MOCKE
PIPELINE CONSTRUCTION

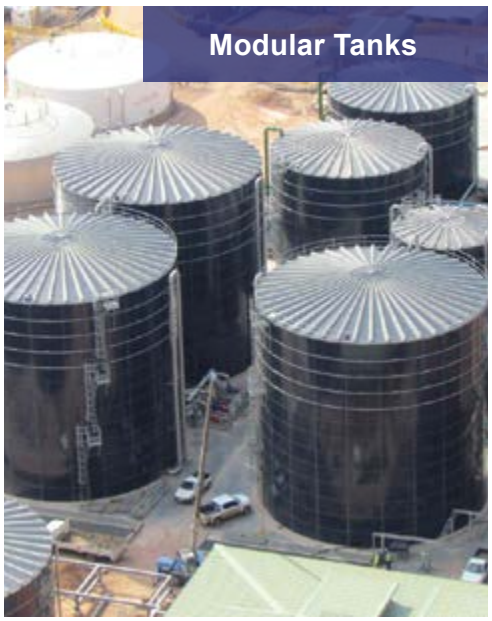
Accountable Pipeline Solutions
with Integrity

# About Mocke Pipeline Construction

*Mocke Pipeline Construction is an international pipeline construction company that offers turnkey pipeline installation solutions. With decades of pipeline experience and by using advanced technology, products and innovative techniques, Mocke is able to reduce construction time and improve the service life expectation for new, replacement and rehabilitated pipeline systems. Mocke is able to design, supply, construct, commission and maintain your pipeline, giving you the customer a complete fluid conveyance solution. Mocke is a pipeline specialist and ensures that installations are of the highest quality and partnership relationships are conducted with ethics and accountability.*

**Sure-Line® Pipe Rehabilitation**

**Steel Cross Country Pipelines**



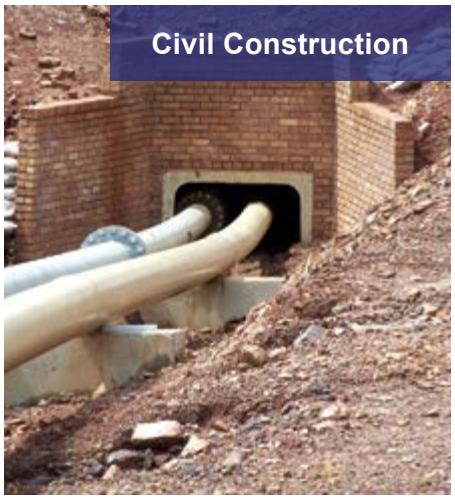
**Modular Tanks**

**HDPE Cross Country Pipelines**

## Steel Welded Tanks

## Mechanical Systems

## Pipeline Installations



## Civil Construction

## Buried Pipelines

## Plants



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# High Density Polyethylene (HDPE) Cross Country Pipeline Construction

*Mocke Pipeline Construction is a leader in the construction of cross country High Density Polyethylene (HDPE) pipelines with advanced methods to ensure that high quality pipelines are constructed in the least construction time.*

## HDPE ADVANTAGES OVER STEEL PIPELINES

- Faster installation time
- No internal lining or external coating required
- No time consuming NDT weld testing required
- Reduced flow friction in the pipe
- Easier placement of pipe in trench and backfill requirements
- Superior abrasion resistance on slurry and mine tailings pumping applications
- Longer life guarantee
- No cathodic protection required

## APPLICATIONS FOR HDPE PIPELINES

HDPE Pipelines can be used in water, slurry, waste-water, mine tailings, oil, gas and chemical applications.

Mocke supplies HDPE pipelines up to 25 bar pressure. Continuous welded pipelines reduce the number of expensive flanges and potential leak points.

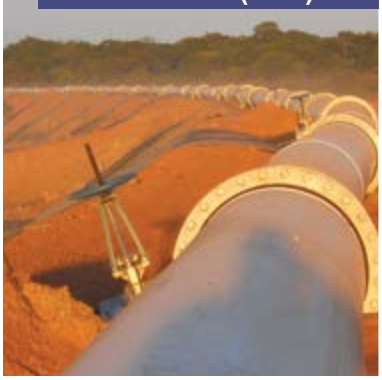
## SIZE RANGE

Up to 1000mm diameter pipe can be butt welded with larger diameters using other coupling methods.

## WELDING METHODS USED BY MOCKE

- High interfacial pressure butt fusion welding according to ISO 21307:2009(E)
- Extrusion welding for low pressure joints
- Electrofusion couplings on larger diameters or when space limitations are present
- Hot air welding
- IR (Infra Red for high purity applications)
- Socket welding for small diameters
- Innovative pipe handling techniques, rapidly welds cross country pipelines faster and with fewer people

**Tailings Storage Facilities (TSF)**



**Buried Pipelines**

## OTHER PLASTIC OPTIONS

Pipelines can be constructed with a variety of plastic materials as required by the application using a variety of installation methods. Mocke can assist with the correct plastic material selection and welding specification.

This includes

- uPVC (Unplasticised Polyvinyl Chloride)
- cPVC (Post Chlorinated Polyvinyl Chloride)
- PP (Polypropylene)
- PVDF (Polyvinylidene Fluoride)
- PTFE (Polytetrafluoroethylene)
- PFA (Perfluroalkoxy)
- GRP (Glass Reinforced Plastic - Fibreglass)
- nPE (Natural Polyethylene)
- PEX (Cross Linked Polyethylene)
- UHMWPE (Ultra High Molecular Weight Polyethylene)

**Tailings Storage Facilities (TSF)**

**Reverse Osmosis**

## SUPERIOR QUALITY

Mocke ensures the quality of installed pipelines and guarantees the welds by using a 5 point quality plan:

1. Independently tested raw material batches
2. Independently tested extruded pipe
3. Onsite (DT) destructive weld testing
4. Onsite automatic process control to ensure welding procedure is followed
5. Onsite ultrasonic weld testing to test for weld impurities



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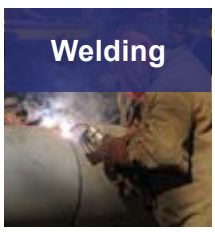
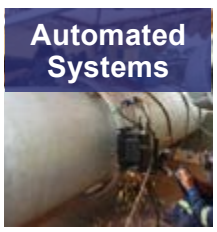
# Steel Cross Country Pipeline Construction

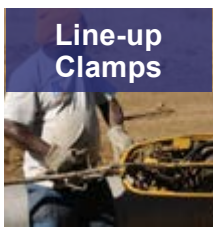
*Mocke Pipeline Construction specialises in the construction of steel cross country pipelines with advanced welding and construction methods to ensure a high quality pipeline construction in the least amount of time.*

Mocke constructs pipelines in a variety of steel material selections combined with various jointing methods above or below ground for water, slurry, wastewater, mine tailings, oil, gas and the chemical industry.

| Material Selection | Jointing Method | | | | |
|---|---|---|---|---|---|
| | Flanged | Coupled | Bell & Spigot | Continuous Butt Welded | Field Collaring |
| Carbon Steel Unlined | ✓ | ✓ | ✓ | ✓ | ✓ |
| Carbon Steel Epoxy lined | ✓ | ✓ | ✓ | ✓ | ✓ |
| Carbon Steel Concrete Lined | | | ✓ | | ✓ |
| Ductile Iron | | | ✓ | | ✓ |
| Carbon Steel Poly-lined (PE, PP, PTFE) | ✓ | ✓ | | ✓ | ✓ |
| Carbon Steel Rubber Lined | ✓ | | | | |


## WELDING METHODS

Mocke welders are procedure coded according to requirements including:

- MMA (Manual Metal Arc)
- MIG (Metal Inert Gas)
- TIG (Tungsten Inert Gas)
- STT (Surface Tension Transfer)
- FCAW (Flux Core Arc Weld)

Various NDT methods are used including:

- Phased array (Ultrasonic)
- X-Ray
- MPI (Magnetic Particle Inspection)
- Dye Penetrant
- TOFD (Time Over Flight Defraction)

## ANCILIARY PIPELINE SERVICES

- Cathodic protection installations
- Manual and Robotic internal and external field weld repairs (200 NB to 3000 NB)
- Pressure testing of pipelines up to 300 bar
- Onsite pipe bending up to 1200 NB
- Pigging stations with “smart pigs”

# Civils for Pipeline Construction

*Mocke Pipeline Construction performs civil services related to pipeline construction.*

## CIVIL SERVICES INCLUDE

- Bush clearing
- Excavation and trenching
- Bedding, compaction and backfilling
- Road, railway and wetland crossings
- Site rehabilitation
- Pipe jacking
- Horizontal Directional Drilling (HDD)
- Pipe marking
- Scour valve and air valve chambers
- Anchor, foundations, plinths and supports









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# Sure-Line® Pipelining Solutions

*Mocke Pipeline Construction relines existing pipelines with a HDPE liner to extend the life of the pipeline at a fraction of the cost.*

Mocke is the exclusive global license holder from Polymeric Pipe Technologies (USA) for the Sure-Line process technology.

Mocke uses the Sure-Line trenchless lining technology that enables an existing pipeline (in any material) to be lined with a HDPE liner to extend the life of the existing pipeline. Standard HDPE is folded into a “C” shape and pulled through the existing pipeline.

Rehabilitation rather than replacement of an existing steel bitumen, rubber lined, concrete, fibreglass or PVC pipelines can save significant costs.

The corrosion and wear resistant HDPE liner will significantly extend the life of the pipeline for applications in slurry, mining tailings, oil and gas, sewer and bulk water supply.

Sure-Line is quick to install in continuous lengths usually in excess of 1000m into the host pipe above or below ground.

## ADVANTAGES OF SURE-LINE

- Rehabilitation of pipelines from 200 mm to 1200 mm diameter
- Save on costs of a new pipeline
- Save on costs of excavating existing pipeline
- Limited downtime of existing pipeline in order to line
- Continuous length savings on cost of steel flanges
- Rapid installation on site
- Leak free
- Corrosion resistant
- Less flow friction with HDPE

## ACHIEVEMENTS OF SURE-LINE

- Longest mine tailings pipeline – 52 km
- Largest mine tailings pipeline – 850 NB
- Longest single pull – 2195 m
- Highest vertical pull – 366 m

# THE SURE-LINE PROCESS

The existing pipe is camera inspected and if required the pipeline is cleaned using an air powered pig and the debris is removed.



HDPE liners are delivered to site and are butt welded together into a continuous length as required.

The liner pipe is pulled through a tucking device which forms the HDPE liner into a “C-Shape” and then taped into position.



The formed and taped HDPE liner is pulled through the host pipe by means of a winch.

The termination ends are stub welded and flanged to allow connection with the rest of the pipeline.



Air pressure is applied inside the HDPE liner in order to snap the tape and return the HDPE to its original shape with the correct tight fit inside the pipe.

## DESIGN CONSIDERATIONS

- The thickness of the HDPE liner has a SDR value between 30 and 40 for sufficient weld thickness and being able to fold
- High pressures in pipelines are supported by the host pipe and not the liner
- After lining, the HDPE liner fits securely against the annulus of the host pipe with a size for size interference fit
- Continuous lengths of more than 1000 m can be achieved in one pull

# Plants and Mechanical Systems

*Mocke Pipeline Construction provides a complete fluid conveyance solution for the construction of plants and mechanical piping systems for the mining, oil, gas, water, sewer, agriculture and chemical industries.*

*Systems include piping, valves, pumps, electrical and instrumentation.*

## MOCKE PLANT CAPABILITY

- Tailings Storage Facilities (TSF)
- Mining CIL and floatation plants
- Mine dewatering plants
- Pickling plants
- Desalination plants
- Pontoons / barge systems
- Chemical plants
- Pump stations
- Water treatment works
- Irrigation feed systems
- Oil and gas plants
- Reverse osmosis plants

**Oil and Gas Plants**

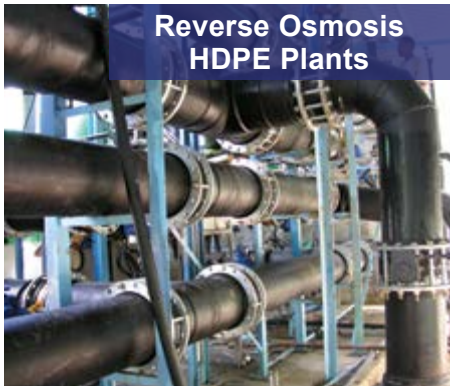
**Valve Stations**

**Desalination Plants**

**Pontoons and Barges**

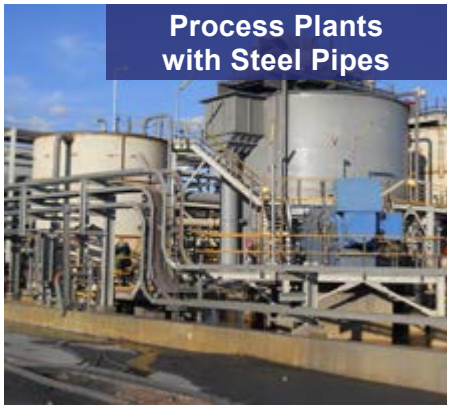

Mine Dewatering Plants

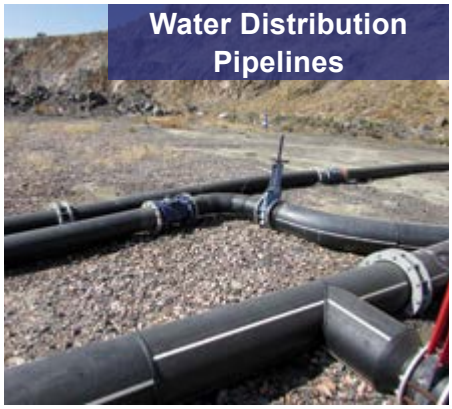

Chemical Plants


Reverse Osmosis HDPE Plants


Slurry and Tailings Systems


Mechanical Installations


Process Plants with Steel Pipes


Water Distribution Pipelines


PumpStations

# Tanks and Reservoir Construction

*Mocke Pipeline Construction constructs and installs conventional tanks and modular tanks for the mining, water, waste water, gas and chemical industries.*

## TANK SELECTION

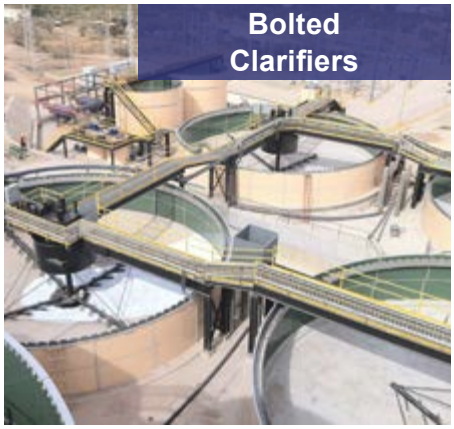
Mocke can construct tanks in a variety of materials, configurations and linings as per the requirement of the application. Including walkways, ladders, platforms, connections, access manholes, piping and level indicators.

| Tank | Lining | | | | | |
|---|---|---|---|---|---|---|
| | Rubber | Expoxy Coated | Galvanized | Unlined | Glass Fused | Polymer |
| Bolted Modular | Mining Chemical | Reservoirs, Bulk water, Raw water, Clarifiers | Borehole storage, Fire hydrant, Bulk storage | - | Carbon-in-Leach (CIL) Reservoirs Bulk water, Clarifiers, Raw, Waste water Digesters, | Aggressive chemicals and solvents |
| Steel Welded | Mining Carbon-in-Leach (CIL) Chemical | Mining water, Raw, Waste water, Clarifiers, Bulk water | Borehole storage, Fire hydrant, Bulk storage | - | - | Aggressive chemicals and solvents |
| Plastic | - | - | - | Chemical | - | - |

Bolted Modular tanks are installed on site with fewer people and less equipment when compared to conventional concrete or welded tank installations saving significant construction cost and installation time.

Bolted Modular tanks are erected using pre-manufactured glass fused steel plates that are bolted together on site, giving a long life solution.

Bolted Modular tanks are available up to 50 000 $m^3$ in size, with each tank designed according to the unique operating conditions.



Bolted Clarifiers

## DESIGN AND INSTALLATION

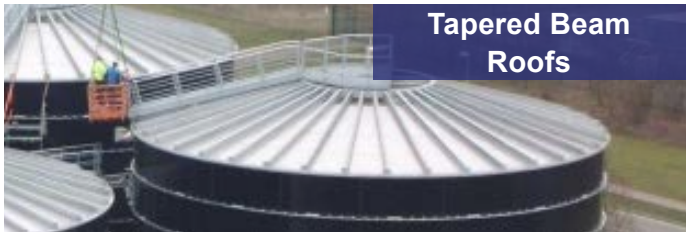
Bolted Modular tanks are available in various roof designs including flat, tapered or geodesic designs. Bolted Modular tanks can include pipes, fittings and pumps with all ancillary equipment where required. Tanks are installed onsite on standard foundations using a sealed bolt-up system.

**Glass Fused Floor Panels**

**Bolted Installations**

**CIL Process Tanks**

**Tapered Beam Roofs**



**Trough Deck Roofs**

**Geodesic Dome Roofs**

## TECHNOLOGY

The Bolted Modular tank plates are coated using a Glass-fused-to-Steel system to provide an exceptionally hard wearing and chemically resistant coating. The inert silica infused process will not chip or peel off giving the strength of steel and a stabilized finish.

Panels are manufactured under strict EN ISO standards and then installed by Mocke on site according to clear procedures onto a prepared concrete foundation.

# Quality & Engineering Solutions

*Mocke Pipeline Construction believes that the quality of a pipeline is a result of the durability of the pipeline and intergrity of the workmanship and quality assurance equipment.*

Mocke ensures quality assurances along each step; from design of the supply chain process to installation in order to provide an accountable pipeline solution with integrity.

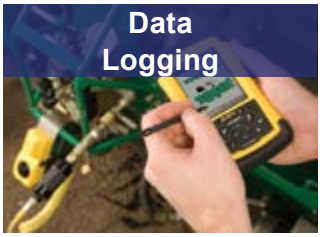
Mocke offers responsible design, installation and rehabilitation solutions through advance procedures, equipment and techniques to provide the client or design companies a pipeline that lasts the design lifecycle.

## STEEL PIPELINES

- Quality supply from steel pipe mill
- Internal line-up clamp technology
- Auto / semi-auto welding techniques
- Ultrasonic weld testing
- On-site pipe bending
- Robotic field weld coating

## HDPE PIPELINES

- Quality control on pipe extrusion fabrication
- Automated butt fusion process
- On site tensile testing of welds
- Electronic data capture
- Internal bead removal


## OTHER REHABILITATION OPTIONS

Other alternative coating and rehabilitation systems can be considered where required in order to increase the pipeline life.

These can include:

- Sliplining – Insertion of a HDPE or steel pipe into the host pipe with allowances for sliding and couplings
- CIPP (Cured In Place Pipe) – An inflatable sleeve inserted into the pipeline and cured in place
- Application of corrosion inhibiting coatings to the inside and outside of the pipe

## STEEL LINED SPOOL SECTIONS

Mocke can produce flanged spool sections lined with various polymer / plastic linings as part of a site construction ability.

- Materials of construction can be in HDPE, PP, PTFE and PEX
- Available in 6, 9, 12m lengths, or other lengths
- Mocke can supply flared or machined stub flange ends or coupling stub ends in pressures in excess of 250 bar

# Pipeline Services

*Mocke Pipeline Construction offers a range of pipeline services and advice to EPCM companies to ensure that the best pipeline solution is considered. We offer a comprehensive solution from pre-feasibility, design, engineering, procurement, construction, commissioning and maintenance.*

Mocke utilises decades of experience and references in pipeline construction, with the related speciliased design partners, to assist clients, engineering companies and main contractors, to tailor-design the pipeline to the correct specifications, best practical construction solutions and the best design for the specific solution.

## DESIGN SERVICES

- Pipeline assessments and reports
- Flow optimization and performance
- Trouble shooting of pipeline problems
- Solution providing for pipeline rehabilitation

**Camera Inspections**

## HOW CAN WE HELP?

- Advise best material specification for the application
- Propose design for ease of construction
- Consider alternative construction methods

## PIPE ASSESSMENT & TROUBLE SHOOTING

- Emergency pipe failure repair options
- Camera inspection (CCTV)
- Internal robotic epoxy coating assessment
- Thickness testing of steel pipes
- Performance trouble shooting and optimization
- Pigging assessments
- Smart Pigs
- Pressure testing
- Leak detection



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