

By Glennis Kriel

The builder of the future

Moladi founder Hennie Botes has developed a way to build houses and social infrastructure faster and cheaper, without jeopardising the structural integrity of buildings.



Workers fill the plastic formwork cast with a mixture of sand, cement and a chemical premix.

While most other industries have undergone tremendous change, the building and construction sector has seen little new technological breakthroughs over the past 50 years. That was until **Hennie Botes, the founder of Moladi**, came along.

Realising the struggles of the poor in getting good quality housing, already in the 1980s, Botes decided to do something about it. His solution was the development of a whole new building system, which he named Moladi. The system replaces the cumbersome bricklaying process with an approach similar to plastic injection moulding.

A "mould" is produced by training local unskilled labourers to assemble reusable plastic injection moulded panels, commonly known as formwork. The formwork is erected on an engineer-designed raft foundation. Doors, windows, electrical and water reticulation are mounted in the appropriate positions onto the formwork. Thereafter, the formwork is filled with a quick-setting aerated mortar, consisting of sand, cement and an admixture.

The house is left to set overnight and the formwork is removed the following day and re-erected on the next foundation. The superstructure is finished by fixing conventional roof, plumbing fixtures, ceiling, hanging



One of the houses built in Ghana.



The first house built with the Moladi system in 1987.

doors, glazing and painting.

Botes has built thousands of houses all around the world – from Mexico to Sri Lanka – with the system. One of his greatest recent breaks was the construction of a 1 600m² courthouse, funded by the World Bank in Tanzania, which the World Economic Forum (WEF) in March named as one of six buildings to revolutionise the construction industry.

According to the WEF, the Kibaha District Courthouse was built for half the money it would have cost when using conventional methods at about \$250/m². The building was completed in six months, whereas it would have taken three years with traditional methods.

What did you do before you started Moladi?

I am a toolmaker by trade and completed my apprenticeship with the South African Railways. Toolmaking entails the making of steel moulds to create plastic components. Napoleon Hill's book, *Think and Grow Rich*, made a huge impression on me, especially the suggestion that you should "solve a problem and sell the solution".

When my wife fell pregnant with our first child, we heard a lot of people complaining about how difficult it was to bath babies, having to carry bathwater to and fro. To solve the problem, I developed and patented a

Q&A:



Hennie Botes, founder of Moladi, is passionate about the development of affordable housing.

plastic baby bath that fitted across the bathtub. The design was sold all over the world, resulting in 20 000 sales per month over five years. The invention gave me the freedom and finances to start Moladi.

Why did you start Moladi?

Back in the 1980s in the townships I already saw how poor craftsmanship resulted in most of our less fortunate citizens living in inferior housing structures. I wanted to fix this problem. My toolmaking background then gave me a great idea. Instead of having people lay and cement bricks to build a house, which is very difficult if you don't have the know-how and skill, I decided to develop a plastic mould system and cast structures – which is filled with a sand and cement mortar – to make houses more affordable, reduce the impact of human error and accelerate the building process.

The moulds can be assembled in different configurations, so you can build anything from a small 40m² one-roomed house to a double-storied four-bedroomed house or even big structures like schools.

How does your business plan work?

Making money is important, but has never been the main drive of the business. I believe that when you follow your passion and deliver a quality product, money will usually follow you.

My idea with the business was to help solve housing problems in SA, while generating new employment opportunities. So I supply training in the construction of Moladi houses and licence people who finish the course to build Moladi houses.

Training is free, but trainees need to pay for the moulds and admixture. Our licensees are supplied with viable business plans to help them secure loans for their start-ups. I have a vested interest in the success of the licensees, since poor outcome reflects badly on my business.

I prefer working with cooperatives rather than individuals, as it means that people will check up on each other. This is especially important when it comes to cash flow. Many new entrepreneurs fail because they splurge on want-to-haves, such as bakkies and new

cellphones, instead of the must-haves required to make a business grow.

How do you minimise risks of your licensees?

First, there is no incentive to take shortcuts by skimping on building materials, as it is relatively cheap to build these houses and therefore the margins are bigger than with conventional construction. It differs from conventional construction, where people often steal building material like bricks or blocks off-site or simply reduce the cement content in the mortar or plaster mixes when the cash runs out.

Second, since river sand is used from the local quarry nearest the building site, the licensees are required to send us a sample of the river sand for analysis. Based on the sieve grading result, we will advise them on whether they would have to add more coarse aggregate or fines. The sand is mixed with cement and an admixture, which we specify based on the analysis, to create the mortar. The admixture creates air bubbles in the mortar, which helps to enhance the flow ability and thermal properties of the wall. Cube samples are also taken of the mortar during casts to ensure the mix complies with our standards.

How does the price of constructing your houses compare with that of traditional houses?

It is difficult to say, since there is such a great variation in the quotes and final results in the traditional building industry. A while ago, I saw quotes ranging from R8.5m to R34m for the construction of 640 houses in Paterson. Would 640 cars vary so much from dealership to dealership?

All builders and contractors have one common denominator – the building material supplier. The only way they can compete and make profit is through managing the labour, work flow and the quality of work. Failure to manage the process will result in a loss of profit. The loss would be even greater if rework is required. The business model is based on the ability of the skilled artisan to deliver.

Yet, how does one measure the production ability of individuals throughout the week?

The bottom line with Moladi is that the building material used costs less because river sand forms the bulk of the content. Eliminating “waiting time” also saves a lot of money, not only in labour cost, but also in holding cost. With Moladi, the first houses can be finished within a week and due to the benefit of the production process brought about, one per day thereafter. There is also less room for error, since there are fewer variables that need to be planned for and considered.

Not counting innovation, what would you say is one of the biggest strengths of your company?

We are a small team, which means that our overhead structure allows us to function profitably in the low cost mass market. **Companies with high overheads simply cannot compete in this small-margin big-volume space. The real market requires a vast amount of homes below the R500 000 range** and this is the market that we as Moladi focus on.

I did most of the work alone for many years after I started the company. These days my two daughters, Shevaughn and Camalynne, are key to the successful running of Moladi and they fulfil vital roles. We outsource work to keep overheads down and have very good relationships with various suppliers, building experts, engineers, town planners, architects, funding institutions and so forth. We pride ourselves that we are equipped to take land to stand to home to key as a “one-stop shop”.

What has been some of your greatest achievements?

We have won numerous awards over the years, and were also selected by the Smithsonian Institute in 2011 to showcase Moladi at the United Nations’ “Design for the other 90%” exhibition in New York.

However, what really makes me tick is to see how our licensees succeed in their businesses. It was a great joy to see how the devoted team we trained to work on the Tanzania project also trained others in their community, primarily women. As such Moladi brought hope and helped others to break out of the poverty cycle.

What have been your greatest challenges?

People are hesitant to try out new things, especially when it comes to something as personal and dear as investing in a home. Many people also think that Moladi uses alternative building materials. To me Moladi should rather be categorised as a superior building technology (SBT) and not as an Alternative Building Technology (ABT) because it is a totally new, superior way of building – an improvement on what we have been doing over the past thousand years.

What has elevated Moladi as a technology was not the lowering of cost to produce, but the social

acceptance factor. The client wants to live in a Moladi home, as it looks and feels the same as a traditionally built home.

Moladi produces houses that are approved and enrolled by National Home Builders Registration Council (NHBC) and certified by the Board of Agrément South Africa, and banks are willing to finance Moladi homes. Longevity and resaleability are two key criteria used by the financial institutions as yardstick. This we have demonstrated and proven with our first home built in 1987.

How many houses have you built since you started Moladi?

We have only built 300 in South Africa, due to terrible bottlenecks and government bureaucracy. This is bound to change due to rising pressure caused by the shortage of houses and there not being enough skilled artisans to help address this shortage.

Most of our projects have been implemented overseas, in more than 21 countries. We have for example built 800 houses in Mexico and are currently in negotiations for large projects in Cameroon, Ivory Coast, Zambia, Ghana, Nigeria, Mauritius and Namibia.

What are your plans for the short to medium term?

We are currently in negotiations with the NHBC to establish Moladi training colleges in all the provinces in the country. Moladi is a tool to solving two major issues: high unemployment, and a housing backlog of 2.3m subsidy homes. We hope that Moladi would help to pull things together by training our people to build houses for themselves.

What are your long-term plans?

There are a few goals we have set ourselves. First, we aim to establish Moladi as the “Henry Ford” of mass housing. This we intend achieving by producing as many components and products to help reduce cost of “producing” homes on a production-line basis, from production to homeowner, bypassing the middleman in the supply chain.

Second, we are looking into funding models that could assist home ownership. And third, look at rental stock as a means to house those that purely want to rent. The aim of this product would be to replace shacks and informal settlements.

The regulatory requirement enforced on financial institutions make it very difficult for the ordinary man in the street to qualify for a mortgage and it is this market that needs a different financing option in order to own a home. The automotive industry is a good example of the many different ways of purchasing a car. Maybe the time has come to adapt the home ownership criteria to accommodate the many people that rent, purely because they do not fulfil the current stringent lending conditions. ■

editorial@finweek.co.za



A classroom built in Gauteng.

Moladi is a tool to solving two major issues: high unemployment, and a housing backlog of

2.3m
subsidy homes.



Formwork can be fitted together to form different-sized houses.