

T 2761

Study on non-destructive testing of joint tape junctions

Summary

Joint tapes are used on innumerable construction sites for the watertight sealing of joints. In many cases, the tapes have to be joined together. At present, such tape junctions can only be tested subjectively by visual inspection or by feeling in the tape manufacturer's laboratory and on site. A reproducible, non-destructive and objective test method does not exist. TV shearography was therefore to be investigated as a means of testing elastomer and thermoplastic tape junctions in order, above all, to assist the construction supervisory authorities in exercising their supervisory function in future.

Various joint tape junctions with artificial flaws were produced for these investigations using the thermoplastic joint tape "Tricomer D320/9" and the elastomer joint tape "Elastomer FM350". Among other things, a diode-pulsed solid-state laser (type NdYAG, power output 100 mW, wavelength 532 nm) and various test instruments modified in accordance with the joint tapes were used for these investigations.

Cylindrical cavities measuring more than approx. 2 mm in diameter, for example, were located in the extensive laboratory trials regardless of the tape material used (elastomer or thermoplastic), provided that the thickness of the material covering the flaw (i.e. depth of the flaw) did not exceed roughly twice the diameter of the flaw.

A laboratory test unit and an on-site test unit were developed, built and tested. Flaws of a certain type and size can be located in level elastomer and thermoplastic butt junctions with the aid of these test units. However, branched junctions (X, T and L junctions) should primarily be monitored in the laboratory. For the first time, tape junctions can be tested reproducibly, non-destructively and objectively with the test equipment available.