

Safe, affordable housing with personal, social and economic benefits

Tiaan Mynhardt of One World Living Systems (OWLS) and its sister company Polytherm has spent over a decade refining his affordable, durable, energy efficient housing and building systems, which maximise the benefits of utilising reinforced, expanded polystyrene (EPS) panels.

His background as an engineer ensures that he has a hand in conceptualising, designing and testing the systems himself.

“I had sold my previous business and was looking for a new challenge, so I spent two years travelling the world, looking at what can be achieved with the best alternative building systems. I managed to identify those that were truly economically viable and capable of competing with brick and mortar. These systems inspired the concrete reinforced insulated system (CRIS) wire panel system that OWLS uses today,” explains Mynhardt.

Concrete reinforced insulated (CRIS) panel type systems have been used all over the world to construct durable and efficient housing and commercial structures. CRIS panels are especially well suited for construction in the high wind and earthquake prone regions of the world. The panels are extremely strong and have been designed to withstand hurricane force winds in excess of 300 kilometres per hour.

“After perfecting the technology and refining it for South African conditions, I went on a road show across the country, visiting universities and industry associations, where it was extremely well received. However, still no one bought into the concept. There is still a perception in South Africa that there are no real challengers to bricks and mortar, especially among architects, who don’t expose themselves to alternative building technologies,” he adds.

“This is unfortunate because, in fact, bricks and mortar are slow, unproductive and often costly!”

And then, in 2006 South Africa’s electricity crisis struck. Suddenly there was a surge in interest in energy-saving building systems. The impressive thermal values and insulating properties of polystyrene came to the fore and people turned to the Expanded Polystyrene Association of South Africa (EPSASA) looking for viable, alternative building systems.

In the years that followed Mynhardt rolled out the OWLS system across South Africa, Botswana, and Mauritius. The roll-out was an enormous success and as people grasped the total savings – direct (labour, maintenance) and indirect (time, creeping interest rates), that can be realised when building with EPS; they started to adapt to it and accept it.

The financial benefit to the contractor or developer building with EPS panels is a direct saving of approximately 30% on total costs.



An AP panel is an engineered steel wire mesh assembly system of the most advanced technology in reinforced concrete. This combination of a three dimensional structural wire panel, stucco and polystyrene core have made possible these prefabricated panels of exceptional durability and strength, at a fraction of the weight of cement blocks or brick masonry.

Advantages of building systems using AP panels:

- Affordable – 30% total construction cost reduction
- Durable – Fire, hurricane and earthquake resistant, long lasting and strong
- Energy efficient – Greatly reduced cooling/heating costs
- Environmentally friendly – No wood products, no CFCs
- Easily constructed – Lightweight building material
- Pest/termite/rodent resistant – Resistant to rot and mould
- Labour efficient – Small crew
- Mass produced to exacting tolerances
- Aesthetically pleasing – Very flexible design can be used for anything from simple to complex structures

EPS thermal insulation products are lightweight and have stable, long-term thermal resistance. They are cost-effective when compared to other rigid board insulations on the basis of R-value. EPS is considered water resistant and vapour permeable. It's an inert, non-biodegradable organic plastic foam that will not rot and is highly resistant to mildew.

There is a worldwide shortage of affordable, durable housing and the problem is rapidly becoming worse. The CRIS panel system can be quickly and affordably implemented to meet the need for long lasting homes, commercial buildings, and many other types of structures.

EPS is classified as environment friendly because it does not depend on natural resources and is totally recyclable. No skilled labour is required to erect a house from these panels and they can be transported with a bakkie and trailer. They are versatile, compatible and light weight.

“These systems are highly adaptable, any architectural design or engineering application is possible. The only limitation is the imagination of the architect. The panels allow for fast and easy construction. Using insulating concrete forms results in a faster and more efficient building cycle,” adds Mynhardt.

“We found that the EPS used in our system provides extremely good acoustical properties as well, which makes it a sound choice for high density housing such as townhouses. We've used the system to build houses, boundary walls, suspension floors and roofs, pillars, and swimming pools.”

A demonstration house in Port Elizabeth, from foundation to roof, was built in five days. Work on the house began on 20 December and the family was able to celebrate Christmas in their new home.

Proposed images and captions



Uptake in Mauritius has been particularly good, despite its location in a hurricane zone, Mauritians realise the strength of the system and have embraced its benefits wholeheartedly. The interlocking EPS panels, set in mesh, can be clearly seen in this image. Plastering has begun on outside of the room on the right.



A swimming pool being constructed from the EPS panels.



Minister of Human Settlements Tokyo Sekwale asks Tiaan Mynhardt about his alternative building system.



A larger house built using the AP panel system.