

FLOWTITE

SOUTH AFRICA



Corporate Profile

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Our Vision is for Flowtite GRP Pipes to be a household brand in the piping market within Sub-Saharan Africa for civil, mining, agricultural, industrial applications. "Generally Accepted and Generally Approved".

Our Mission is to remain at the cutting edge of technology development in the piping market. To remain devoted to high quality standards, excellent customer service, reliability, accountability and transparency in order to offer superior value to our customers infrastructure requirements. Thus creating an enduring benefit for our communities and our customers through our Flowtite GRP Product Range.



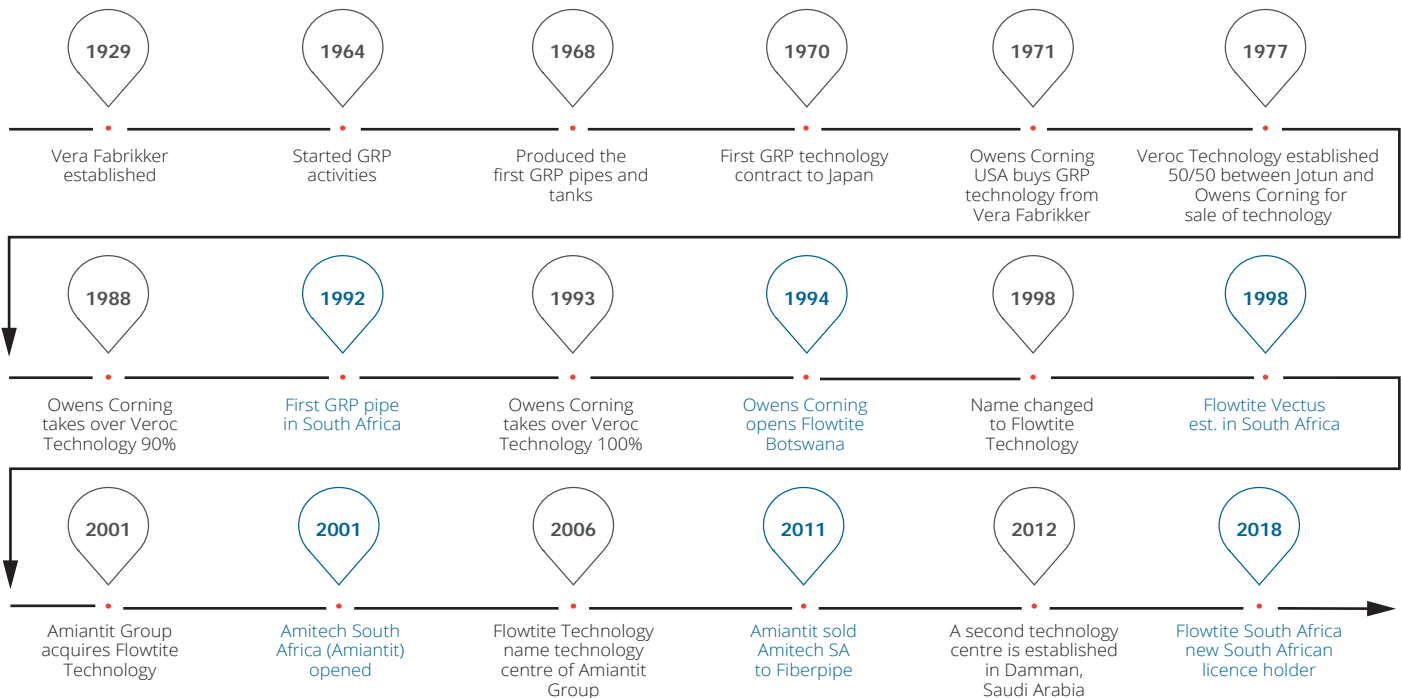


BRIEF HISTORY

Flowtite Technology can trace its history back to the 1960's, when its predecessor, Vera Fabrikker, a Norwegian company, invented the world's first continuous filament wound pipe. The system was patented in 1967. This paved the way for groundbreaking developments in GRP manufacturing technology and a successive series of proprietary innovations that has maintained Flowtite's global leadership.

Today, Flowtite's worldwide footprint is represented by a network of international manufacturing facilities. The centre of excellence remains housed at Flowtite Technology's Sandefjord headquarters in Norway. Flowtite South Africa joined the group as a manufacturing licensee in June 2018.

TIMELINE / A WORLDWIDE SUCCESS



OUR QUALITY MANAGEMENT SYSTEMS

- All products are produced in accordance with specified requirement
- Continuous improvement of product quality and services provided

QUALITY CONTROL

All pipes are subjected to the following control checks:

- ▶ Visual inspection
- ▶ Barcol hardness
- ▶ Wall thickness
- ▶ Section length
- ▶ Diameter
- ▶ Hydrostatic leak tightness test to twice rated pressure for all pressure pipes

The following control checks are regularly performed on samples:

- ▶ Pipe stiffness
- ▶ Deflection without damage or structural failure
- ▶ Axial and circumferential tensile load capacity
- ▶ Material composition analysis



PRODUCT RANGE

Flowtite manufactures GRP-Pipes for:

- Potable Water transfer
- Raw Water
- Irrigation
- Sanitary sewerage systems
- Penstock pipes for Hydro-Power plants
- Marine intake-/outfall
- Rehabilitation
- Circulating cooling water
- Industrial above-ground applications
- Slurry
- Fire fighting

TECHNICAL INFORMATION

Diameters: DN 300 – 1 800mm

Pressure classes: PN 1-6-10-12-16-25-32

Stiffness: SN 2 500, 5 000, 10 000

Length: Standard length 12m

*Large diameters available on request

ADVANTAGES

Characteristic	Advantage
Corrosion-resistant	- long service life
Lightweight	- low transportation cost - no expensive handling equipment
Standard lengths, 12m	- fewer joints - reduced installation time
Smooth bore	- low friction loss - lower operating costs
Superior hydraulic characteristics	- low flow coefficient - minimal slime build-up - excellent abrasion resistance
Precision Flowtite REKA coupling	- tight joints designed to eliminate infiltration/exfiltration - ease of joining reduces installation time - accommodates slight deflection in line direction - without additional fittings
Flexible manufacturing process	- custom diameters can be manufactured to provide maximum flow volumes with easy installation for slip-lining projects - custom lengths can be manufactured
Advanced technology pipe design	- multiple pressure and stiffness classes to meet engineers' design criteria

SERVICES

In addition to products of high quality FLOWTITE assists with advisory services to select the most suitable material for the conditions of the specific project. Support is given during the design process to ensure that the design caters for all the requirements as pertained in our brochures. Further more onsite technical support and training is provided during installation to ensure that the correct installation procedures are followed for optimal use of our products. This assistance, installation and training are always supplied free of charge.

In countries outside of South Africa subsistence and travel may be for the clients account, GRP pipes are maintenance free but FLOWTITE do provide emergency repair training for the clients who will be responsible for the repair of mechanical damage to the pipes. This will attribute to a pipeline which will last much longer than the design life of 50 years.

FLOWTITE GREY

HIGH IMPACT GRP PIPE

FLOWTITE GREY is a new Flowtite pipe. Grey is the culmination of a programme in materials, pipe design and processing methods for superior performance.



Flowtite Grey is more impact resistant, which means that more crushed rocks can be used for the trench backfill. That lowers

Flowtite Grey is more abrasion resistant, which gives the pipe a longer life when it contains abrasive material like gravel and sand.

Flowtite Grey is more water jet resistant.

Continuously wound GRP, which was invented by Flowtite pioneers, is a fantastic technology. With this new pipe, Flowtite Grey, Flowtite is ahead of competition.

STANDARD vs GREY

Standard Flowtite Properties	Flowtite Grey Properties																				
 <p>Flowtite pressure pipe is the most commonly used pipe for pressure and gravity applications, with a 50 year long proven track record. It is compliant with all international performance standards.</p>	 <p>Flowtite Grey is another step beyond with its superior performance for demanding applications.</p>																				
<p>Impact Resistance Good impact resistance, maintains resistance to burst. Some care in handling & installation required.</p>	<p>Impact Resistance Improved impact resistance. Superior performance in impact tests. High resistance to burst (hoop stress).</p>																				
<p>Abrasion Resistance Good resistance in most pressure and gravity applications.</p>	<p>Abrasion Resistance Improves resistance. Data from design basis testing. Design cycles estimated <0.2 million cycles per test according to DIN 19222.</p>																				
<p>Water Jetting Resistance Acceptable but limited water jetting resistance – lower cleaning pressures.</p>	<p>Water Jetting Resistance Improved water jetting resistance. Superior performance in water jetting tests.</p>																				
<p>Backfill Particle Size Nominal maximum particle size in the pipe zone (up to 300 mm over the pipe crown).</p> <table border="1"> <thead> <tr> <th>DN</th> <th>Max. size (mm)</th> </tr> </thead> <tbody> <tr> <td>DN up to 450</td> <td>13 mm</td> </tr> <tr> <td>DN 500 to 600</td> <td>19 mm</td> </tr> <tr> <td>DN 700 to 900</td> <td>25 mm</td> </tr> <tr> <td>DN 1000 to 1200</td> <td>32 mm</td> </tr> <tr> <td>DN 1300 and above</td> <td>40 mm</td> </tr> </tbody> </table>	DN	Max. size (mm)	DN up to 450	13 mm	DN 500 to 600	19 mm	DN 700 to 900	25 mm	DN 1000 to 1200	32 mm	DN 1300 and above	40 mm	<p>Backfill Particle Size Larger particles permitted. Superior performance in backfill tests. Larger maximum particle size (up to 400 mm over the pipe crown).</p> <table border="1"> <thead> <tr> <th>DN</th> <th>Max. size (mm)</th> </tr> </thead> <tbody> <tr> <td>DN 250 to 500</td> <td>19 mm</td> </tr> <tr> <td>DN 600 to 1000</td> <td>25 mm</td> </tr> <tr> <td>DN 1100 and above</td> <td>32 mm</td> </tr> </tbody> </table>	DN	Max. size (mm)	DN 250 to 500	19 mm	DN 600 to 1000	25 mm	DN 1100 and above	32 mm
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<p>Estimated Lifetime More than 150 years!</p>	<p>Estimated Lifetime More than 150 years! Flowtite Grey performance in standard design basis testing. Superior performance in strain corrosion, long-term design basis testing. The pipe is expected to last even longer.</p>																				

FLOWTITE ORANGE

EXTREMELY WEAR RESISTANCE GRP PIPE

ation of a development
ology to offer better pipe

re native backfill or larger
costs of installation.

longer lifetime if the water

ers in the late 1960's, is a
takes another step ahead

FLOWTITE ORANGE is a new Flowtite pipe – developed by researchers and scientists at Flowtite Technology. Years of research and development have culminated in an extremely wear resistant pipe – tested and approved according to relevant international pipe standards.

Flowtite Orange is the third pressure pipe in the Flowtite pressure pipe portfolio. Compared to Flowtite Grey, Flowtite Orange is designed for more extreme wear exposure.

Flowtite Orange enables transport of fluids containing highly abrasive materials such as slurries from the mining industry, storm water containing extreme volumes of sand and gravel, and other applications with extreme wear exposure. Continuously wound GRP, invented by Flowtite pioneers in the late 1960's, is a flexible technology enabling engineers to apply new materials as well as developing new design and process technology. With this new pipe, Flowtite Orange, Flowtite takes yet another step ahead.

STANDARD vs ORANGE

Flowtite Grey Properties

Flowtite Grey takes Flowtite GRP another big step ahead. It goes beyond international standards, with new, innovative properties for demanding projects.

Performance with up to 10 times better impact testing (BS 5480, KIWA BRL). Maintains impact strength after higher impact

Resistance to Armstadt gravel abrasion to 100 000 cycles with 0.03 mm loss in liner thickness. Abrasion testing BS 565-1/EN 295-3.

Impact Resistance.

Available in diameters up to 64 mm nominal (nominal sieve size).

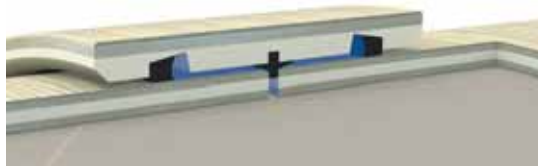
Max. size (mm)

25 mm
50 mm
64 mm

Flowtite Grey offers improved performance, tested long-term pipe testing for long-term stiffness and hydrostatic strength that means that Flowtite Grey is stronger than regular Flowtite pipes.

Standard Flowtite Properties

Flowtite pressure pipe is the most commonly used pipe for pressure and gravity applications, with a 50 year long proven track record. It is compliant with all international performance standards.



Wear Resistance

Good wear resistance for most applications.

Abrasion Resistance

Good resistance in most pressure and gravity applications.

Erosion Resistance

Good erosion resistance.

Expected Service Life

in Extreme Wear Environments

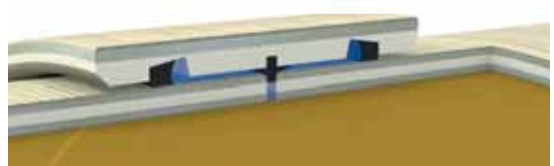
If exposed to extreme wear, Flowtite standard pressure pipes will have not as long service life as Flowtite Orange.

Flow Velocity

Flowtite pipelines sustain intermittent velocities up to 8 m/s if the water is clean and contains no abrasive material.

Flowtite Orange Properties

Flowtite Orange is a new pipe, developed for extreme wear resistance that occur in e.g. slurry pipelines, storm water and other applications where extreme wear may occur.



Wear Resistance

Extremely high wear resistance in applications where most pipe materials give up.

Abrasion Resistance

Gravel abrasion to 200 000 cycles <0.03 mm loss in liner thickness.

Erosion Resistance

Exceptional erosion resistance.

Expected Service Life

in Extreme Wear Environments

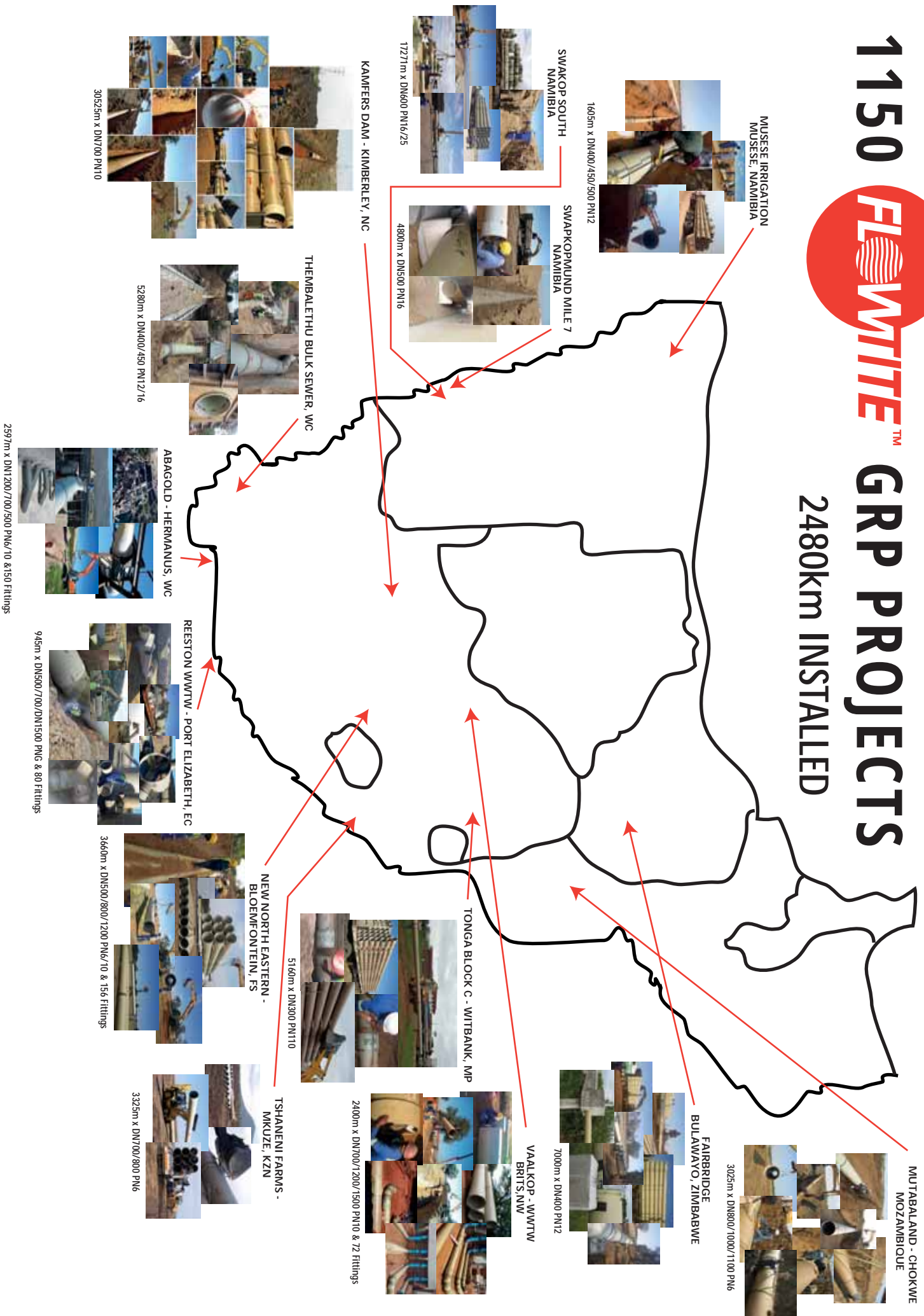
Flowtite Orange significantly increases pipeline service life.

Flow Velocity

Flowtite Orange is expected to sustain high intermittent flow velocities, maybe as high as 15 m/s, even for water with abrasive materials. Testing is still in progress, and applications with extreme flow velocities should be evaluated by Flowtite Technology before installation.

1150 FLOWWHITE™ GRP PROJECTS

2480km INSTALLED



Flowtite Technology Quality Assurance

This is to certify that

Flowtite South Africa (Pty) Ltd

7 Tielman Roos Street, Germiston South, Gauteng 1401,
South Africa

*is licensed by Amiblu Technology AS to produce Flowtite pipes according to
EN 1796, EN 14364, ISO 10639, ISO 10467, ASTM D3262, ASTM D3574,
ASTM D3517, AWWA C950, and SANS 1748
subject to conditions in agreement between Amiblu Technology AS
and Flowtite South Africa (Pty) Ltd.*

*The quality and conformity of the products is assured through audits of the
factory by Amiblu Technology AS personnel, long-term testing of products
in Flowtite or other third party laboratories and the factory's ISO9001
Quality Management System based on Flowtite's Quality Assurance Manual.*

Valid through: 2018-09-26

Sandefjord, 2019-08-05



Tomas Andreassen
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*Serving our
community
through our **FLOWTITE™**
GRP Product Range*

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