Applus

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PIPELINE INSPECTION & REHABILITATION

Pipeline Inspection, Condition Assesment & Rehabilitation Solutions

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OUR SERVICES INCLUDE

Condition Assessment

- CCTV Inspection
- Deflection Measurements
- Trunk Sewer and Storm Pipeline Cleaning
- Blockage Removal
- Robotic Cutting
- Manhole Inspections
- GPR Survey
- Intelligent Pigging of Pressure Pipeline
- Inline Leak detection
- Above Ground leak detection by using Acoustic and Noise Correlators
- Leakage prediction solutions – Level Sensor
- Joint Testing

Trenchless Pipe Rehabilitations

- CIPP UV Lining
- GRP Slip Lining
- GRP Spot Repair
  - Quick Lock
  - Internal Mechanical Pipe Seals
  - Smart Lock
- Flow & Pressure Monitoring Pressure Pipelines
- Sewer Flow Monitoring·
- Sewer Salinity Monitoring

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Gravity Pipe Inspection & Deflection Measurements

Surface Ground Water and Wastewater Sewer Network

Applus+ CCTV Pipeline Condition Assessment

Applus+ has a number of camera systems which range from 80mm to1600 mm pipe dimeters. With the help of continuous, laser-based profile analysis and deformation measurement, consequential damage caused by pipe or sewer deformations in circular and ovoid profiles can be detected at an early stage and thus be avoided or economically repaired.

CCTV surveys determine the condition of the inside of the pipe, we also offer the following:

- Pipe Deflection (Ovality)
- Internal Pipe measurements
- Lateral Pipe measurements
- Tilt Surveys.
- Joint Gap Measurements

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Benefits

Identify structural and serviceability problems in sewers, drains and culverts before considering any repair or remedial solution.

Structural Issues

- Open or displaced joints
- Cracks
- Fractures
- Breaks
- Deformations
- Collapses

Service Issues

- Build-up of scale
- Encrustation
- Debris
- Obstruction

All reports are coded to EN 13508 standards by our WRC Certified Coders

Applus+ Trunk Sewer and Storm Pipeline Cleaning

Various range of pipe Diameters

Applus+ cleaning trucks are a combined high-pressure water jetter with vacuum. The jetter will remove all debris including sand, silt, roots, scale and grease from inside the pipelines. The vacuum will lift all these debris from the manholes into the waste tank. Adjustable water pressures and cleaning nozzles can be used that will be suitable for all pipes.

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Applus+ Robotic Cutting

Applus+ has several robots specifically designed for rehabilitation work inside sewers of various pipe diameters. These versatile robots are equipped with different tool attachments, allowing them to perform milling, grinding, filling, and injection operations.

The robots are primarily used to address common sewer issues such as misplaced pipe connections, root intrusion, encrustations, concrete blockages, and deposits. Additionally, they are highly effective in opening laterals after CIPP (Cured-In-Place Pipe) and patch repairs. With their precision and flexibility, these robots ensure that repairs are completed efficiently, minimizing disruption to the sewer system and reducing the need for costly excavations. This technology helps maintain the long-term integrity of the infrastructure.

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Manhole Inspection

Manholes provide critical access to underground sewer systems for maintenance and inspection. Applus+ uses advanced camera technology for manhole inspections, capturing high-quality footage to document their condition.

This technology allows remote assessments of the manhole's structural integrity without confined space entry. By reviewing real-time footage, Applus+ can quickly detect issues such as cracks, leaks, or blockages. Early detection is vital to prevent more extensive damage and costly repairs.

The detailed documentation from these inspections gives clients a clear view of the manhole's current state, helping them make informed decisions about maintenance or repairs. Applus+ ensures that any damage is identified and repaired promptly, supporting the long-term functionality of the sewer system.

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Ground Penetrating Radar (GPR)

Ground penetrating radar – a geophysical method that operates by transmitting electromagnetic waves from an antenna and reflects off layers and objects hidden in the ground.

These reflections are collected as data which generates a picture of the subsurface. A GPR system is an efficient tool and commonly used when digging, coring, or drilling is not allowed, or needs to be reduced to minimize cost.

Range of ground penetrating radar solutions covers the applications of multiple geological applications as well as applications for mapping utilities and other subsurface objects and internal structures of constructions.

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Intelligent Pigging Tool for full internal condition assessment

The Intelligent Pigging Tool assesses the internal condition of pressure pipelines with diameters ⩾ DN150. The tool is suitable for use all materials including concrete, asbestos cement, cast iron, stainless steel, HDPE, PVC, GRP/GRE

What Parameters are included:
The Applus+ tool provides a comprehensive condition assessment by measurement of the following parameters with high accuracy:

- Wall thickness degradation
- XYZ Location
- Corrosion
- Leak Detection
- Leaching
- Deformation
- Deterioration due to H2S.
- Angular displacement of joints
- Joint gap width

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Pressurised Pipe Inspection

Potable Water, Sewer Force Irrigation and Fire Networks

Applus+ Inline Acoustic Leak Detection Tool

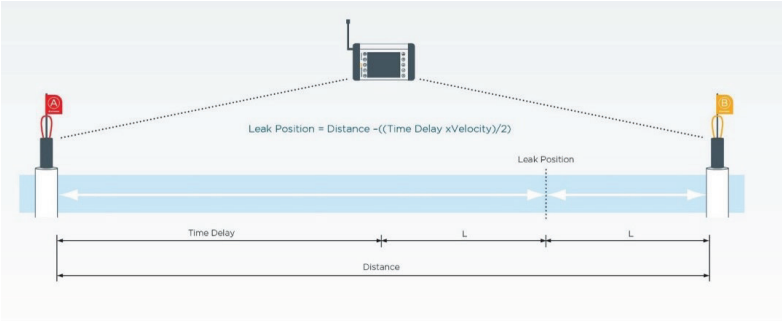
Diameter Range 150mm to 1000mm
Minimum flow rate - 0.3m/s
Minimum pressure - 4 Bar

The inline acoustic leak detection system incorporates the latest in hydrophone technology to accurately identify and record leakage points in pressurised pipe network in all materials at even low pressures.

- Launched from any 2" fitting
- Range 2km
- Pressure rated to 16 bar
- Accurate location of leakage points due to tethered technology

Applus+ Noise Correlator and Ground Microphone for Leak Detection

Applus+ offers advanced leak detection services using the Noise Correlator and Ground Microphone, high-performance tools designed to locate leaks in water mains, water services, and residential or commercial properties. The system's acoustic microphone amplifies the mechanical vibrations caused by water escaping from a pressurized pipe, enabling precise detection of even the smallest leaks.



This technology allows Applus+ to efficiently identify hidden leaks, minimizing water loss and preventing costly damage. By providing accurate, non-invasive leak detection, Applus+ helps clients maintain the integrity of their water systems, ensuring

Applus+ Leakage Prediction Solutions- Level Sensor

Applus+ delivers cutting-edge environmental monitoring services for wastewater, flooding, highways, and other critical areas using innovative water level sensors. With a range of 14 meters or more and simple installation, these sensors are perfect for sewer systems and various applications. Applus+ ensures accurate monitoring and timely data to support effective infrastructure management.

Our sensors enhance operational efficiency and help mitigate risks associated with flooding and wastewater overflow, contributing to sustainability efforts. By leveraging real-time data, Applus+ empowers clients to respond swiftly to environmental changes, optimizing resource allocation and enhancing safety.

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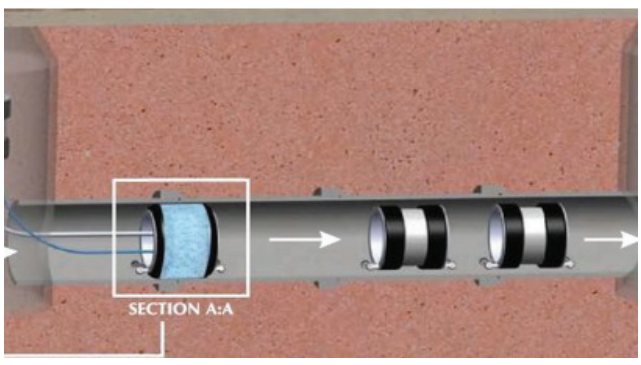
Pipe Joint Testing

Applus+ offers comprehensive joint testing services using advanced joint tester technology to ensure the integrity of piping connections. With our expertise in non-destructive testing, we can accurately assess the condition of pipe joints, detecting potential leaks or weaknesses early on.

Our joint tester plugs are designed to reduce water consumption and shorten testing times, making the process more efficient and environmentally friendly. This allows Applus+ to minimize the environmental impact while ensuring accurate results. Our team of skilled technicians can deploy this technology to provide reliable testing services, reducing downtime and preventing costly future repairs.

By leveraging our advanced tools and industry expertise, Applus+ helps clients maintain the long-term integrity of their piping systems, contributing to both operational efficiency and sustainability.



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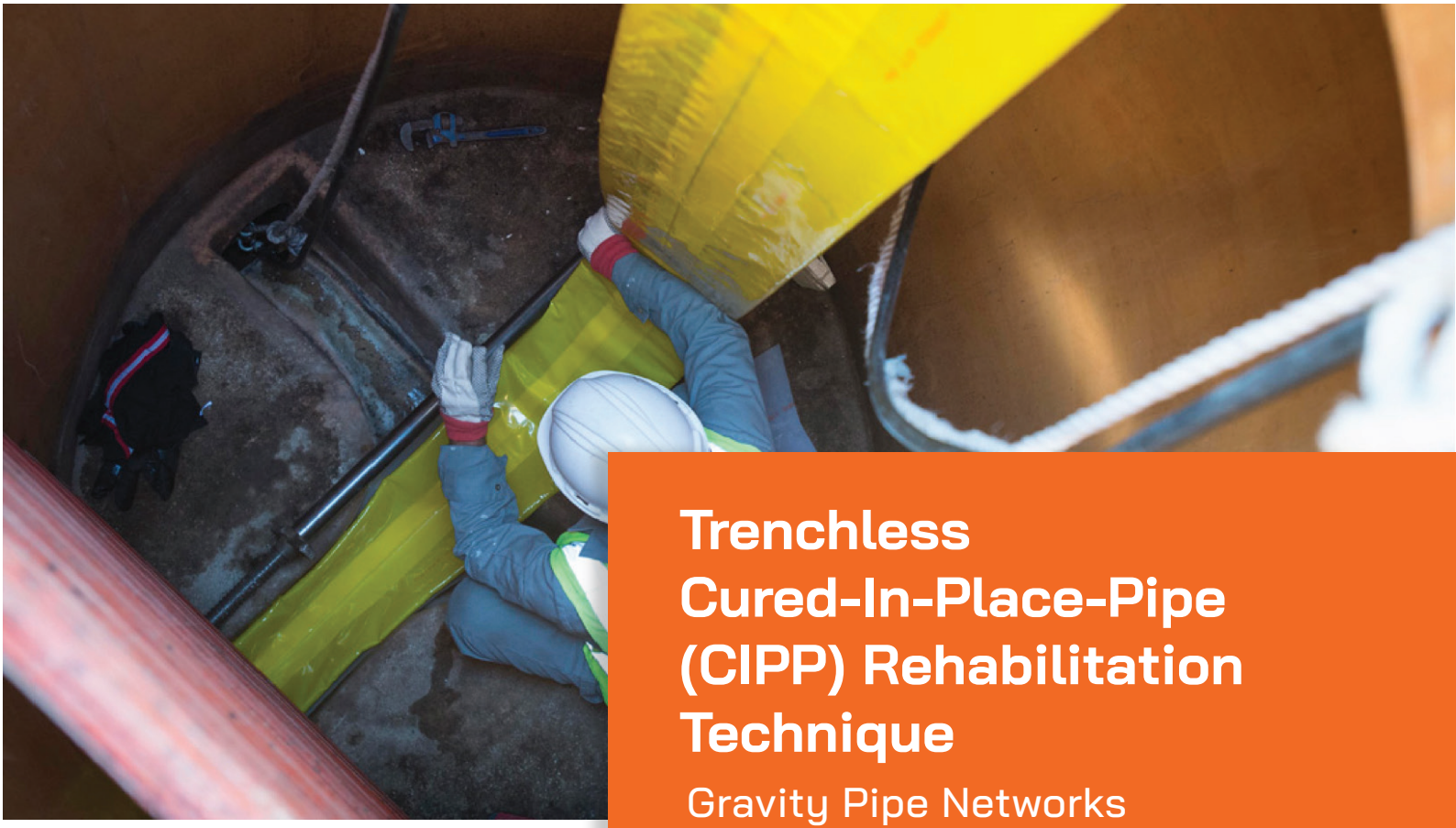

Trenchless Cured-In-Place-Pipe (CIPP) Rehabilitation Technique

Gravity Pipe Networks

A cured-in-place pipe (CIPP) is one of several trenchless rehabilitation methods used to repair existing pipelines. CIPP is a jointless, seamless, pipe-within-a-pipe with the capability to rehabilitate pipes ranging in diameter from DN100 to DN1600.The process is carried out through the manholes, avoiding excavation and traffic congestion.

There are several different materials and methods of curing, Applus+ are lining with glass Reinforced liners which are cured using UV technology. The majority of pipes being rehabilitated using CIPP are sewer and drainage, these lines will have internal failings and infiltration problems. Once lined these pipes will be good for another 50 years.

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Slip Lining Rehabilitation Technique

Pressure Pipe Networks

Applus+ using unique features of the system for trenchless rehabilitation offers numerous benefits in comparison with conventional pipe rehabilitation and other trenchless solu- tions. Its flexibility opens a variety of possible applications. Material offers, bendable, light and easy to transport with the material strength of the steel pipe. The liner achieves its features with its unique, three-layered composition of polyethylene (PE), an aramid fabric reinforcement and – for particularly demanding applications – thermoplastic polyurethane (TPU).

Installation in pressure pipelines with bends of up to 45 degrees Assembly with little space requirements, for instance in difficult to access environments or densely developed city setting-

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Trenchless Spot Repair Techniques

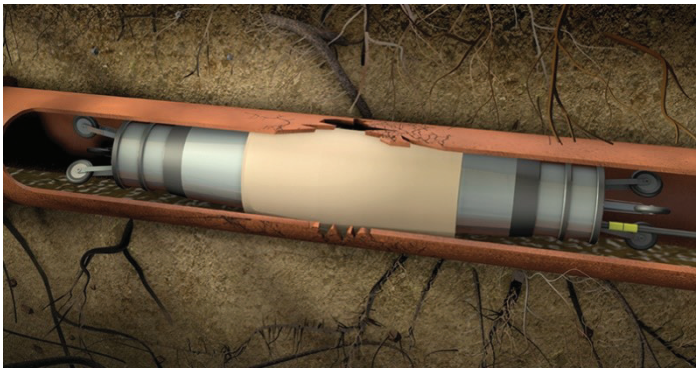
Gravity Pipe Networks

GRP Sectional Repair

The patch repair system provides a localized repair within an existing pipeline. It is quick to install and offers little disruption to property, services and traffic. The patch is installed through the manhole avoiding any excavation and replacement costs.

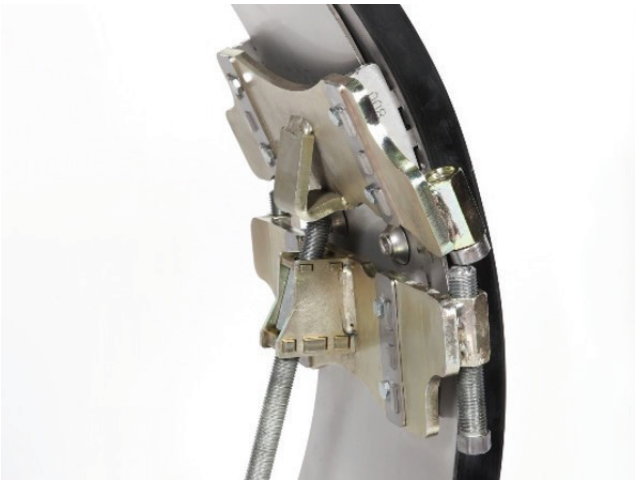
The Applus+ Trenchless CIPP GRP Sectional Repair Technique smooths displaced joints and can seal cracks and holes. It also reduces the resistance caused by such defects, the net effect being increased flow of solids and liquids, preventing future blockages.

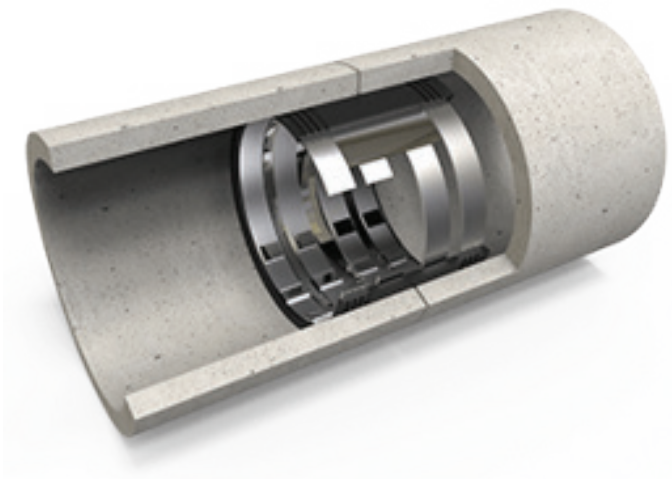
- Full structural repair bonding to existing pipe even in wet conditions
- Suitable host pipe materials include VC, GRP, GRE, concrete and cast iron
- Highly resistant to chemicals and abrasion



Quick Lock

The Quick-Lock system is much more than just a repair procedure. The patented Quick-Lock-System based on compression and the durable materials V4A stainless steel and EPDM has proven itself in the renovation of pipes over many years. In addition to the classic application as a repair method in sewer rehabilitation, the Quick-Lock system is also used for connecting pipe liner systems and for rehabilitating walkable sewers.





Internal Mechanical Seals

Internal pipe seals have been used worldwide for trenchless rehabilitation of pipes and sewers for industrial water, drinking water, wastewater, fuel and gas. WRAS approved material, comply fully with BS6920 and have a typical life expectancy of50+ years. The rubber sleeve is then held in place by stainless steel retaining bands allowing up to 20 bar of internal or up to 2.0 bar of external pressure.

The Applus+ Trenchless Mechanical Joint Seal Repair made of durable materials, V4A stainless steel and EDPM rubber and is suitable for all pipe materials, including PVC and HDPE.

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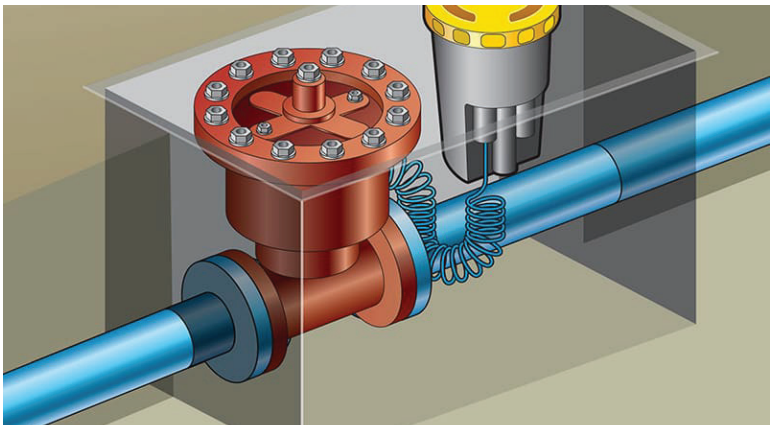
Flow and Pressure Monitoring

Pressure Pipelines

Pressure Monitoring

The Pressure log data which is generally required by utility companies is acquired from 7/14 days pressure reading at 15 minutes logging frequency to cover the peak and lowest pressure readings.



Pipe type: All

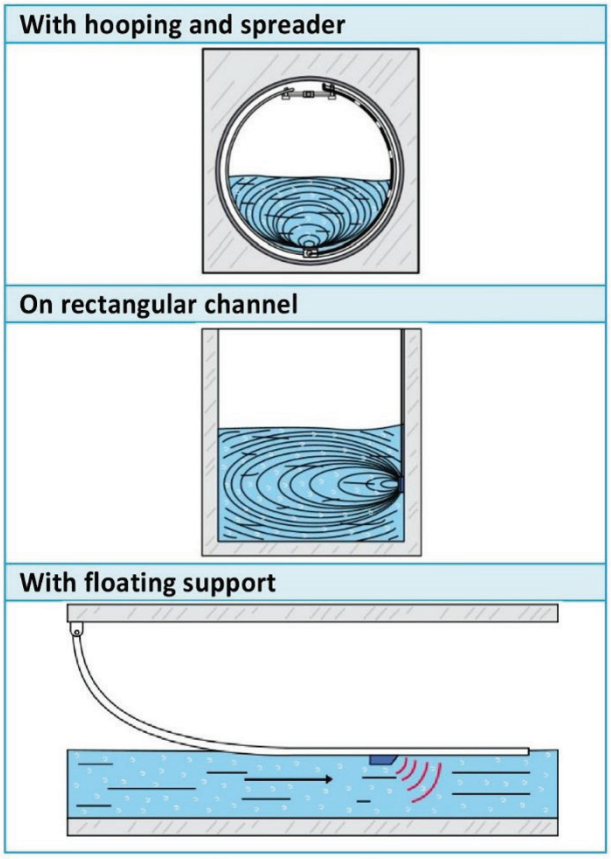
- Applicable mediums: All
- Max. internal pressure: 20 bar
- Accuracy ±0.1% (of full scale)

Flow Monitoring

Applus+ using latest generation of portable clamp-on flow meters.

- Pipe sizes: Standard: 0.5 to 24 in. (15 to 600 mm).
- Pipe Wall thickness: Up to 3 in. (76.2 mm).
- Pipe Material: All metals and most plastics.
- Accuracy: ±1% of reading (2 in./50 mm or greater pipe sizes).
- Accuracy: ±2% of reading (0.5 in./15 mm ton<2in./50 mm pipe sizes)

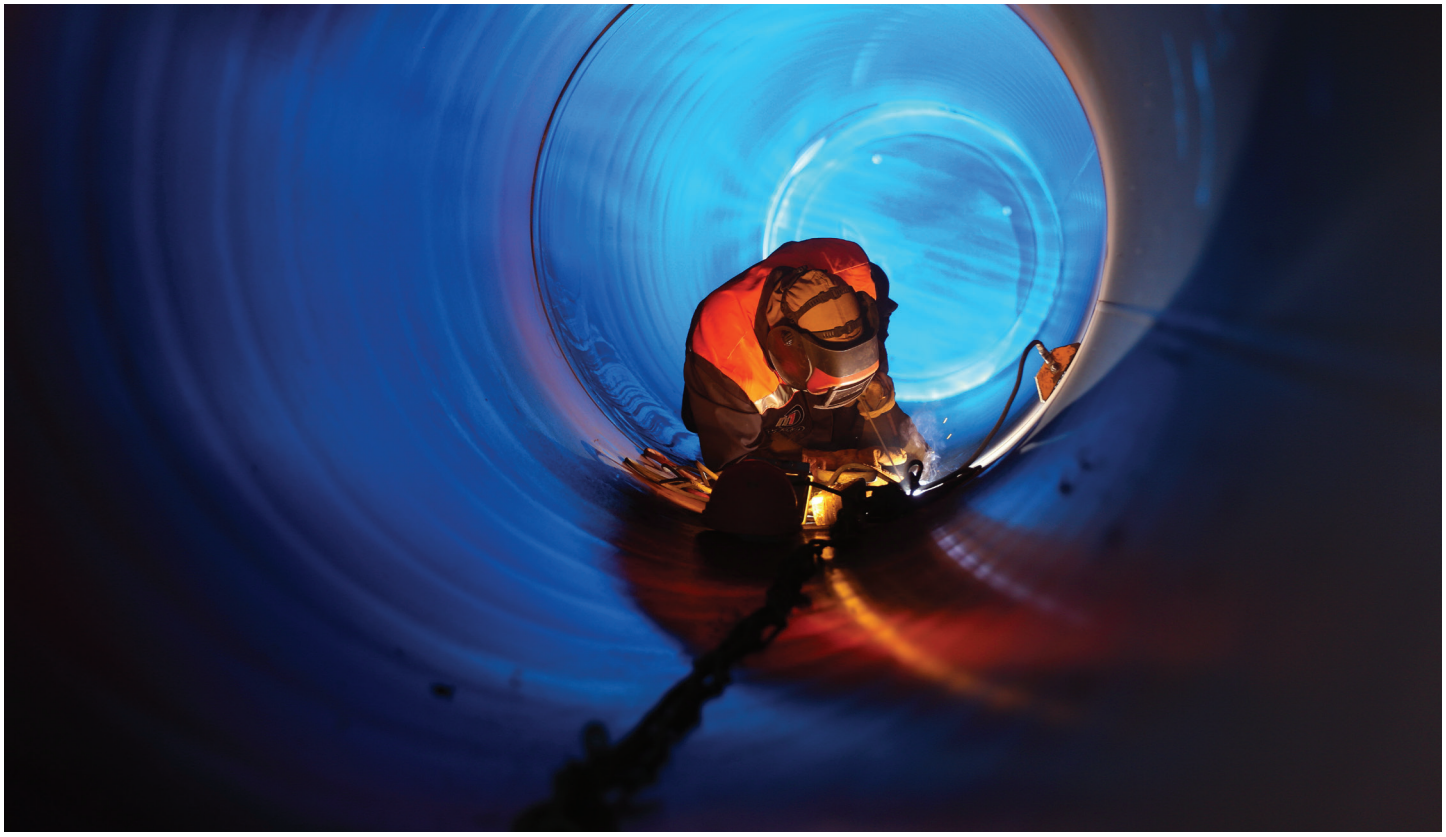
Various installations



Sewer Flow Monitoring

Applus+ has various types of flowmeter to measures and records flow for open channels and part filles pipes. The Open Channel flow meter is used either in portable configuration, for survey and diagnostic work, for precise flow data in sewer networks, or in fixed configuration, for regulatory work and overflow survey.

- Operating Temperature: -20to 60°C
- Accuracy: ±2% of reading if V⩽ 0.5 m/s
- Accuracy: ±0.01% m/s (±0.023 ft/s) V<0.5m/s
- Units: m/s or ft/s



As a **Global leader**, we have the technology, human capabilities and resources to meet the demands of industry. No matter the size, scale or scope of the work, we always go beyond standards by delivering operational excellence with local knowledge and global competence.

We are dynamic organisation; problem-solvers by nature. Where there is no existing answer to a challenge or problem, we will use our vast experience and in-depth knowledge to find one. By working closely with our clients, we have become a**Trusted partner** who delivers new, innovative solutions with highest of integrity.

A **Passion for improvement** drives our teams to safeguard client operations while delivering our services. We innovate to bring about advances in operational safety and this commitment to excellence is what makes us renowned as one of the best.

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