



HIT-RE 500 V4 injection mortar

Test report

Injection mortar system



Information covered

HIT-RE 500 V4 and Threaded rods

Asphalt
as base material

Hilti Test report HIT-RE 500 V4

Disclaimer

All test results itemized in this test report are based upon the test constellation and its respective parameters described in this test report and the principles, formulas and safety factors set out in the Hilti technical instructions, the operating manuals, the setting manuals, the installation manuals and other data sheets. These test results are only valid for applications done in accordance with the test constellation as described herein. The test results exclusively refer to the tested items defined in this test report.

Any deviation from the test constellation as described in this test report (especially local characteristics) may lead to different results. Therefore, we recommend performing on-site testing to determine performance at any specific site.

This test report is only valid in its entirety and, therefore, may only be handed on or copied unchanged.

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This test report is originally issued in English language. If translated into other languages, the original English version of the test report shall prevail.

Scope

This report is a test report of pull-out tests with HIT-RE 500 V4 used for anchoring and gluing in asphalt base material. The task of the performed tests was to **generate an initial opinion** of the performance of HIT-RE 500 V4 in asphalt as base material.

Preliminary notes

This test report describes the behavior of HIT-RE 500 V4 in the specific test situation.

Many aspects have not been addressed by testing but may be relevant for application cases.

These aspects are e. g.:

- Mechanical properties and composition of the asphalt and its variation
- Conditions of the asphalt as age, temperature, humidity
- Sizes of the fasteners and embedment depth
- Long term stability and durability
- Behavior under permanent loads
- Safety concept




Commonly asphalt is not a solid base material in view of fastenings, like e.g. concrete. Especially transferring permanent loads is critical.

Test plan, test setup and test conditions

| Test plan | | | |
|-------------|--|--------------------------------|-----------------------------|
| test series | type [-] | drill hole diameter d_0 [mm] | setting depth h_{ef} [mm] |
| 1.0 | Confined tension test | 14 | 70 |
| 1.1 | | 18 | 70 |
| 2.0 | Unconfined tension test ¹⁾ | 14 | 70 |
| 2.1 | | 18 | 70 |
| 3.0 | Pull-off test ²⁾ | - | - |

1) $d_{support} \approx 200$ mm

2) pull-off plate $d=50$ mm, $A=1963$ mm²




| Test setup | |
|---|--|
| test setup test series 1 and 2 | test setup test series 3.0 |
|  |   |

| Test condition | |
|---------------------|--|
| Test series 1 and 2 | <ul style="list-style-type: none"> Asphalt quality unknown; Asphalt thickness approx. 100 mm. Anchor type: Threaded rod M12, steep grade 12.9 Hammer drilling with Hilti TE 30 Embedment depth: 70 mm Drill hole diameters: 14 and 18 mm Drill hole cleaning (CAC: compressed air cleaning) as specified in the installation instruction Mortar injection as specified in the installation instruction Temperature of asphalt about 18 to 20°C during anchor setting |
| Test series 3.0 | <ul style="list-style-type: none"> Temperature of the asphalt about 10°C during pull-off test Curing time: 7 days |

Test results

| Summary of test results | | | | | | |
|-------------------------|---------------------------------------|--------------------|-----------------------|------------------------|---------|----------------------------|
| test series | type [-] | mean h_{ef} [mm] | number of tests n [-] | mean failure load [kN] | CoV [%] | failure mode ¹⁾ |
| 1.0 | Confined tension test | 71,8 | 5 | 22,6 | 13 | 5x Bb |
| 1.1 | | 73,5 | 6 | 29,7 | 10 | 6x Bb |
| 2.0 | Unconfined tension test ¹⁾ | 71,8 | 5 | 20,1 | 9 | 5x (Bb+Ac) |
| 2.1 | | 71,6 | 5 | 22,0 | 6 | 5x (Bb+Ac) |
| 3.0 | Pull-off test ²⁾ | - | 7 | 6,4 | 5 | 7x APo |

¹⁾ Bb: Bond borehole, Bb+Ac: Bond borehole with asphalt cone, APo: asphalt pull-off

| Observed failure modes | | |
|---|--|---|
| Bond borehole | Bond borehole with asphalt cone | Asphalt pull-off |
|  |  |  |