BTO *Executive Summary*

Burst tests increase understanding of material properties of degraded asbestos-cement pipes

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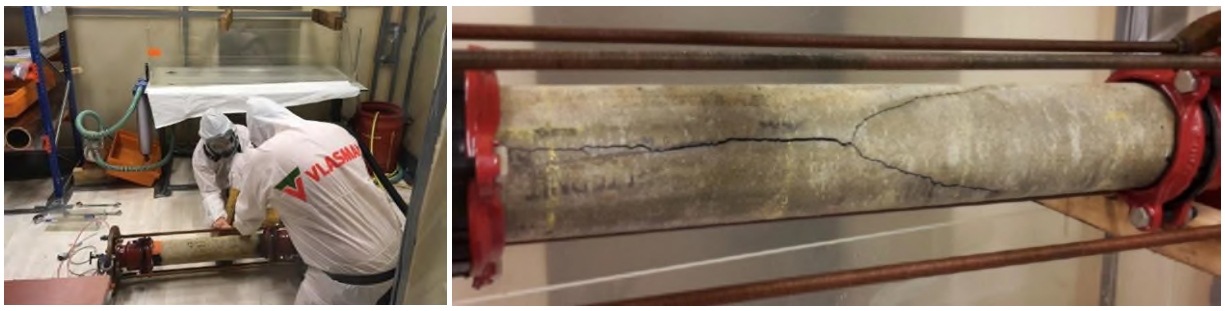
Knowledge about the aging of asbestos cement, and of the impact of this aging on the material's strength, is crucial to making predictions about the condition of asbestos-cement (AC) pipes. This research involved the mechanical testing of the strength properties of pipes that had aged in the field. The values found for stiffness and failure stress are considerably below the catalogue values that have been used until now. With these more realistic strength properties, more reliable predictions can be made in prioritising the replacement of AC pipes.



Asbestos-cement pipes taken from the field are, under controlled conditions, subjected to internal pressure until bursting to get an insight into their residual strength following many years' usage.

Interest: prioritising AC pipe replacement

Roughly 25% of the drinking water transport and distribution network in the Netherlands is still made of asbestos-cement (AC). Drinking water utilities aim to replace AC pipes over the next decades. To determine which pipes should be replaced first, knowledge about the degradation of these pipes, and the impact of this degradation on their strength, is crucial.

Approach: 30 pipe segments were tested with georadar, thymolphthalein and mechanical testing

Thirty asbestos-cement pipe segments taken out due to replacement works, were used for this research. The degradation was determined using the established techniques: georadar and thymolphthalein. The strength properties (stiffness and failure stress) of the pipes were then mechanically tested in the Microlab of the Faculty of Civil Engineering and Geosciences at Delft University.

Results: stiffness and failure stress considerably below catalogue values

The stiffness and failure stress values found were considerably below the catalogue values that have been used until now. This suggests that the pipes are less strong than thought, and that the current strength calculations need to be sharpened.

Implementation: more realistic strength properties for condition models

The outcomes provide the current condition models for AC pipes with more realistic strength properties to allow for better predictions.

Report

This research is described in the report *Sterkteonderzoek asbestcementbuizen* (BTO-2019.008).