

Brawoliner®

24/7 Ordering at
ApexCIPP.com



THE SPECIALIST FOR NO DIG REHABILITATION

from DN 50 to DN 400 - 2" to 16"

- Private and public drainage
- Housing management
- Industry



STEAM
LIGHT
HOT WATER
AMBIENT TEMPERATURE

BRAWO® SYSTEMS

APEXCIPP.COM

HIGH DEMAND FOR PIPE REHABILITATION

The total length of drainage systems on private and industrial properties is far greater than the public sewer system. Studies in various regions recorded a leakage of 50 to 70 percent. One fifth of the tested pipes should be rehabilitated in the short to medium term to avoid more serious damage in the future. There is so much to do – let's go for it.

The Problems

Exfiltration:

Through defective pipes wastewater can enter into the ground. The discharge of pollutants into the ground is illegal and contamination of soil and groundwater must be avoided.

Infiltration:

If clean groundwater and rainwater enters faulty sewage pipes, it must be cleaned at the treatment plant and this leads to a significant increase in sewage charges.

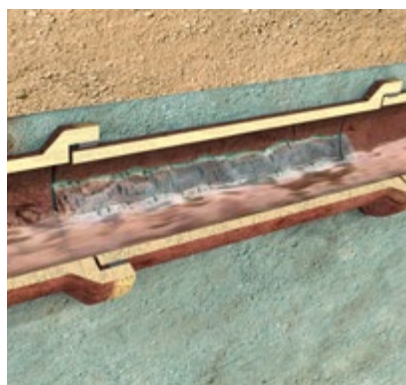
Value of the property

Leaking pipes can cause a wet basement, a blockage or even a collapse of the pipes during heavy rainfall. If the damage is detected in time, it can be easily removed and expensive consequential damage can be avoided.

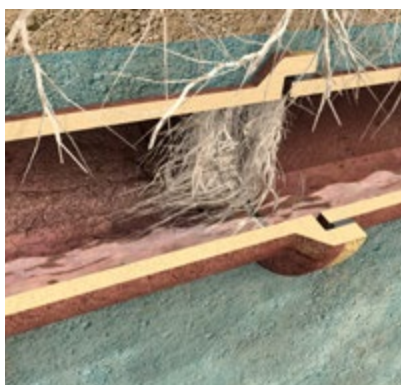
With the proven BRAWOLINER® system, the rehabilitation measures can be carried out quickly, permanently and cost-effectively.



Even small leaks can cause major damage over time. A camera inspection can detect the damage at an early stage, so it can be eliminated cost-effectively.



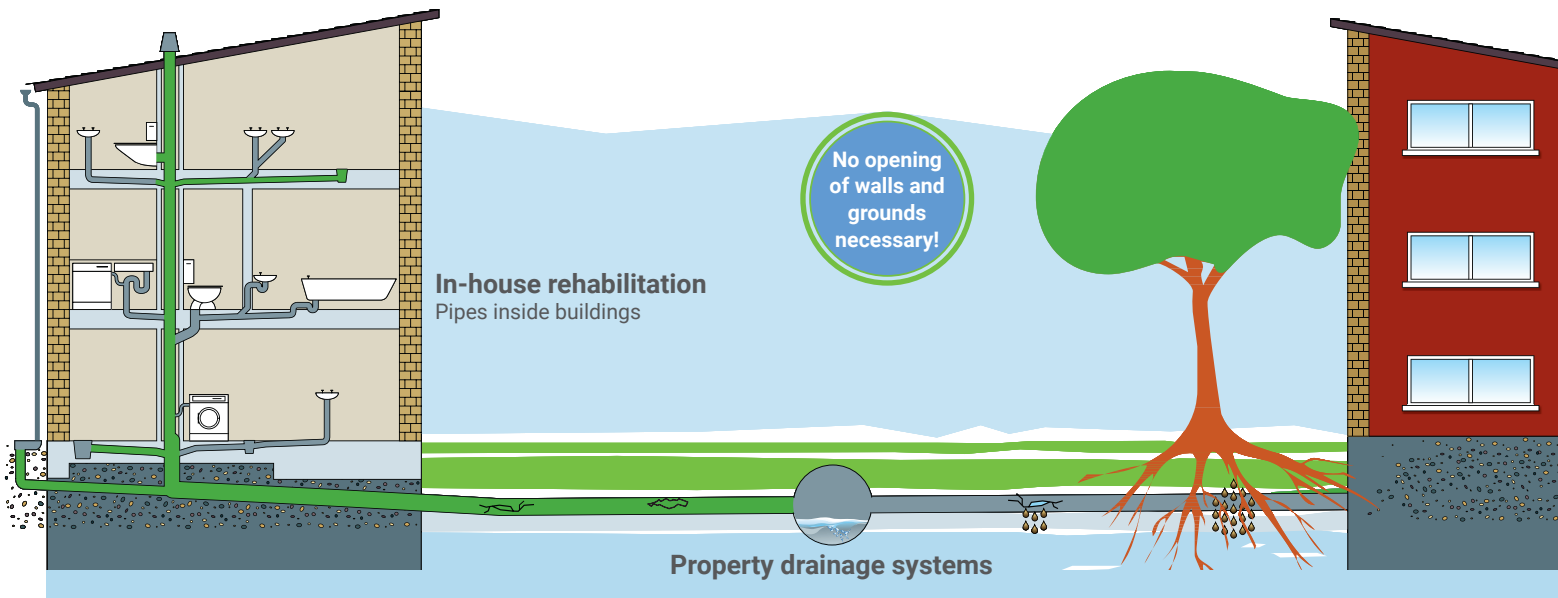
Longitudinal crack



Roots



Displacement



RENOVATE PIPES EFFECTIVELY - WITH NO NEED TO EXCAVATE

Fast, cost-efficient and durably leak-free

BRAWO® SYSTEMS offers an all-round solution for the efficient renovation of **underground pipes** and **vertical pipes inside buildings**.

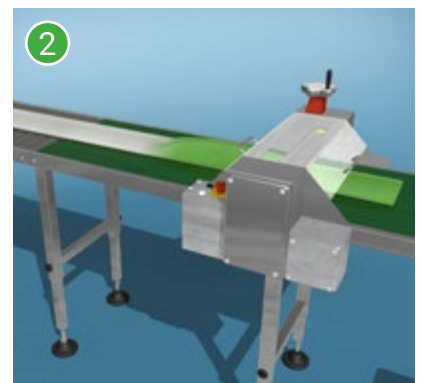
No need to excavate the pipes concerned. Saves both time and money during renovation.

During the renovation process, the flexible BRAWOLINER® is soaked in resin and then inserted into the defective pipe using pressurised air or water. The BRAWOLINER® completely lines the inside of the pipe and eliminates any existing or potential damage.

Curing creates a completely new, watertight pipe within the old one.



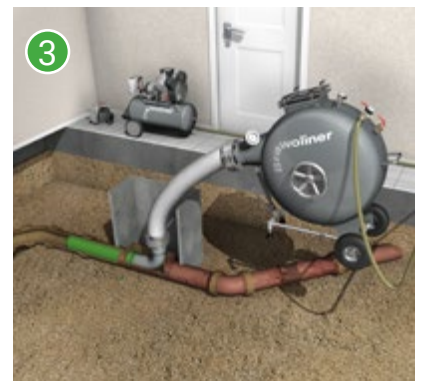
Mixing of resin and hardener



Impregnation of the liner



Result after curing: a new pipe in the old pipe



Inversion with a pressure drum



BRAWOLINER® - rehabilitation during production

ADVANTAGES OF THE BRAWOLINER® - REHABILITATION

The BRAWOLINER® - process was developed specifically for the rehabilitation of pipes in diameters from DN 50 to 400 and offers many advantages compared to traditional remediation:

- **Rapid rehabilitation** without excavation, dirt and noise
- Up to **50% cheaper** than open construction
- Suitable for almost **all damage** and **all pipematerials**
- Durability of **over 50 years**



BRAWOLINER® - One liner for all four Curing Methods

BRAWO® SYSTEMS guarantees its customers maximum flexibility on the often difficult to plan construction sites in buildings and property drainage. No matter if light, water, steam or ambient temperature - no different liners have to be kept available.



- **Cold curing**
Buried pipes and In-house
- **Hot water curing**
Buried pipes (up to 4m height difference)
- **Steam curing**
Buried pipes and In-house
- **Curing with UV or LED-light**
Buried pipes (shrinkage)

THE COMPLETE SYSTEM FOR YOUR SUCCESS



BRAWOLINER®

The Liner for domestic sewer renovation

- ➔ Completely seamless liner
- ➔ For small diameter sewer rehabilitation
- ➔ Up to two dimensional changes
- ➔ Bends of up to 90°
- ➔ From DN 50 to DN 400
- ➔ Optimum adaptation to the pipe



BRAWOLINER® Connection collars and cap collars

Tight fitting, flexible collars

- ➔ Flexible BRAWOLINER® material
- ➔ Optimal adjustment to the pipe run after the connecting piece
- ➔ Capable of lining bends
- ➔ Change of dimension possible



BRAWO® resins

The epoxy resins for lasting quality

- ➔ Epoxy resins with different curing times
- ➔ Excellent static properties
- ➔ High abrasion resistance
- ➔ High chemical resistance
- ➔ Certified environmental performance

Special vinyl ester resin for light curing

- ➔ Styrene-free
- ➔ Curing with our light curing systems (UV or LED-light)

Complicated pipe runs? - No problem with BRAWOLINER®
The rehabilitation solution for pipes from DN 50 to DN 400



Multiple bends of up to 90°



Two changes in pipe diameter are possible



Fast, easy and affordable renovation of pipe unions

BRAWO® SYSTEMS - competence in more than 30 countries!

BRAWO® SYSTEMS is a leading systems supplier in no dig rehabilitation. Besides as liners and resin, we also offer the complete installation equipment. Specializing in small diameter pipes from DN 50 to DN 400, we offer a reliable rehabilitation solution for sewerage systems with 90° bends, changes in diameters and for defective pipe connections.

Outstanding service, fast delivery, expert advice and support for projects, as well as an unique quality at fair prices is what we stand for in over 30 countries.

Convince yourselves of our innovative renovation solutions.



APEXCIPP.COM

BRAWO[®] SYSTEMS

THE REHABILITATION EXPERT FOR PROPERTY AND
BUILDING DRAINAGE SYSTEMS

PRODUCT CATALOG

LINERS
RESINS



BRAWOLINER® - A Quality Product ...

Brawoliner®

Up to
two changes
in dimension

- Without excavation and chiselling work
- Suitable for nearly all damage profiles and pipe materials
- Much shorter rehabilitation times
- Rooms remain habitable during rehabilitation
- Environmentally friendly, sustainable and permanent
- Up to 50 % cheaper than open construction method

Extremely
flexible and
strong

Curing with
UV- & LED-light

For bends
of up to 90°

BRAWOLINER® fulfills quality standards, e.g.:

- Material examination of BRAWO® I in accordance to ASTM F 1216
- Material examination of BRAWO® III in accordance to ASTM F 1216
- BRAWOLINER® compliance tests according to DIN EN ISO 11296-4

All US partners are trained in the installation of BRAWOLINER®.

... With Highly-Qualified Partners!

Furthermore distinguished partners got the BRAWO® SYSTEMS CENTER certification for outstanding service in the US:

- Training center and training system according BRAWO® Academy standards
- On site support with trained technicians
- Stock with BRAWO® SYSTEMS products for direct delivery
- Product marketing with original Brands BRAWOLINER®, BRAWO® Tech
- Repair service for machines and equipment



BRAWO® SYSTEMS Range of Products

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BRAWO® Resins

BRAWO® Epoxy Resins

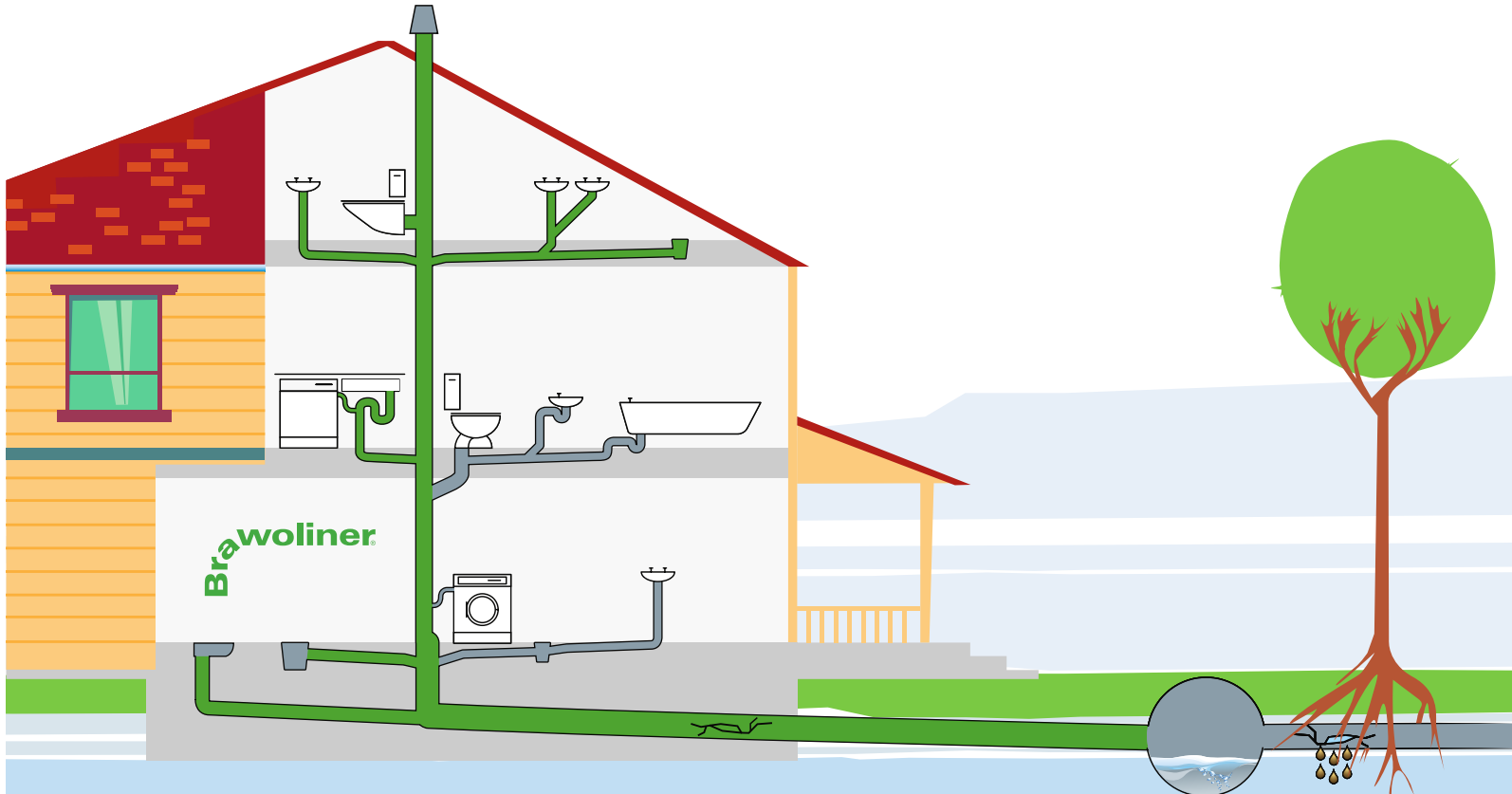
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One Liner for all 4 Curing Methods 10-11



BRAWOLINER®

BRAWO® SYSTEMS offers a seamless textile liner for the rehabilitation of small diameter pipes. The BRAWOLINER® is extremely flexible due to the special loop construction. This makes it the ideal rehabilitation solution for defective pipes with bends of up to 90° and up to two changes in dimension. This liner offers an economic and environmentally-friendly alternative to open construction work!



BRAWOLINER®

The standard for repairing defective drains

- From 2" to 10" (DN 50 to DN 250)
- Bends of up to 90°
- One dimensional change



BRAWOLINER® XT

Rehabilitation of structurally impaired pipes

- From 4" to 10" (DN 100 to DN 250)
- Significantly higher stiffness
- Bends of up to 90°
- One dimensional change



BRAWOLINER® 3D

Liner for changing diameters

- From 3" to 4" (DN 70 to DN 100)
- From 4" to 6" (DN 100 to DN 150)
- From 6" to 8" (DN 150 to DN 225)
- From 8" to 12" (DN 200 to DN 300)
- From 12" to 16" (DN 300 to DN 400)
- Up to two changes in dimension
- Bends of up to 90°



BRAWOLINER® HT (XT, 3D)

For domestic sewer rehabilitation

- From 2" to 10" (DN 50 to DN 250)
- Bends of up to 90°
- Up to two changes in dimension
- Warm curing possible at higher temperatures with water or steam

BRAWO® Connection and Cap Collars

The rehabilitation of defective pipe connections represents a huge challenge. BRAWO® SYSTEMS supplies a tightly fitting solution for 4" to 6" main pipes and 3" to 6" branch connections.

BRAWOLINER® Connection and Cap Collars

- Flexible BRAWOLINER® material
- Optimal adjustment to the pipe run after the connecting piece
- Tight and particularly stable connection
- Ideal in combination with BRAWOLINER® rehabilitation



BRAWO® Installation Aids



Preliner

Preliners are used as an outer film between the liner and the old pipe if bonding with the old pipe is not required.

- From 4" to 12" (DN 100 to DN 300)
- Flexible film tube made of PE
- Material thickness approx. 150 µm
- Can be used for bends up to 90°

Calibration Hoses

Calibration hose is used as a support tube for installing the liner in the pipe being rehabilitated. Rehabilitation with open end is recommended where there is no possibility to open the sealed liner or if just a section of the pipe needs rehabilitation.

- From 3" to 16" (DN 80 to DN 400)
- Calibration hoses for various temperature ranges
- PVC material with PES fabric insert
- Good bend flexibility up to 45°

To make steam curing even easier and faster we offer the **AIRBAGLINER®**.

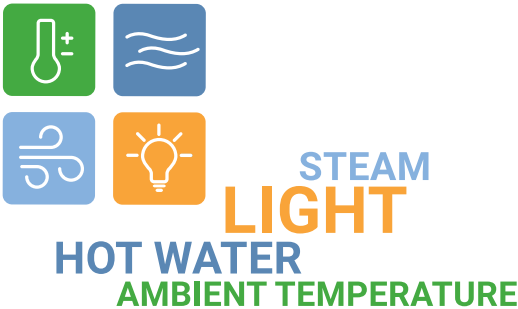


For curing with UV and LED-light!

BRAWO® Resins

The resins of BRAWO® SYSTEMS are especially developed for the rehabilitation of sewer systems. The BRAWO® epoxy resins will harden or cure at both ambient and higher temperatures. The application of heat considerably reduces the curing time. For fast curing with light, the vinyl ester resin „BRAWO® LR“ must be used. These resins have been optimized for use with the BRAWOLINER® and have outstanding properties:

- High abrasion resistance
- Solvent-free
- Excellent mechanical properties
- High chemical resistance
- Not harmful to groundwater
(Examined by the hygiene institute of the Ruhr area – institute of environmental hygiene and toxicology, Gelsenkirchen, GERMANY)



BRAWO® Epoxy Resins



BRAWO® I

- This rapidly curing resin for underground pipes is particularly suitable for the rehabilitation of shorter pipes of up to approx. 50 ft in length



BRAWO® III

- Thanks to the longer working time, the BRAWO® III is suitable for the rehabilitation of longer pipe sections or large pipe diameters



BRAWO® RR

- For particularly economic rehabilitation of pipe connections or short pipe sections



Working and curing times of BRAWO® epoxy resins

	BRAWO® I	BRAWO® III	BRAWO® RR
Working time with 59 °F	50 min.	3.5 hr	30 min.
Curing time 32 °F	13 hr	24 hr	6 hr
Curing time 122 °F	100 min.	220 min.	75 min.
Curing time 158 °F	45 min.	140 min.	not recommended

BRAWO® Vinyl Ester Resin



BRAWO® LR is a special vinyl ester resin for curing with UV and LED-light and has been optimized for use with the BRAWOLINER®.

- Light-curing in the wavelength range between 360 nm and 450 nm
- Styrene-free
- Low odor during installation
- High abrasion resistance
- Curing with a light curing system







BRAWO® LR

- For the rehabilitation of domestic sewer pipes and curing with light

BRAWOLINER® 3D

One Liner for all **4**
Curing Methods:



STEAM
LIGHT
HOT WATER
AMBIENT TEMPERATURE



Light Curing with UV and LED-light

The fast and low-cost curing with light

- Ideal for sewer pipes with few to no branches and/or inlets, e.g. connection pipes or pipes from manhole to manhole
- Connectivity of the liner at the starting and end point of the rehabilitation is necessary as no frictional connection to the old pipe is established



Light Curing (LED and UV)

Steam Curing

Curing process by steam

- Ideal for sewer pipes with large gradient differences (vertical pipes) and in-house rehabilitation
- Excellent bonding to the old pipe



Steam Curing

Hot Water Curing

Curing process by hot water

- Ideal for buried ground- and connection pipes
- Excellent bonding to the old pipe



Hot Water Curing

Cold Curing (without additional heat)

Curing process by ambient temperature

- Ideal for sewer pipes with large gradient differences (vertical pipes), in-house and for the rehabilitation of several pipes at the same time
- Excellent bonding to the old pipe



Cold Curing



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BRAWO® SYSTEMS

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