components that perform to the highest standards at the very heart of our milling industry.

Companies such as Balaguer Rolls – which we were invited to help celebrate their 100th anniversary - and others producing these and other unique components for our industry, form critical parts of the milling process and are just as important as the multitude of farmers who grow the cereals and cocoa that pass between them. ☺