Leak-tightness studies for sheet pile locker under chemical influences with the sealant Wadit®, on the example of Creosote

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Unternehmensgruppe TÜV NORD

Task / Aim of the project

DMT GmbH & Co. KG has been tasked to analyse the Ball and Socket locker systems, product WOM-XL 100 and WOF-XL 105 by the company WALL-PROFILE based on the density and the resistance under chemical influences. The sheet pile locker of these products have been sealed by Wadit®.

Test sample creation

To investigate the density of Wadit® under chemical influences four sheet pile locker have been sealed by Wadit®. These are assembled laterally in slotted synthetic boxes and luted by silicone.

The created test sample have been analysed on their density by filling onesided water in it.

If the density of the lateral silicone gasket and the sealed sheet pile locker could be proved, soil material has been filled onesided in the test piece.

The soil has been accumulated with the chemical wood preservative Creosote.

The soil sample can be discribed as hand wet.

Creosote is a complex mixture consisting of organic components, which are used as a wood preservative in the USA. It can be produced by carbonating of coke and/or bituminous coal under high temperatures.

Creosote consists of 85% PAH, 10% Phenol and 5% Heterozycles with nitrate, sulfate or oxygen contents. Attached are a product information sheet and a register of the chemical main components.

Test procedure

The prepared test sample had a residence time of 12 hours, 24 hours and 72 hours. One test sample has been kept 72 hours under 30℃.

After an density analysis the material of the test piece was directly exposed 48 hours to Creosote.

After the residence time the soil / Creosote has been removed and the density of the test sample has been analysed.

The following table shows the experimental procedure:

No.	Residence time in hour	Creosote [%]	Notes
1	12	10	none
2	48	10	none
3	72	10	none
4	48	100	No. 4: additional 48 hours residence time with 100% Creosote

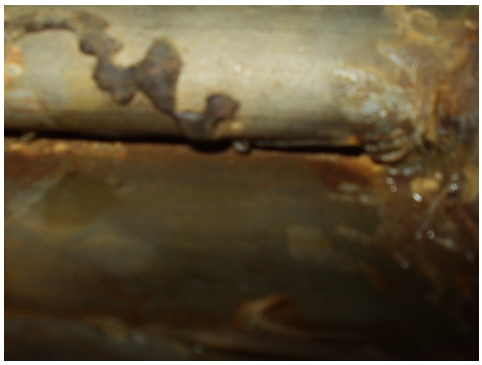
Results

A. residence time 12 hours

The 12 hour sample showed during the test with water no leakages.

A structure change of Wadit® could not be found. The flexibility remained.

The contact power of Wadit® is unchanged.



B. residence time 48 hours

The 48 hour sample showed during the test with water no leakages.

A structure change of Wadit® could not be found. The flexibility remained.

The contact power of Wadit® is unchanged.

C. residence time 72 hours below 30℃

The 72 hour sample below 30℃

showed during the test with water no leakages.

A structure change of Wadit® could not be found. The flexibility remained.

The contact power of Wadit® is unchanged.

D. residence time 48 hours, direct contact with Creosote

The 48 hour sample showed during the test with water no leakages.

A structure change of Wadit® could not be found. The flexibility remained.

The contact power of Wadit® is unchanged.

The following table shows the test results:

Sample	Density of the sheet pile locker against water (after contact with Creosote)	Visible damages / alterations of Wadit®
A	dense	none
B	dense	none
C	dense	none
D	dense	none

Conclusions

The sheet pile locker, which were sealed with Wadit®, show no leakages under the above discribed conditions.

No Influences on the Wadit® could be detected by diluted (with soil) or by undiluted (without soil, direct contact with the test sample) Creosote.

The Wadit® shows no visible changes and alterations regarding the contact power and flexibility.

Kind regards
DMT GmbH & Co. KG

(Kappernagel) (Grube)

Attachments