SAPPMA
southern african plastic pipe manufacturers association

NEWS FROM THE PIPELINE
AUGUST 2020
The official newsletter of the Southern African Plastic Pipe Manufacturers Association (SAPPMA)

FROM THE CEO'S DESK

Dear SAPPMA / IFPA members and readers,

After the passing of a natural storm such as a tornado or tsunami, it is always followed-up by damage assessment - first in terms of human life, then what the physical destruction was and finally what the cost of repairs would be.

Our country, like the rest of the world, has just been through a severe storm. While it has not yet completely passed, assessments of the damage caused is already underway. From a human, financial and political viewpoint, the cost is almost incalculable and the after-effects will be with us for many years.

Even though our industry was also battered, we are very grateful that it has not been destroyed and progress is being made slowly but surely to get us back to full functionality. This is wonderful news! The importance of the plastic pipe industry can be illustrated by a simple example: if the annual pipe production tonnage is converted into 110mm class 10 HDPE and 110mm class 9 uPVC, there would be enough pipe to go around the earth more than two times.

SAPPMA will therefore continue to create awareness of the critical importance of the pipe industry and we will continue to serve the interests of our members.

As Omar Khayyam, an eleventh century Persian mathematician and poet, so eloquently wrote: “The Moving Finger writes; and, having writ, moves on: nor all thy piety nor wit shall lure it back to cancel half a line, nor all thy tears wash out a word of it.”

What has happened is water under the bridge; we continue with renewed energy and focus!

Until next time, happy reading!

Jan Venter

SAPPMA'S HISTORY OF BUILDING A LEGACY OF QUALITY & TRUST

It has been roughly 60 years since plastic pipe became commercially available on the South African market. We look back at how SAPPMA came to be established as the industry Assocoiation it is today and how it has grown over the last few years.

1960

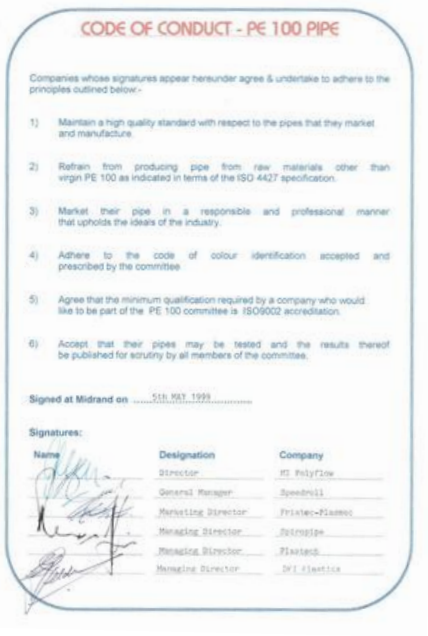
Plastic pipe became commercially available in South Africa roughly 60 years ago. PVC was first, followed by HDPE and PP. In those years, PP pipes were very popular and produced in direct competition to HDPE pressure pipe. They were available in quite large sizes (more than 400mm diameter). Since then, it has all but disappeared from the SA pressure pipe market.

Despite of the relative newness of plastic materials for pressure pipe, the early pioneers showed remarkable resilience and innovation and managed to do an excellent marketing job in order to establish the industry.

In terms of quality, national standards, testing and certification, the SABS was the only available authority. Although products of outstanding quality were produced, far less emphasis was placed on in-house laboratories at factories at the time, while the scope of relevant standards was much smaller than now.

1999

The first steps to bring order and structure to the industry were taken in 1999, when a small group of experts drew up the PE100 Code of Conduct (see image right).



CODE OF CONDUCT - PE 100 PIPE

Companies whose signatures appear hereunder agree & undertake to adhere to the principles outlined below:-

1) Maintain a high quality standard with respect to the pipes that they market and manufacture.

2) Refrain from producing pipe from raw materials other than virgin PE 100 as indicated in terms of the ISO 4427 specification.

3) Market their pipe in a responsible and professional manner that upholds the ideals of the industry.

4) Adhere to the code of colour identification accepted and prescribed by the committee.

5) Agree that the minimum qualification required by a company who would like to be part of the PE 100 committee is ISO9002 accreditation.

6) Accept that their pipes may be tested and the results thereof be published for scrutiny by all members of the committee.

Signed at Midrand on 5th MAY 1999

Signatures:

Name	Designation	Company
	Director	M3 Polyflow
	General Manager	Speedroll
	Marketing Director	Pristec-Plasmec
	Managing Director	Dutrodipe
	Managing Director	Plastech
	Managing Director	DPI Plastics

2004

Recognising the need for a central coordinating body and a unified voice representing the plastic pipe producers in South Africa, a small group of prominent pipe producers and polymer suppliers got together in 2004 to form the South African Plastic Pipe Manufacturers Association. It was registered as a Section 21 company not for gain, a voluntary association of all role players in the critically important pipe industry.

The name was later changed to "Southern African Plastic Pipe Manufacturers Association" to recognise members outside of our borders

The founding members of SAPPMA were Tony Dean *(Petzetakis Africa)*, Glenn Geldenhuis *(DPI Plastics)*, Wally van Coller *(Amitech South Africa*, Dave King *(Marely Pipe Systems)*, Gavin Brimacombe *(Protea Polymers)*, Alan Cameron *(Sasol Polymers)* and Bernhard Mahl *(Dow Plastics)*.

These seven founding members each donated R100 000, on which the first budget was based (1 March 2005). Jan Venter was appointed as the CEO.

SAPPMA: THE EARLY YEARS

Right: examples of SAPPMA' earliest promotional material

SAPPMA's first 'Management Committee' consisted of the seven founding members, plus Anton Hanekom (Plastics Federation), Gary van Eyk (Sun Ace South Africa), Patrick Palmer (Palmer Rubber and Mike Peach (Chemserve Systems).

With no blueprint available, innovation, experience and an entrepreneurial spirit were essential in the establishment of this entity. The only 'employee' at that stage was Jan Venter, in a part-time capacity, while considerable support was given by Bill Naude and Anton Hanekom of the Plastics Federation (now Plastics SA).

STATEMENT OF PURPOSE

"SAPPMA (Southern African Plastic Pipe Manufacturers Association) is the only representative association that is dedicated to the interests and benefits of the plastic pipe business in Southern Africa. With its members responsible for more than 80% of all plastic pipes produced in South Africa, it is without doubt the official mouthpiece and watchdog of this very important industry. Membership includes the polymer producers in the country as well as the major producers of related raw materials required for the production of world class pipes.

Not only is this a multi-billion Rand industry, but also an extremely critical one, producing products that are essential in the expansion and maintenance of the infrastructure of countries in Africa. Markets range across the whole spectrum of water distribution, sewage, mining, industrial and telecommunication. SAPPMA serves the whole community, ensuring peace of mind with enduring quality products and environmental responsibility."

In parallel to all the internal activities, the external market also had to be made aware of the need and benefit of a single body representing the plastics pipe industry.

In addition, the awareness of recognised international standards and long-term product quality had to be developed.

Because product long-term quality was the primary focus of SAPPMA, early contact was made with the SABS in order to create a healthy work relationship.

Ever since then, we have endeavoured to interact closely with them on all matters related to standards and quality.

SAPPMA was instrumental in the formation, motivation and support of alternative service providers for product testing and certification. Today we have four accredited certification authorities as members, while the only SANAS accredited pipe laboratory is strongly supported by SAPPMA

LOOKING AHEAD: QUO VADIS?

In spite of notoriously difficult business conditions in South Africa, the plastics pipe industry has continued to serve all citizens with high quality, long-life pipes,for the essential transportation of water and wastewater.
It is clear that SAPPMA's role and presence in the industry over the years has created a great deal of comfort in the market. (It has been confirmed by many individuals that this industry would have been in a far worse state was it not for the intervention of SAPPMA).

Looking ahead at the years to come, the purpose of SAPPMA will continue to be "to create absolute consumer confidence within the plastics pipe industry and to ensure long-term sustainability of high-quality plastic piping systems".

SAPPMA WILL CONTINUE TO DO EVERYTHING IN ITS POWER TO SUPPORT AND ENHANCE THIS ESSENTIAL SERVICE. OUR FOOTPRINT IS WELL ESTABLISHED AND CONTINUES TO GROW. TOGETHER WE WILL RESIST ANY DETERIORATION OF THIS CRITICALLY IMPORTANT INDUSTRY!

SAPPMA HOSTS QUALITY WORKSHOP ON SEWER SYSTEMS

SAPPMA hosted the fourth instalment of its very popular Quality Workshops on the 22nd of July 2020, focusing on various aspects related to sewer systems. Due to the COVID-19 restrictions that were still in place, it was decided to host this workshop as an online webinar. This allowed the SAPPMA team the privilege of having local and international experts in sewer systems present and share their expertise, and being able to accommodate a larger group of delegates (from outside Gauteng) than would usually be the case.

“Maintaining functional and efficient water and sewer networks requires an adherence to stringent design and product standards that extend the life of these vital assets. It is therefore important to look at the various elements that go into developing and maintaining such a network and the important role plastic pipes play in ensuring the effectiveness of these systems", said Ian Venter, SAPPMA's Technical Manager who hosted the workshop.

By critically assessing the different aspects that go into a successful sewer pipeline design, installation and maintenance, the presenters all touched on the fact that thermoplastic pipe is a vital component of modern systems that are able to meet the needs of the communities they serve for 100 years or more.

Plastic pipes are long-lasting, practical & affordable

“Water and sanitation infrastructure, alongside housing, are pressing priorities in South Africa today. Local and national government has a crucial role to play in uplifting communities by addressing inequality gaps and the implementation of effective sewer and waste management systems for all its citizens – including the poorest of the poor,” said Vollie Brink.

“PVC and HDPE pipes offer a solution that is long-lasting. Compared to steel and concrete, plastic pipes are well-suited to labour intensive construction techniques. Unlike with steel, there are no concerns about costly cathodic protection requirements when using plastic pipes..."

Plastic pipes are sustainable

Albert Vaartjes, the Global Sales Manager RBleu PVC-O at Rollepaal in the Netherlands and an international expert in PVC pipe manufacturing, was the second presenter. His presentation focused on the benefits of using multi-layer PVC pipes when designing sewer pipelines.

“Sustainability and promoting a circular economy are of utmost importance and therefore play a key role in the conceptual approach. Multi-layered PVC pipe systems allow us to reuse post-consumer and own-inhouse recycled material in specific applications. In addition to their lower environmental impact, multi-layer sewer PVC pipes also have the required properties to design life,” Albert said.

Non-pressure systems (multi-layer pipe) and pressure systems (PVC-O pipe) are currently two of the key areas of focus at Rollepaal. The company’s R&D team embraces the use of modern, low volume die-heads, automatic thermal centring, inline production systems and continuous process improvements to address the need for reducing the carbon footprint.

Plastic pipes are resistant to corrosion

Having been involved with many of the major outfall sewers in South Africa for over 40 years, Alaster Goyns shared some of his experience in the development, introduction and launching of cementitious and inert lining systems for sewer pipes in the South African market.

“Different types of pipelines require different types of material. It is important to understand the needs and the conditions of the specific community before you start designing or specifying which material will be used. Each application should be fit for purpose, with a major emphasis on minimising maintenance and a corresponding focus on optimising lifecycle costs,” Alaster said.

QUALITY WORKSHOP (Continues)

Corrosion is one of the biggest issues with sewers that can render them structurally unsound and no longer watertight. Traditionally, high-pressure pipelines were made from steel with coatings bonded to the steel pipe in order to protect them. On the other hand, sewers that were gravity pipelines of 300mm and larger in diameter were traditionally made from concrete.

Alaster stressed that it is important to bear in mind that these pipelines are generally placed at depth and follow natural water courses, where they are subjected to external water pressures.

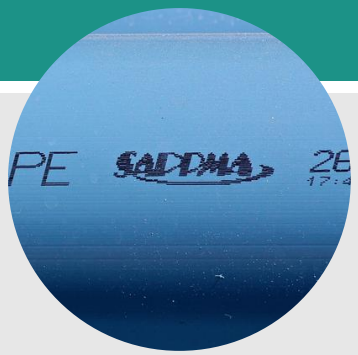
Plastic pipes allow for trenchless pipe rehabilitation

Johann Wessels, a registered professional engineer specialising in alternative sewer pipe materials and the effective utilization of alternative construction techniques, focused on sewer condition assessment and rehabilitation making use of trenchless technology.

“Trenchless technology is ideal for the servicing, rehabilitation and replacement of existing public utilities and other services underground without the digging of trenches. It also includes the development of all kinds of underground mapping techniques, tunnelling devices and specialist machinery, materials and equipment,” Johann said, explaining the various different rehabilitation methods that are available for existing services.

"The rehabilitation of pipelines with plastic linings designed to resist the groundwater pressure that developed between the host pipe and liner presented a long-lasting solution with a design life of 100 years or more..."

For non-conventional construction of new pipelines one can consider using pipe jacking, micro-tunnelling, auger boring, horizontal and directional drilling, pipe ramming or impact molling as alternative trenchless techniques, rather than conventional open excavation. Further rehabilitation options include pipe bursting, slip lining, spirally wound lining, and cured-in-place pipe. Many of these techniques are done effectively and efficiently making use of thermoplastics or thermoplastic pipes.



3RD PARTY CERTIFICATION

Offering peace of mind and quality guarantee

Home owners or end-users might be concerned about plastic piping meeting performance standards. It is then that SAPPMA members should inform them about third party conformity assessment marks.

The maximum level of compliance proof or assurance is normally achieved by use of an independent third party whose responsibility includes unannounced plant visitations to select products for compliance testing.

Products that have passed the conformity assessment will have the third party's "mark" on the product.

SAPPMA as an independent association that plays an important role in ensuring the understanding and effective implementation of standards in the Southern African landscape. Only once members have passed their audits and successfully proved that their pipes adhere to the strict quality guidelines set out in the Association's Code of Conduct, are they awarded SAPPMA membership.

SAPPMA has developed a list of commonly required procedures, documents and process controls that are assessed during our factory audits to achieve consistent and repeatable results. This is vital for specifiers when they order products for infrastructure projects. In the same way that a chain is only as strong as its weakest link, a pipeline is only as good as the integrity of the pipes, joints and fittings that are used.

Seeing the SAPPMA logo on a pipe and fitting is considered to be a major differentiator in an industry where shortcuts are all too easily taken. We believe it will continue to play a more prominent role going forward as it allows our members to show their clients their commitment to quality and offers the end-user the product assurance they need.

KEEPING UP A GOOD FLOW

The smooth, inner bore of plastic pipes minimises friction loss, requires less pumping energy and helps maintain a steady flow – contributing to significant cost savings and environmental benefits. In the case of gravity pipelines, self-cleaning velocities will be achieved at gradients not possible for traditional materials.

Plastic pipe systems are manufactured in long lengths and therefore have a much lower joint frequency than traditional systems, thereby drastically reducing friction losses as well as potential leaks.

Invest in good quality plastic pipes bearing the SAPPMA mark of quality for peace of mind. These pipes have been locally produced and manufacturers undergo regular, independent auditing to confirm they meet stringent local and international standards.

When the pipes reach their end-of-life as water and sewer systems after 100+ years, it can be recycled and thereby play an important role in contributing to the circular economy. **Visit www.sappma.co.za for more information.**

GOOD FOR 100 YEARS

SAPPMA

southern african plastic pipe manufacturers association

SHOULD YOUR CUSTOMERS BE REQUESTING A 3.1 INSPECTION CERTIFICATE?

SAPPMA has noticed an increase in the number of purchasers requesting a 3.1 Inspection Certificate in accordance with EN10204. Most manufacturers and distributors are used to purchasers calling through their tender documents for (COC's) Certificate of Conformance, COA's Certificate of analysis, and/or Data Packs.

Specific projects call for EN 10204 Type 2.1, 2.2, 3.1, 3.2 documentation and they have specific reasons for doing this. To normalize the understanding of these requests we offer the following comments:

- The EN 10204 standard is a standard related to Types of Inspection documents. Although the title of the document reads *Metallic Products,* the scope of the document makes it applicable to non-metallic products, such as thermoplastics as well.
- This standard is used in conjunction with the product specification and its standards to be met, which specify the technical delivery conditions of the product.
- This document specifies the different types of inspection documents to be supplied to the purchaser by the supplier with the requirements of the order for the delivery of non-metallic products, whatever their method of production. Extrusion, fabrication, injection molding and forming are all included in the standard.
- Annexure A EN10204 gives a summary of the different inspection documents under the headings of, reference, designation of document type, document content and document validated by.
- Our typically used COC will coincide with the EN10204 Type 2.1 document and the COA will coincide with the Type 3.1.
- In the case of the Type 3.1 (Reference) it will be an inspection certificate (Designation of Document type) issued by the manufacturing company/supplier in accordance with EN 10204. The document validation will be done by the manufacturers authorized inspection representative independent of the manufacturing department (Validated by).
- The content of the document will be a Statement of Compliance with the order, with indication of specific results of specific inspection (Document Content).
- Our traditional data pack will be typical production records and form part of supporting documentation for Type 2.2, 3.1, and 3.2 inspection certificates in the case of EN 10204 inspection documents.

GOOD FOR 100 + YEARS

A recently published Position Paper by TEPPFA and PVC4Pipes has confirmed the 100-year lifetime for PVC-U and PVC-Hi pressure pipe systems buried in the ground for water and natural gas supply

TEPPFA and PVC4Pipes have identified the need for explaining the difference between the design point at 20 degree Celsius / 50 years and the expected lifetime of PVC-U and PVC-Hi (PVC-M) pressure pipe systems. Research, extrapolation studies and studies of dug-up pipes in service for years, show minimal degradation and extrapolative tests performed on these test samples confirm an expected service life in excess of 100 years.

Design basis of the pipe material VS actual service life of the pipe system

Design basis must not be confused with the actual life time of a plastic pipe system. In real life, the service life is expected to be more than 100 years due to a number of reasons, amongst others:

- Lower real pressure level (stress) over whole lifetime
- Lower real temperatures in the ground
- Tolerances for wall thicknesses are always “plus"
- In the design stage a safety factor is applied

Design basis of PVC pressure pipe systems

The 50 year design basis and minimum service life for a PVC pressure water of gas pipe system is secured through the established standards SANS ISO 9080 and ISO 12162. SANS ISO 9080 provides an extrapolation method to estimate the 97.5% lower prediction limit of the stress (σLPL) which a thermoplastic pipe is able to withstand for 50 years at 20°C.

Extrapolation is made from data obtained through hydrostatic pressure tests carried out at different temperatures in accordance with ISO 1167-1 and ISO 1167-2. ISO 12162 establishes a classification and designation system for thermoplastic pipes, based on their minimum required strength (MRS) derived from their σLPL. A PVC-U pipe with 25 MPa $\leqslant$ σLPL<28 MPa has a MRS of 25 MPa and is designated as PVC-U 250. ISO 12162 also specifies a method for calculating the design stress σs from the MRS and a design coefficient (Cmin=1.6 for PVC-U, Cmin =1.4 for PVC-Hi (PVC-M) is used.The product standard ISO 1452 specifies the specific requirements for a solid wall PVC-U piping system and its components intended for the supply of water under pressure, as well as for waste water under pressure. ISO 1452-1 sets general requirements for the PVC-U compounds used in these systems. Whatever its composition, a compound needs to reach σLPL corresponding to a MRS of 25 MPa for all pipes and fittings. A MRS of 20 MPa is allowed for some injection moulded fittings.

If long-term experience is available with a compound known to have a MRS of 25 MPa, a streamlined testing scheme to verify compliance can be used.

GOOD FOR 100+ YEARS

PVC-U has been in practical use for water systems for more than 80 years and monitored closely ever since by the water utilities for performance, reliability and maintenance management.

ISO 1452-1 recognizes in its paragraph 3.1.5.1., that “research on long-term performance prediction of existing PVC water distribution systems show possible service life of at least 100 years”.

PVC has been the preferred material for low pressure (30 and 100 mbar) gas distribution systems in European countries such as the Netherlands for more than 60 years. PVC-U has been used up till the 1970’s and has been progressively replaced by PVC-Hi since this time as it was thought that PVC-U could not be able to keep a high impact resistance needed in case of third party interference. The product standard ISO 6993-16 specifies the specific requirements for a PVC-Hi piping system used for the supply of natural gas. The PVC-Hi compound should contain at least 7% w of impact modifier and, whatever the remaining composition of the compound, the extruded material needs to reach a LPL corresponding to a MRS of 18 MPa as determined by ISO 9080.

While similar PVC resins are used in all the pressure pipes tested above (K-value in the 66-68 range, similar polydispersity), stabiliser packages differ depending on the region. The above consistent results obtained across all regions, demonstrate that a reliable service in excess of 100 years can be obtained whatever the stabiliser used.

The overriding factors influencing the long term performances are the initial pipe quality and the quality of the pipe handling and installation procedures. Ensuring an optimum gelation level is the most important initial pipe quality factor to ensure an optimal balance of mechanical performances on the long term. The gelation level can be qualitatively evaluated by the Dichloromethane Test (ISO 9852) or by the indirect quantitative DSC methods (ISO18373-1 and ISO18373-2).

Download the complete White Paper from https://pvc4pipes.com/2019/04/30/ample-evidence-for-100-year-service-life-for-pvc-pipes/

STUDIES PROVE A 100+ YEAR SERVICE LIFE

The first PVC pipes were manufactured in 1934 in the Bitterfeld-Wolfen chemical area (Germany). These pipes were used for different applications such as potable water pipes, transparent food contact. This is confirmed by many dig-up reports reporting the mechanical performances of PVC-U and PVC-Hi pressure pipes installed by contractors at a variety of locations and in continuous service for decades.

In 1985, Lancashire studied PVC-U water pipes exhumed after 4 to 16 years' service in the UK, and concluded that ageing was not a significant factor influencing the performance of the pipes. Stress regression tests showed that all pipes would be expected to exceed a 100-year life under normal operating conditions.

In 1996, Alferink et al tested PVC-U pressure pipes exhumed from the Dutch water network ranging up to 37 years of age. From 19 pipe samples, it was concluded that there was virtually no change in the mechanical properties of the pipes due to ageing. They concluded that old PVC-U water pressure pipes still fulfill the most important functional requirements.

In 2014, Folkman reported on quality control tests on PVC-U water pipes that had been in continuous service between 20 and 49 years. The standardized tests included pipe dimensions, acetone immersion, burst pressure and hydrostatic integrity tests. Samples of the pipe having been successfully tested after 49 years’ service had already passed all the quality control tests after 22 years’ service. This has demonstrated the intact ability of this quality pressure PVC-U pipe to perform its intended purpose after a half century.

PLASTIC PIPES: THE SUSTAINABLE OPTION

Despite common misconceptions, plastic piping is more energy efficient than metal alternatives. The manufacturing of plastic pipe and fittings required 56,497 trillion fewer BTUs than iron and concrete/aggregate alternatives in the building, construction, and transportation industries.

For reliable, safe, cost-effective, energy-conscious building materials, plastic piping should be part of your next set of job specifications. Here's why plastic pipes are the sustainable option:

- **Safe and reliable**
  Starting with its own low-energy manufacturing process and continuing through delivery, installation and long-term durability, plastic piping delivers the qualities you except from 21st century products.

- **Durable**
  Plastic piping has a significantly greater life expectancy than metal counterparts. Plastic piping is not degraded by underground water and soil, nor by contaminants or acidity in waste or sewage passing through it. The physical characteristics of installed plastic piping changes very little over time. Examinations of plastic piping samples show no measurable degradation after 50 years or more of service. Safely delivers water, waste or chemicals.

- **Plastic piping is an effective weapon in the war against disease.**
  Because plastic piping is not subject to pitting and corrosion, it safely contains and delivers, and effectively removes water, waste, or chemicals without contamination. Plastic piping is the ideal choice to convey chemicals for water treatment and for many other processes.

- **Easy to install & meets building code requirements nationwide**
  Plastic piping systems weigh less and install quicker than metal piping. The savings in energy, freight charges, manpower, and more simple hoisting and rigging equipment, mean significant savings in time, energy and costs for each project utilising plastic piping systems.

Plastic piping is assembled using gasket, other mechanical means, or solvent cement. No lead pot and torch is needed, saving time, energy, and resources and reducing workplace hazards. Plumbing and building codes govern the use of construction products and their methods of installation. All major codes allow plastic piping.

- **Third party certified to meet health and safety standards**
  Plastic piping products designed to deliver potable water are certified to meet the requirements of ANSI/NSF Standard 61, an industry-leading standard that addresses relevant health issues and protects the user from unwanted and dangerous contaminants through comprehensive risk analysis.

- **Clean, low-energy manufacturing**
  The energy efficiencies of manufacturing plastic pipe and fittings also conserves resources. In fact, the manufacture of plastic pressure piping used in the building, construction, and transportation industries required 56,497 trillion fewer BTUs than iron and concrete/aggregate alternatives.

Because plastic pipe and fittings are significantly lower in weight than metal piping, they save energy in transportation, a significant cost factor in today's construction planning.

For more information, visit www.ppfahome.org/page/sustainability

WHEN SIZE MATTERS....

INKULU PLASTICS BECOMES FIRST SA PLASTIC PIPE MANUFACTURER CAPABLE OF PRODUCING 1200MM DIAMETER PIPES

KZN-based Inkulu Plastic Pipes has reached another milestone by becoming the first plastic pipe manufacturer in South Africa capable of manufacturing large diameter (1200mm) pipes.

The company opened its doors for the first time in September 2014 and has successfully been manufacturing high quality HDPE pipes which ranged from 16mm to 630mm and pressures PN4 up to PN25.

"However, our vision has all along been to build our capacity to the point where we would eventually be able to produce 1200 mm pipes," says Faize Gafoor, National Sales and Marketing Manager of Inkulu Plastics.

This dream became a reality in December 2019 when the company became the first South African company to successfully commission a 1200 mm pipe extrusion line.

"We are very proud of this accomplishment as it means we now have the capability to meet our clients' needs by being able to produce the bigger sized pipes (ranging between 710 mm - 1200mm) in addition to our standard, smaller sizes," Faize says.

INKULU PLASTIC PIPES PTY LTD
DARE TO COMMIT

For more information visit www.inkuluplastics.co.za

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