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# TEST TO PROVE THE WATER TIGHTENING ACTIVITY OF PENETRON ADMIX IN CASE OF CRACKS IN CONCRETE

To prove the water-tightening power of Penetron-Admix concrete-bars with the dimension of 15x15x60cm have been produced. A hollow area has been embedded (by pulling out a plastic tube after curing of the concrete). Additionally two reinforcing bars have been embedded (shown in the following pictures)

A pre-mixed concrete type of the quality C 16/20 has been used. After 28 days of curing the bars have been placed in a concrete testing machine and pressure was applied as much as necessary so that the bar broke and a crack has been formed.

To test the water-permeability the hollow space has been filled with water each 24 hours. By permanent refilling the flow-out thorough the crack within 15 minutes has been determinated. The samples 1 and 6 (marked with *) have been connected to the water-pipe and a permanent water flow of 215 ml/min (measured at free flow out) has been adjusted. The following pictures show the situation.

The necessary amount of water to keep the tube in concrete filled to the top can bee seen out of the table bellow:

| Waterflow in Milliliter per 15 Minutes | | | | | | | |
|---|---|---|---|---|---|---|---|
| | WITHOUT ADMIX | | | | WITH ADMIX (1% on cement) | | |
| Sample Nr.: | 1 | 2 | 3 | | 4 | 5 | 6 |
| Start | 1023 | 465 | 2256 | | 7,5 | 7,5 | 5 |
| after 2. day | *1914* | 468 | 2190 | | 3 | 3,5 | *3,5* |
| after 4. day | *1596* | 90 | 240 | | 5 | 2 | *1* |
| after 6. day | *1605* | 9 | 87 | | 3,5 | 2 | *1,5* |
| after 8. day | *1705* | 6,3 | 3 | | 3 | 2 | *1* |
| Shock by dropping after 8. day | | | | | | | |
| after 8. day | *2163* | 615 | 3330 | | 1,5 | 2 | *1* |

*** permanent waterflow**

As shown in the table above the tightening power by the addition of Penetron Admix by the formation of “Penetron-Crystals” starts immediately. Additionally it is shown that at a water addition in a distance of 24 hours (sample 2,3,4 and 5 specially at sample 2 and 3), obvious by drying between water addition, the flow through the crack has been reduced and has becoming almost completely tight after 8 days. On the other hand, at sample 1 where a permanent water-flow has been applied, the amount of water flowing through the crack has been quite unchanged.
Out of practice we know that by permanent shrinkage of the concrete further on stress is applied to the crack. To simulate this the concrete bar has been dropped so that the crack had to handle this force. By this test one could see that the “tight” cracks in concrete without Penetron Admix opened again and water flows in even higher amounts as at the start. On the other side this treatment to the cracks at the concrete with Penetron Admix had no influence.