

Automatic wet batching for quality concrete

Ready-mix wet batch plants – with capacities ranging from 30 m³ to over 240 m³ per hour – are a more cost-effective alternative to the traditional dry ‘Karoo’ batch plants that currently dominate the local market.

Pan Mixers South Africa (PMSA) is the largest supplier of concrete brick, block and paving making machinery in Africa. To maintain its competitive edge, the company recently entered into a local partnership with Italian-based construction machinery manufacturer, IMER. The partnership will see PMSA stock and distribute IMER wet batch plants to industries across Southern Africa.

Globally, wet batch mixing plants are the standard for ready-mix and site batching. PMSA marketing and sales manager Quintin Booysen indicates there is a noticeable shift towards this trend in southern Africa, where high-strength and high-quality concrete is required in minimal time.

“There is a definitive trend among plant owners looking to move towards wet batching. PMSA and IMER have identified this as a major growth sector and, as a result, we recently received two orders for IMER wet batch plants to showcase to existing and potential clients,” he explains.

The IMER wet batch plants from PMSA are fitted with either a planetary or twin-shaft mixer, depending on the capacity of the plant. Booysen points out that the aggregate is batched automati-

cally from bulk aggregate storage bins onto a weighing conveyor belt.

“The weighed aggregate is fed into the mixer where cement and water are automatically added. The concrete is then mixed by the forced action of mixing paddles and arms before being discharged fully mixed into the transit truck or even directly into a pump, as may be required in the case of on-site batching. The plants have an average 90-second cycle time between mixes,” he adds.

In dry batch plants, aggregate is loaded into a weighing hopper by front-end loaders until the correct weight is reached. The aggregate is then sent via a conveyor belt to the transit truck. Cement and water are then added and the constituents are then ‘free-fall’ mixed in a cement mixing truck.

Once sufficient time has passed with the drum rotating at high speed, an appointed ‘batch-man’ located on an inspection platform typically inspects the consistency of the concrete in the truck and, if required, adds more water before giving approval for the truck to leave the yard.

An experienced ‘batch-man’ is required to estimate when the concrete is homogenous. When the truck arrives on-site, the foreman may request several

more minutes of high-speed, high-rev mixing before the concrete is discharged.

Wet batch plants create fully mixed concrete, which ultimately reduces costs, as it eliminates the need for high-speed mixing in the truck prior to dispatch. “It also reduces wear and tear on the fleet of trucks, which is the ready-mix plant’s highest capital expense,” Booysen continues.

What’s more, there is also no need for manually checking the truck before dispatch, as the mix is completely homogenous by the time it is discharged into the cement truck.

Proven performance of wet batch plants

When comparing the quality of concrete produced in dry versus wet batch plants, research conducted by the Italian Institute for Concrete found that wet mix plants produce concrete of an undoubtedly higher quality than a dry process.

Various reasons were cited, including: lower permeability of the concrete produced; repeatability, which reduces the standard deviation; and a reduction in errors made by inexperienced or inattentive personnel.

The research also found that, when using the same water/cement ratio, concrete produced in a wet batch plant had higher workability. This ultimately results in a reduction of the water/cement ratio for higher strength concrete, that is, compared to the dry mix process, less concrete is needed for a same strength concrete or the same amount of concrete produces a higher strength concrete.

Finally, the research showed that the mixing effect of wet concrete mixers facilitates total cement hydration, as confirmed by mix designs with a higher strength class that use the same quantity of cement. Given these findings, Booysen is confident that PMSA and IMER can achieve measurable growth in sub-Saharan Africa through industry-specific wet batching plants.

“IMER is an internationally-recognised wet batching plant manufacturer, and bearing in mind PMSA’s standing throughout Africa, I am confident that this partnership will bring considerable value to our local target market, which in turn will lead to sustainable growth long into the future,” he concludes. □



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