Brandenburger

Quality management

Manufacturers and rehabilitation companies share an equal obligation in the quality assurance of trenchless rehabilitation. Brandenburger operates a flawless quality management system for its pipe lining procedure. It describes quality inspections at goods reception, during the production process and during the implementation of rehabilitation measures, including construction site approval. The Brandenburger pipe lining and the UV light-hardening process developed for it both avail of the necessary approvals and quality marks.

Controlled reception of goods

Producing a pipe liner with the required quality depends on the selection of the initial materials. No short measures may accompany quality inspection as regards mechanical values, abrasion resistance and chemical stability. The short-term and long-term behaviour of these materials is after all a crucial factor in determining the quality of the new pipe created during the rehabilitation measures. High-grade UP resins are used for pipe liners in the domestic sewage range, while a special vinylester resin is used for more aggressive, industrial sewers. Similarly, only glass fibre of the highest quality is used for the glass fibre composites, endowing the final product its extremely high resistance.

Documented impregnation

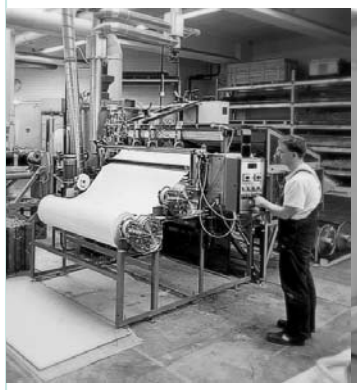
Just as important as the correct proportion of the initial materials is the standardised process – monitored step-by-step – of pipe liner impregnation with the appropriate resin. Only very careful and even impregnation combined with the security that no air is trapped in the material guarantees attainment of the required mechanical values and impermeability after curing. Brandenburger is the only pipe liner manufacturer worldwide that impregnates the initial materials (glass fibre composite) with resin before the actual production of the pipe liner. This supports an even resin impregnation and the coagulation of the resin over the entire lining length.

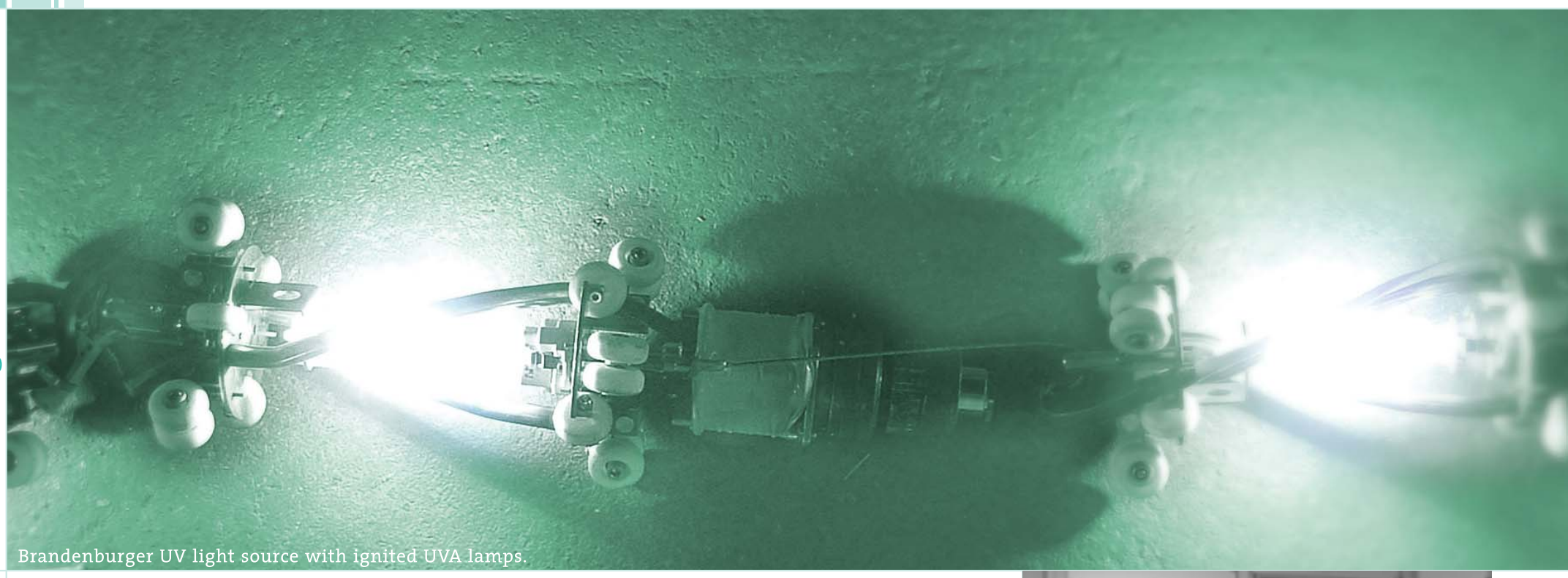
Production processes according to DIN ISO

The processes implementing production of the pipe liner have been certified at Brandenburger since 1994 according to DIN ISO 9001. The procedures and responsibilities are clearly described and ensure the carefully documented production of each individual liner. The company carrying out the rehabilitation therefore has the security of using a product that complies exactly with the requirements of the construction site situation. This ready-to-install type of production for the liner also ensures that the correct composition of the materials is documented.

At Brandenburger, the liners manufactured in this way are checked once again at the end of production for diameter, lengths and wall thickness. The liner is then packaged in UV-proof foil and can even be transported longer distances, owing to its storage capability and resistance to altering temperatures. If there are delays on the construction site, it can accordingly be stored longer.

Whether impregnating or packaging the liner. All working steps are carried out in a defined process. This minimises all sources of error.





Brandenburger UV light source with ignited UVA lamps.

Simple handling

A clear advantage of the ready-to-install production lies in the simplification of the actual rehabilitation process. Since no chemicals are required on the construction site, sources of error of this type can be completely excluded during handling. Furthermore, production is tailor-made for each installation situation, which means that no additional fitting work needs to be done.

Hence the rehabilitation company can fully concentrate on the laying and curing of the pipe liner. The final product is so to speak only completed on site, so this step plays a decisive role in quality. Brandenburger works solely in cooperation with selected, expert companies, which carry out the rehabilitation according to the manual, ranging from the pull-in procedure to curing and the appropriate control measures. Their staff attends training sessions by Brandenburger and thus acquires the necessary know-how.

Monitored curing

In contrast to the warm curing process, the Brandenburger pipe liner process based on UV light technology has the great advantage of documenting the effectiveness of the curing process every metre of the way. Once the pipe liner has been pulled into the pipe which is to be rehabilitated and set up with compressed air, the entire curing process is controlled through the UV light unit. It has TV cameras recording the curing process. All information is collected and therefore available for inspection.

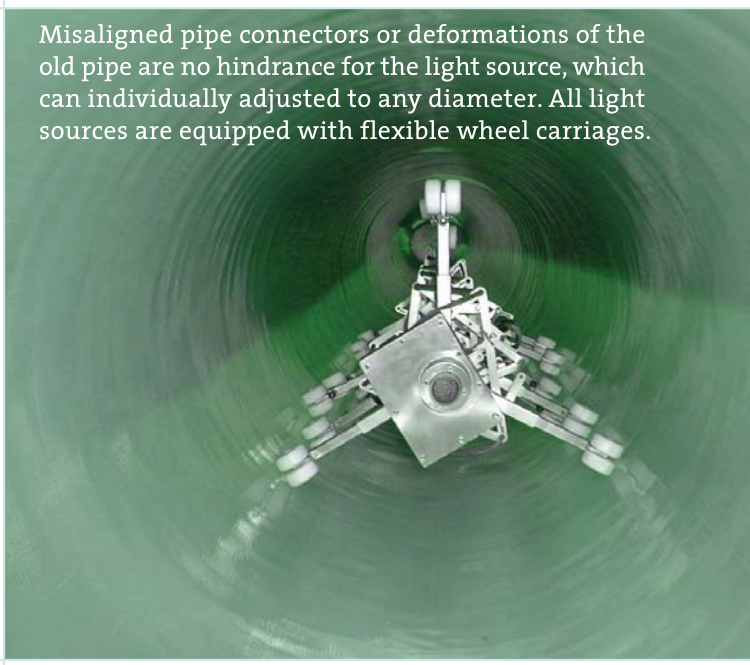
Orientation through certification

In April 2001, the Deutsche Institut für Bautechnik (DIBt – German Institute for Construction Technology) in Berlin issued to the Brandenburger pipe liner process the very first official approval ever given of a light-curing procedure (DIBt approval number Z-42.3-330). Furthermore, the process also satisfies the requirements of the RAL Quality Assurance GZ 961 published by the Deutsche Institut für Gütesicherung und Kennzeichnung e.V. (Commission for Delivery Terms and Quality Assurance). The requirements for an in-house quality label "Brandenburger Liner S27.18" are based on specification sheet 1 of the RSV (Pipe Rehabilitation Organisation) and on DIN-EN 13566-4. Only a comprehensive quality management system can guarantee the reproducibility of the required quality for each pipe liner at each construction site.

The control panel enables the user to control the curing process down to the last centimetre.

Abrasion resistance (Darmstadt trough test)	DIN 19565-1
Resistance against chemical attacks	DIN ISO 175
Resistance against chemical attacks in bent condition	DIN EN 1120
Chemical stability	DIN EN 1120
Impermeability inspection	In accordance with DIN EN 1610
3-point bending attempt	DIN EN ISO 178
High pressure flushing trial	Hamburg test
Apex pressure trial (short-time)	DIN EN 1228
Apex pressure trial (long-time 10,000 h test)	DIN EN 761
Static proof	ATV M 127-2
Environmental compatibility	Environmental compatibility of the materials used
Lengthwise examination (break bending, longitudinal tensile strength, tensile strength when breaking)	DIN EN 1393

Suitability test Brandenburger Liner



Misaligned pipe connectors or deformations of the old pipe are no hindrance for the light source, which can individually adjusted to any diameter. All light sources are equipped with flexible wheel carriages.

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