

Save water, go stainless

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Globally, as much as 35% of all treated water is lost to leaking piping systems, with South African levels reaching as high as 60%. IMIESA talks to John Tarboton, executive director of the Southern Africa Stainless Steel Development Association (Sassda), about the role stainless steel has to play in addressing South Africa's water challenges.

How is Sassda exploring the role of stainless steel in South Africa's water security?

JT Water loss on the scale we are experiencing, especially with the current water crises being experienced, has major economic and environmental implications for South Africa and other countries around the world.

Sassda, together with local municipal authorities and South African manufacturers, has undertaken a test project in Paarl to determine the most environmentally friendly and economical solution for the country's water-wise future.

Case studies show that 95% of treated water leaks occur in small-diameter service pipes connecting the distribution pipes to the users' water meters. Currently, approximately 40% of Johannesburg's treated water supply is non-revenue water, equating to a loss of R1.1 billion per year. Of this, 73.3% is lost due to pipe leakage.

This is largely because water pipes are currently made from, or replaced with, high-density polyethylene (HDPE), with a lifespan of 20 years, as opposed to stainless steel applications with a lifespan of at least 60 years.

Our test installation is under way in a residential unit in Paarl where it will evaluate the installation of corrugated stainless steel tubes connected to the bulk supply line. The initial stage has seen both dummy pipes and 316 stainless steel pipes, manufactured by INOX Systems, installed at Honeydew Country Estate. These have been installed and covered in such a way that they can be easily removed for inspection.

At this stage, INOX Systems is the main local manufacturer of the South African requirement of 0.3 mm thick continuously corrugated piping, which ensures the pipeline is strong enough to withstand both weight and road surface vibration. However, prominent members in the automotive exhaust systems industry also have the ability and capacity to produce big volumes of the tubes. Sassda is also engaging with Drakenstein Municipality, which has agreed to undertake a stainless steel pipe pilot project.

What are the further potential applications for stainless steel in the area?

The potential for stainless steel water supply installations in the municipal area is huge since it covers a large geographic area of populated land. Current infrastructure upgrades include the Berg River Boulevard extension, which will act as an additional link for residential development from Helderberg and Stellenbosch to the N1 Paarl, Mbekweni and Wellington.

Has stainless steel been successfully used in other parts of the world?



John Tarboton, Executive Director, sassda

At this year's International Stainless Steel Forum (ISSF) annual meeting, the forum launched an initiative to promote the use of stainless steel water pipes. It presented an analysis of three case studies where stainless steel has been used for water pipes, drawing conclusive evidence that stainless steel is the best material of choice when considering environmental and economic considerations.

Tokyo, for example, started investigating a solution to its dwindling water supply as early as the 1970s. From 1980 to 2012, it replaced all service pipes with stainless steel pipes, reducing water losses from 17% to 2% over the 32-year period. Seoul and Taipei soon followed Tokyo's example and have since dramatically reduced their water losses with the use of corrugated stainless steel pipes.

Where does Sasda fit into this picture?

Sasda is very much a part of these market developments, in line with the strategy of the global ISSF projects where we have access to new applications and development-changing technology. We recently hosted a visit from international collaborators and, together with current evaluations, we can offer solid South African evidence of the advantages of stainless steel's durability and longevity over that of HDPE pipes, which are currently cracking and leaking.

We are also working with Sasfin to explore ways of providing financing options for the installation of stainless steel service pipes funded by the savings made from the municipality through non-revenue water savings.

What is the case for stainless steel for water supply systems in South Africa?

Stainless steel presents higher installation costs, but ultimately offers a longer lifespan and reduced maintenance costs. With the use of corrugated stainless steel piping, the need for joints in the system is reduced, allowing the pipes to maintain their strength, improve workability and extend service life.

There is a clear case of cost savings both on the treatment of water that is lost through leakage, as well as water that municipalities are unable to charge service fees. Stainless steel is an optimal material in water system applications and, while it comes at a price, it is an investment in the country's infrastructure. The benefits and cost-savings will still be seen 100 years from now.

Unfortunately, short-sighted, cost-cutting practices do not serve our future. The implementation costs of stainless steel should instead be viewed as a cost-saving opportunity, where initial outlay would be recouped through the savings gained in reduced energy costs and streamlined monitoring and billing systems.

If finance companies could see fit to finance the implementation of stainless steel systems based on the savings gained from wasted and unauthorised water usage costs, return on investment and total project costs could be built in to the financing structure and provide a compelling initiative for South Africa's water distribution services.

We also have the ability and technology available here in South Africa to manufacture the specified stainless steel pipes, something which could be a coup for our manufacturing industry, both at an incubator level and as a commercial enterprise. If our municipalities are already investing so heavily in leakage repairs and replacement piping, it makes sense to replace outdated pipe systems with stainless steel.