



Efficient Sanitation System to Combat the Global (Rural) Sanitation Crisis

Member company Categories

Columbus Stainless
original concept for production of or application of stainless steels; strong environmental improvement potential; preservation of scarce resources; life-cycle costs lowest compared to competing materials

The Challenge

The global sanitation crisis is addressing the need for an ecologically sound and hygienic solution.

Adequate, hygienic sanitation systems are not equally available for the developing and rural parts of South Africa. This is exaggerated by the scarcity of access to running waters in these regions.

Why?

Developed urban areas use traditional water closet toilet systems. In rural or remote areas that do not have sufficient access to potable or running water, pit latrine sanitation systems remain the dominant alternative. There are dangers associated with the pit latrine systems. These include:

- Groundwater and river pollution if the system is not designed to treat the by-products correctly.
- Poor disposal systems of liquid faecal sludge results in hygienic concerns due to build-up of hazardous waste and harmful bacteria.

- The pit system does not operate on a permanent basis, so when the existing units are full they are covered with soil, requiring new units to be erected. Available space becomes a constraint.

Betram's Amalooloo product range addresses these underlying issues, supplying a safe, dignified and hygienic sanitation system.

Needed Action

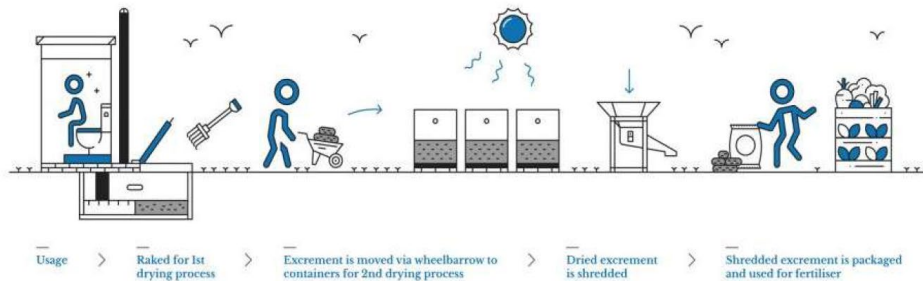
Betram Pty (Ltd) has developed and patented a unique sanitation system for both Waterborne and Dry (Ventilated Improved Pit) structures, called the Amalooloo. The Amalooloo is an affordable, sustainable system, offering a holistic sanitation loop which includes the safe management, collection, storage, treatment and disposal of human waste. The Amalooloo sanitation systems do not require running water systems in order to function and is only dependant on natural environmental conditions.

How the system works:

Amalooloo sanitation technology makes use of a complete dry composting system, by preventing the creation of faecal sludge – one of the leading causes of sanitation related diseases and deaths. The liquid waste, comprising of the hand washing water and urine, is separated from the solid organic waste by means of a separator and diverted into the soil via an irrigation outlet. The resultant nutrient rich soil becomes the ideal location to plant a vegetable garden for the community.

The solid organic waste material collects in a specialised bottom substructure, where it undergoes primary and secondary drying processes. These drying processes are unique to Amalooloo's state of the art ventilation system, which ensures a fresh supply of air enhancing the drying process whilst guaranteeing an odour and fly free sanitation system. This is facilitated by UV resistant

ventilation outlets (located in the exterior of the units) which are heated by the sun, creating a vacuum within the ventilation system. This vacuum causes the warm stale air to move up and out of the substructure, replacing it with cooler fresh air. Once the solid organic waste has been dried, it is removed from the substructure to be recycled into organic, safe and nutrient rich fertilizer.



Picture courtesy of Betram Pty (Ltd)

Each unit comes equipped with a small water tank and basin for the washing of hands, ensuring personal hygiene. When you wash your hands, the water used is collected in a separate cistern beneath the basin. This water is then reused to clean the pedestal, similar to traditional flushing mechanisms. This dual functioning water system ensures the preservation of water, which remains a scarce resource in most developing and rural areas.

Components:

Sanitation systems in isolated or rural areas in South Africa are usually constructed as outdoor structures. These structures are subjected to the elements, including consistent sun exposure and moisture. The materials chosen must therefore be durable and able to withstand these harsh environments; without the need for additional maintenance and repair.



Picture courtesy of Betram Pty (Ltd)

For the Amalooloo sanitation system, the external structure is constructed out of precast reinforced concrete and the toilet system (seats, reservoirs and flushing mechanisms) are a durable plastic. All components are bolted together using stainless steel (304) fasteners and anti-theft bolts to ensure the structure is steady and sturdy.



Hand over of Amalooloo school sanitation solution with learners
Picture courtesy of Betram Pty (Ltd)

The doors, door frame and metal trims are made from 3CR12. This assists to keep the product durable, not only due to its strength and corrosion resistance, but also rigidity to house the critical locking mechanisms that will not degrading over time, ensuring privacy and safety for the users.

Traditional pit latrine toilet systems use mild steel as the material of choice. Over time, the structures corrode and degrade when exposed to the elements. This requires regular refurbishments and or full replacement. Looking at the comparison with stainless steel, 3CR12 becomes the most competitive life cycle cost material of choice, without the need for additional maintenance and replacement of the product. This is the additional advantage for the Amalooloo sanitation system with offered longer product lifespan.

The Amalooloo Sanitation system is safe to use and easy to maintain. Transportation and assembly is done easily with the units being supplied in easy to assemble kit form. On-site construction of the units for large projects, like

sanitation systems in schools, takes between 5 to 10 days. Local community members are trained for the construction and installation of the sanitation systems, in doing so creating sustainable jobs and encouraging product ownership by these communities.

The benefits of the Amalooloo system:

- Addresses the socio-economic right for every person to have immediate access to an adequate, functional and dignified sanitation solution without sacrificing quality.
- Eco-friendly solution: Preserves natural resources, which is especially vital in water scarce regions.
- Empower communities: Provides an additional and sustainable income stream from the natural organic fertilizer by-product.

Additional sources:

How does the Amalooloo system work:

<https://www.youtube.com/watch?v=pJ4rza7-utY>

The Amalooloo App:

<https://www.youtube.com/watch?v=K80vmBkCOq0>

Amalooloo School Sanitation Launch:

<https://www.youtube.com/watch?v=UlqX85-tS4w>

Action Review

Specific; Create a fully sustainable and affordable sanitation technology. The aim of the organization is to also bring about awareness not only of sanitation related topics but also overall health.

Measurable; Number of units per year; including Health Awareness Campaigns.

Achievable; Yes - ongoing commercial success.

Realistic; Yes; Supplied in excess of 30,000 structures since product's inception.

Time-bound; Ongoing.

Horizontal Expansion Capability

Yes. The 3CR12 steel component (thickness) used in the Amalooloo system can be replicated for similar developmental applications, for example in roofing systems. Because of its affordable price and overall longevity, 3CR12 has become the cost effective material of choice for most sustainability projects in South Africa. The applications are endless.

Outcome

Business efficiency: Creating a sustainable product stream for reclaimed thicker gauge cold rolled 3CR12 to a usable prime product. Thinner sections in 3CR12 are still a developing and growing market stream based on the continued success of this and other related application. This results in increases yield optimisation; whilst reducing inventory levels.



School girl washing hands inside the Amalooloo toilet
Picture courtesy of Betram Pty (Ltd)