

# IKT

**IKT - Institute for Underground Infrastructure**



IKT, Gelsenkirchen, Germany

IKT – Institute for Underground Infrastructure is a **neutral, independent non-profit** institute, and works on solving practical and operational issues concerning underground sewers, pipes and other conduit engineering, its primary focus being on sewer systems. The institute conducts

- research projects,
- material testing,
- CIPP liner testing,
- consultations and
- seminars

on the construction, operation and renovation of underground infrastructures.

**IKT's main customers** are operators of both public and private networks. Its services are primarily focused on questions and problems encountered by network operators, activities which derive from the institute's **founding charter** of 1994. This states its aims as being the acquisition of scientifically founded expertise for the achievement of cost-effective, technically innovative, and both environmentally and customer-friendly installation, renovation and maintenance of conduit systems. IKT also performs other supporting activities in the

field of **testing** and **trial** of new products and methods for commercial companies.

## **IKT's activities in detail**



IKT jacking simulator, ND 1600

Practice-oriented research

Construction supervision, materials testing, flow measurement

Comparative Tests

Forums and networking

Advanced vocational training

Consultation and expert appraisals

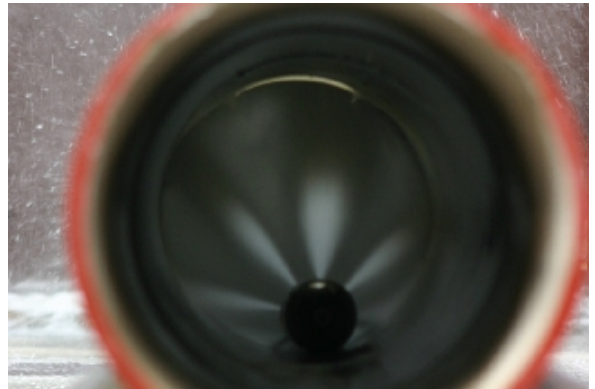
## **Practice-oriented research**

IKT's application-related research focuses predominantly on the solution of **network operators' problems and questions**. The institute maintains continuous close contacts with network operators, in order to identify topics that need attention. **Steering groups** of system operators support and monitor all IKT research projects. The members of these steering groups select the products to be tested and evaluated, determine boundary conditions for such tests, and are directly informed about the latest findings and developments at regular

intervals.

The first step in any IKT research project is a thorough analysis and definition of the problem. On conclusion of the work, **practical solutions** are then drafted, and subsequently implemented at pilot sites or incorporated into instructions for action and recommendations for the system operators.

## Research topics



Research for a gentle sewer cleaning technique

- Sewer operation
- Sewer cleaning
- Urban drainage
- Sewer renovation
- Pressurized waste-water lines
- Sewer manholes
- Sewer construction
- Pipe-jacking
- Root ingress
- HDD
- Drainage systems
- Stormwater
- Asset Management
- Broadband infrastructure

# Construction supervision, material testing and flow measurement



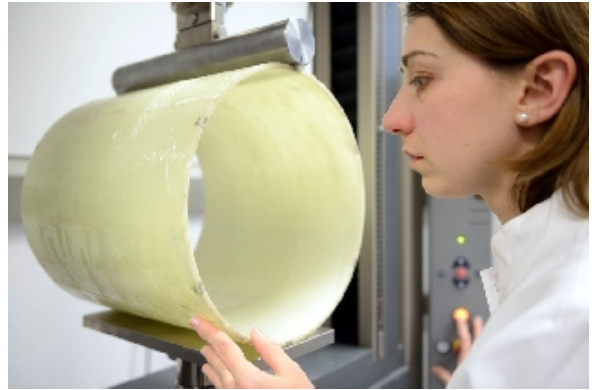
Tensile adhesion test on a coated manhole

The findings of IKT's research activities are incorporated, as appropriate, into the services provided by the institute.

IKT provides network operators with

- practical product and system tests for Quality Assurance purposes,
- construction supervision,
- comparative flow measurements at sewage treatment plants, storm-water tanks and reservoir channels,
- calibration of flow and control equipment, and
- tests in accordance with the self-diagnosis ordinances of the federal German states.

## IKT's three Test Centres



Crown pressure test on a CIPP liner

Services provided for product manufacturers:

- Developmental and performance tests
- standard materials tests
- DIBt certification testing
- Bespoke testing
- Testing to support method development

<b>Test Centre for construction products</b>	<b>Test Centre for flow measurements</b>	<b>Test Centre for stormwater</b>
Accredited in accordance with D-PL-18196-01-00 and DIBt-accredited test, supervision and certification centre	Nationally accredited in accordance with SuwV-kom NRW	DIBt-designated

<p style="text-align: center;"><b>Main focus</b></p> <ul style="list-style-type: none"> <li>• Materials tests (plastics, concrete, vitrified clay, CIPP liners)</li> <li>• Construction supervision</li> <li>• Quality Assurance (e.g. of sewer and manhole renovation projects)</li> <li>• Test institute for DIBt construction-supervision certification</li> </ul>	<p style="text-align: center;"><b>Main focus</b></p> <ul style="list-style-type: none"> <li>• Comparative measurements at sewage treatment plants, storm-water tanks, reservoir channels</li> <li>• Calibration of flow-measurement and control instruments</li> <li>• Tests in accordance with SwVo Abw and SwV-Kom <ul style="list-style-type: none"> <li>• Detection/quantification of extraneous water</li> <li>• Expert appraisals</li> </ul> </li> </ul>	<p style="text-align: center;"><b>Main focus</b></p> <ul style="list-style-type: none"> <li>• Testing of decentralised precipitation-water treatment facilities (DIBt)</li> <li>• Testing of waste-water treatment surfacings (DIBt)</li> <li>• Assessment of the comparability of performance of decentralised precipitation-water treatment facilities in North Rhine-Westphalia <ul style="list-style-type: none"> <li>• Laboratory and in-situ evaluation of the permeability performance of permeable paving systems</li> </ul> </li> </ul>
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## Comparative Tests



Construction of a sewer

system for Comparative Tests  
at IKT's large-scale test  
facility

IKT specialises in **Comparative Tests**, in which products and methods of installation and operation are intensively tested under both laboratory and field conditions. All Comparative Tests are conducted with input from a steering group of network operators to ensure the product will meet the requirements of end-users. Decisions concerning test methods, procedures and criteria, and **assessment of the results**, are taken jointly by the steering group, to ensure that the tests are performed on a relevant practical basis, are impartially performed, and are **not influenced by commercial interests**.

The test results supply sound and **reliable information** on the strengths and weaknesses of the products available on the market to network operators, enabling them to make purchasing decisions on the basis of evidence of performance , rather than unverified performance claims. IKT's Comparative Tests also provide the product supplier with evidence of their product's performance, criteria for the **improvement of their products** and testing procedures they can adopt in product development, which can enhance their market position.

## Forums and networking



Network members adopt common paths

IKT increasingly sees one of its major roles as providing a **platform** for development of **forums** and **networks**. The “Municipal Network for Site Drainage” (KomNetGEW) was established in 2008 and comprises sixty-five municipal network operators whose principal concern is “customer-friendly” implementation of sewer leak tightness testing in accordance with legal requirements (Article 61 of LWG NRW). Through this group materials for **PR activities** and **advisory services** for the public are centrally drafted under the overall leadership of IKT and provided for use by all participants. The KomNetGEW has, in addition, now also certified several hundred site drainage consultants and expert sewer leak-tightness inspectors.

IKTs **Sewer Operators Forum** was founded in 2011 and provides network operators with the opportunities for detailed exchanges of experience. The results of workshops, workgroups and research undertaken for this group are structured and summarised by IKT and distributed to the Forum.

## Advanced vocational training



Get ahead with training from IKT



Over the years, IKT has acquired a reputation as an institution for **advanced vocational training**. This includes the **certification of consultants** and sewer leak tightness inspectors.

The Site Drainage Day has also become a permanent feature in the industry's events calendar together with the Conduit Cleaning Day. The institute's training programme includes courses on a range of waste-water management topics, including manhole renovation and occupational health and safety.

## Consultation and expert appraisals



Consultancy: tapping IKT's knowledge and experience

IKT utilises its expertise derived from its research, inspection and testing activities, to provide consultancy to address specific issues encountered by **network operators**. These services include

- on-site analysis,
- feasibility studies,
- presentation and mediation,
- technical and economic assessments,
- economic and social cost analysis, etc.

IKT's services also include scientifically founded expert appraisals for courts, municipal and private system operators, building contractors, product manufacturers and engineering consultancies (e.g. expert damage assessments, expert opinions as evidence in court and in out-of-court settlements).

An overview of IKT's consulting services is shown below:

## **Sewer cleaning/operation**



IKT is advising on sewer cleaning and operation

Day of practical sewer operation, checking of tenders, assessment of damage caused by sewer cleaning (e.g. flow back-ups, cellar flooding, etc.), cause analysis of cleaning damage to sewage pipes, malfunction analysis (drain blockages, clogging, etc.), assessment of cleaning strategies, recommendations for non-destructive sewer cleaning, drafting of market surveys, recommendations concerning the high-pressure flushing resistance of pipe products, organisation and presentation of system operators' regional interest groups, optimisation of reporting.

## **New sewer construction**

Trenchless ("no-dig") installation (pipe-jacking), open-trench installation (timbering supported, pipe-trenches), statical calculations (stability), core drilling and testing (materials testing), damage documentation and assessment, registration and evaluation of current construction methods.

## **Manhole renovation**



Manhole renovation Research

Selection of renovation procedures, Quality Assurance for renovation projects, registration and assessment of renovation quality, analysis and evaluation of damage or failure following renovation, suitability testing of renovation systems.

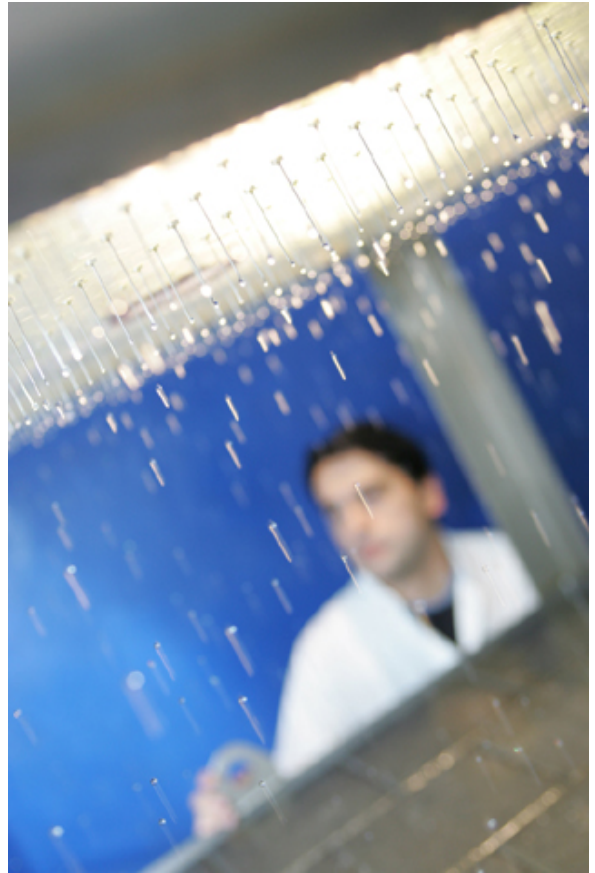
## **Sewer renovation**

Quality Assurance for renovation projects, recommendations concerning use of modern materials in sewer renovation (and plastics, in particular), CIPP liners, part-liners and coating methods; analysis and evaluation of damage or failure following renovation.

## **Urban drainage**

Trenchless installation methods (renovation of connection points and pipes), open-trench installation (pipe installation, connection to main sewer systems), malfunctions (drain blockages, clogging, etc.), damage documentation and evaluation, registration and evaluation of actual condition.

## **Water-permeable surface coating**



Testing water-permeable surface coatings

Seepage capacity, pollutant retention, drain performance, DIBt certification.

### **Root ingrowth into sewer systems**

Tree identification using samples of ingrown roots, documentation and evaluation of cases of damage, recommendations for the removal of ingrown roots and for repair of damage.

### **Reporting and self-diagnosis ordinance**

Consulting services on implementation of legal requirements (EKVO, SÜwVKan), Documenting and optimising organisational structures and work processes, updating of servicing and operating instructions to meet relevant requirements, finalising and systemising reporting, co-ordination with responsible supervisory authorities.

## **Flow analysis and comparative measurement**

Review of measuring instruments for use at storm-water tanks and sewage treatment plants, on-site comparative measurements using ultra-modern measuring instruments calibrated at regular intervals, measurement of extraneous water flows, determination of extraneous water sources and causes.

## **Economic analysis**

Cost benefit analysis comparing trenchless and open-trench installation methods, evaluation of investment and rehabilitation strategies, economic evaluation of sewer systems and structures, cost-cutting and economic optimisation provisions, macro- and microeconomic analysis.

## **More information?**

We are always pleased to answer your questions about our services – please contact us!