

# Zest WEG's expanding E-House manufacturing capability

MechChem Africa visits Zest WEG's E-House manufacturing facility in Heidelberg, South Africa, and talks to PPC Manager, Ruvern Moodley, and Facility Supervisor, Arno Broodryk about the expansion of their capability.



To expand capacity and meet growing demand across Africa, Zest WEG has steadily invested in its manufacturing facilities in South Africa. "We have made a lot of improvements in Heidelberg, first by concreting the open-land working area for constructing our E-Houses and then by expanding our under-roof area to enable us to continue working in wet weather," Ruvern Moodley tells MechChem Africa while touring Zest WEG's E-House manufacturing facility in Heidelberg.

"We started with a 1 100 m<sup>2</sup> concrete floor, which we covered with a shed roof to a height of 19 m. We then installed a full drainage system on the site, which takes any rainwater into underground sumps for pumping away into municipal drains. Thereafter, we concreted and roofed another 900 m<sup>2</sup> of floor area and a further 650 to 700 m<sup>2</sup> has since been concreted, though the roof has not yet been added," he continues.

Sitting on the concrete, mostly under roof, Moodley points out the largest E-House unit ever built in South Africa, a three-roomed 45 m portable mini-substation with a 6x6 m cross sectional area. "On the left is a 13x6 m motor control centre (MCC) with low-voltage variable speed drives (VSDs) for controlling all the pumps,

conveyors, and other motor-driven equipment. The central 16x6 m space is split into three: for the computer network server; the controllers (PLCs) that manage communication, monitoring and control; and the medium voltage (MV) switchgear for the feeders and incomers," he says, adding that the third 16x6 room will house the cooling plant for the E-House, which is destined for the hot environment of an iron ore mine in Northern Cape.

Across the site, dozens of E-Houses and containerised mini-substations, along with skid-based transformer platforms are under construction. "High-cube (2.89 m high) shipping containers come in 12 or 6 m lengths. If possible, we buy existing containers and modify them into mini-substations. But where larger or non-standard sizes are required, as in this case, we build an E-House from scratch, putting in the cladding, the floor plates, the air conditioning, power and lighting, fire detection, and everything normally needed in a brick built sub-station.

"We then populate the units with all the electrical switchgear and plant control equipment specified by the client – and while most of the switchgear and VSDs are supplied from the Zest WEG range, we can accommodate specific client preferences

from other brands," notes Moodley.

In principle, he adds, the idea is to deliver to site a fully functional, self-contained, and tested electrical substation, either as an E-Container or as an E-House, mostly containing Zest WEG manufactured LV and MV switchgear, MCCs and VSDs.

Critical to the success of containerised or housed substation solutions are adequate cooling, safety, and fire protection, all of which are routinely accommodated in Zest WEG's solutions. "For cooling on our MV VSDs, such as the WEG MVW 3000, for example, there is no need for access to the back of the panels for the chilled air, so they can be housed against one wall in single-width containers. But the MTW MV switchgear range needs front and rear access, so we put these into a double container with access at the front and back, or in single container with a removable plate at the back so the panel can be accessed from the outside," he says.

When it comes to fire safety, Arno Broodryk explains that a special fire-resistant insulation is included on the 45 m unit for the Northern Cape mine. "This is cement based, but it is mixed with a product called Pratliperl to produce a lightweight plaster-type fill that is an excellent thermal insulator

with exceptional fire resistance."

"If a fire starts and the fire suppression system fails to put it out, the wall insulation will contain the fire for up to two hours, preventing it from spreading into the other units and into the plant itself," he explains, adding that, "the insulation also stops the structural steel from softening, which prevents the walls from collapsing."

Moving to the transformer skids, Broodryk notes that the transformers themselves are delivered "over the fence" by WEG Transformers Africa (WTA). Customised transformer systems are typically mounted on skids connected to spring-loaded air circuit breakers (ACBs) and fitted with a containment fence, before being tested and shipped to remote sites. "The two twin transformer systems we are currently completing are for switching the high voltage to medium voltage and then from medium voltage to low voltage. These will be placed somewhere safe, connected to the incomers and off-takers and there they will remain, delivering power to the plant. These skids also incorporate a containment tank in the base to catch any oil that leaks from the transformer," he tells MechChem Africa.

"One of the unique selling points of our containerised solutions and E-Houses is that the whole substation, and the transformer to power it, can be manufactured and factory

acceptance tested before being delivered to site. This massively reduces the installation requirements, risks and costs," says Moodley.

"As soon as the unit has been placed and the input and output cables connected, the system can immediately deliver power to the site. "We now have the local capability

and capacity to design, manufacture, test and deliver customised E-House and containerised substation solutions – equipped with Zest WEG switchgear – to power plant equipment of almost any size in South Africa or anywhere in Africa," concludes Ruvern Moodley.

[www.zestweg.com](http://www.zestweg.com)



A three-roomed 45 m portable mini-substation with a 6x6 m cross sectional area destined for the hot environment of an iron ore mine in Northern Cape.



A skid-based transformer platform under construction at Zest WEG's E-House manufacturing facility in Heidelberg, South Africa.