

# Plug&Grind®: the new solution in small and medium-sized modular and portable grinding stations

By Moisés Rodríguez Nunez

Cemengal, with more than 25 years of experience in building grinding stations, decided to develop a small grinding station to fulfill the requirements of an existing segment of the market that was overlooked by most of the suppliers. This market was looking at works with less than 0.25 million metric tons of cement per year.

Cemengal started developing a small grinding station, but in this case tried to do it differently. That is the reason the company came up with the idea of placing the grinding station into containers and modules to make it both portable and modular. Being the first to develop this concept, Cemengal has patented it worldwide.

## The product

The Plug&Grind® Original was launched to the market two years ago (2012) at a conference in Africa. From there, Cemengal has participated in the most important conferences and conventions all over the world and has given more than 20 presentations to cement producers and companies related to the cement industry to explain its advantages.

Already 14 Plug&Grind® stations have been sold in seven countries on three continents.

Today, the company proudly introduces the new Plug&Grind®XL, of which two units have already been sold. This new XL follows the same concept, and here too Cemengal is paying close attention to the smallest details. The capacity of the new product is 30tph compared with the 12tph of the Original. This enables the machine to reach a production output of nearly 0.25 million MT of cement per year. And this quantity of cement is being produced from small modules, all preassembled in Spain.

Cemengal has always worked with the best European suppliers and with the new Plug&Grind®, nothing has changed. The best machines and components are used to satisfy the client and avoid any difficulties – especially in isolated places where nothing is easy, and fixing a machine could pose a substantial problem.

## The Order

As soon as an order for a Plug&Grind® is received, Cemengal's Civil Engineering Department starts to prepare a Civil Engineering Study. This is supplied to the client well in advance of installation to enable them to have the land ready before the Plug&Grind® arrives on site. Extensive experience in the field helps Cemengal to provide the best layout configuration for the available surface. At the same time, the Procurement Department begins purchasing the components for the machines that have longer manufacturing lead times. The containers are specifically manufactured and homologated for Cemengal to their specifications and delivered very speedily to their workshop outside Madrid.

## The pre-assembly

The order of the containers' assembly has been carefully studied, taking account of both the delivery time of the equipment and resources required for its installation. Also the experience acquired after 14 units have been sold, helps the company improve the process and reduce the lead time.

When the containers arrive in the workshop, the mechanical works commence. Once this is finished, the containers go to the electrical fitters, and the electrical components of the



Plug&Grind® are installed. It should be pointed out that in this stage, the mill drive frequency drive is assembled together with the rest of the electrical works and the control room. The three local cabinets enable an easy and fast connection between containers. The "plug concept" is always borne in mind.

When the mechanical and electrical works are complete, cladding is placed and the containers are prepared for transportation by road and sea. The advantages of having homologated containers with standard measurements are manifested in savings on time and cost of transport.

In parallel, elements that should be set up on site, such as ladders, platforms, handrails, transfer chutes, belts, liners, balls and ducts that connect the equipment between containers, are packed. Everything is labeled in order to allow the client to start the P&G® erection on site himself, thereby reducing the expenses associated with having a Cemengal supervisor on site.

## The transport

As soon as everything is prepared in the workshop located close to Madrid, containers are moved to the port and made ready for their dispatch. The port will be chosen from the various options that are available in Spain and depend on the final destination of the Plug&Grind®. Nevertheless, an average of one month could be considered as a correct estimation for LATAM and Sub-Saharan Africa.

## The erection

The erection of the Plug & Grind® on site takes a month. When containers are levelled and fixed to the concrete slab, mechanical technicians start to join the containers to each other, the mill internals are mounted and platforms and ladders are installed. This work is done by the client's workforce, supervised by Cemengal engineers.

The Cemengal supervisors must, at this stage, also face one of the most important and relevant activities: the alignment between the mill and its special planetary gearbox which is responsible for reducing the mill speed to the rpm needed for the correct distribution of the grinding media inside the mill.

The electrical cabinets and the mill, fan and separator motors, are wired to the electrical room while the Plug&Grind® is connected to the main electrical network of the global plant and all the signals are tested. If the network is not available, the client always has the possibility of connecting the Plug & Grind® to a diesel generator.

After the mechanical and electrical assembly comes to an end, this stage concludes with cold tests and verification of the correct

performance of all the equipment when the start and stop sequences of the Plug&Grind® are checked by the automation technician from the control room.

## The first cement

During the next couple of weeks, the mill is filled with the grinding media and P&G® starts to work in order to advance to the most highly anticipated moment – its first cement. Once the plant is under control, Cemengal prepares the guarantee test, where the Plug&Grind® should be working for 24 hours and producing cement of the quality and quantity agreed to in the contract.

At this moment, and only few months after the beginning of the project, the Plug&Grind® is totally commissioned and ready to yield enormous profits, as it is doing in various countries for a number of clients.

Today clients from three continents are closer to their end consumers with a low-risk investment and working with the world's best quality.

## The future

The first steps for the Plug&Grind® has been taken, but this is only the start of a long journey as 2015 will herald the launch of a new line of Plug&Grind® equipment. Watch this space! ■

## Our Clients

Cemengal is proud to have all types of clients for the Plug&Grind® system.

**Cement Producers:** Mombasa Cement, Cementos Intercoceánico and Lafarge

**Concrete Producers:** Saudi Readymix Concrete Ltd.

**Others:** We have also clients coming from various businesses related to, or not connected with, the cement industry.

**More information from Moisés Rodríguez Nunez,**  
email: [moises.nunez@cemengal.com](mailto:moises.nunez@cemengal.com)  
[www.cemengal.com](http://www.cemengal.com)