

IKT-LinerReport 2016: Five Companies Qualify for the '100% Club'



Three-point bending test on CIPP liners

There were excellent **CIPP liner results** for the individual test criteria, but only one in four of the rehabilitation contractors succeeded in a **100% pass** on all tests conducted on their samples. However, five years ago this figure was only one in five, so the overall trend is upward.

IKT – Institute for Underground Infrastructure presents its **13th annual LinerReport**. This is based on 1,845 CIPP liner samples taken on sites for **Quality Control** purposes during 2016 and tested by the **IKT CIPP Liner Test Centre**.

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The “100% Club”



The 100%-Club: Contractors that passed all test criteria for all samples in one year (2012-2016)

In the past five years, in particular, it has become apparent that a number of rehabilitation contractors achieve **optimum performance**. These companies meet all four test criteria with all their liner samples and thus constitute what we are calling the “**100% Club**”. Therefore, they are entirely **fulfilling the requirements** of the German “ZTV Material Test” (Supplementary Technical Contractual Conditions) and the **expectations of their customers**. Only five of the twenty-two companies are included in this Club in 2016 (in 2015 it was 9 of 24), and only few contractors maintain such high performance over several years.

Five contractors at the top

The 2016 results for the individual test criteria do exhibit **high average success rates**, but the overall quality of a liner is satisfactory only if it passes **all four test criteria**. The

five companies that achieved this in 2016 and the liner systems they used were:

- Arkil Inpipe (D), using the Berolina liner
- Hamers Leidingtechniek (NL), using the Alphaliner
- Jeschke Umwelttechnik (D), using the Brandenburger liner
- Kanaltechnik Agricola (D), using the iMPREG liner
- KTF Kanal-Technik-Friess (D), using the iMPREG liner

Modulus of elasticity was very good

The **modulus of elasticity** is an indication of the load-bearing capacity of liners. The average score per contractor for samples that passed the test was **98.9%**, only slightly below the 99.1% achieved in 2015. Most contractors achieved extremely good results for this test with thirteen achieving 100%. However, five companies performed less well than in the previous year.

Slightly poorer performance on flexural strength



Top performer: all four test criteria met by 100% of samples

The average for tests passed for **flexural strength** – the point at which a liner fails due to excessive stress – was 0.9 %

percentage points (%P) lower than in the previous year. However, at **98.4%** the average remains at a very high level. A total of sixteen companies achieved 100% pass, while three contractors had lower scores than the previous year.

Improvement in wall thickness, but wide variation in contractor performance

Among the four test criteria, **wall thickness** traditionally produces the poorest test results. 2016 was no exception, with an average of **96.2%** of the liner samples passing this test. Nonetheless this was a small rise, of 0.8%P, compared to the previous year. Seven companies passed all tests 100%. Among the four test criteria, the range of scores between the best and the poorest performing contractor is widest for wall thickness at 23.2%P.

Liners are watertight

The average for the **water-tightness** test criterion in 2016 was **99.1%** (+0.5%P on 2015) and is thus closely approaching the 100% mark. Fourteen of the contractors examined succeeded in achieving this maximum and passing the test 100% with all their liner samples. Only three companies performed less well than in the previous year. Overall, the 2016 test results demonstrate that CIPP liners are watertight.

Conclusions



Spot on! – 100% quality

Three conclusions can be drawn from the data presented here for the 2016 IKT LinerReport:

- Firstly, the **quality of CIPP liners has improved significantly** in recent years. Around 60% of all site samples submitted meet all four test criteria completely satisfactorily. This, conversely, also means that this has **not been achieved in 40%** of all cases.
- Secondly, only few rehabilitation contractors manage to **maintain the “100% passed” level** consistently over several years. For most contractors, meeting customers' requirements in all of their samples, i.e. 100%, is obviously an **extremely demanding target**. Quality fluctuates from year to year.
- Thirdly, the **slight downturn in quality** in also means that the trend is not necessarily always upward. It can dip downward again, and an upward trend is therefore not a matter of course.

The **liner manufacturers** and the **rehabilitation contractors** need to assign importance in the coming years to achieving even better, and constantly high, **quality**. The aim must be that all liners, and not just around a quarter as in 2016, meet the **quality criteria 100%**.

However, there is also an obligation on the majority of **municipal clients** and **water companies**: they must insist on quality from the contractors, and must consistently have **samples** from each CIPP liner site **tested**.

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