

**PROF. DIPL.-GEOLOGE JÜRGEN TEUBERT**  
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**MAX FRANK GmbH + Co. KG**

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**Aufhausen,  
3 Sept 1996**

**Subject: Test report:  
Water pressure test on FRANK plugged fibre concrete distance tubes**

**Test subject:**

**Impermeability to water of FRANK plugged ( $\varnothing$  22) fibre concrete distance tubes, the walls under test being plugged on both sides with FRANK plugs, using FRANK epoxy adhesive.**

**Reason for test:**

**It is required to be established whether FRANK plugged fibre concrete distance tubes can be used on a water pressure retaining installation in site-mixed concrete. The maximum water pressure to be withstood is 30 bar.**

**Manufacture of the test pieces:**

**On 24.06.1996 a test wall was constructed from concrete, having the dimensions: 100x95x24 cm.**

**Four FRANK fibre concrete distance tubes were inserted at a height of 25 cm. These distance tubes were obtained from the FRANK stores and were 25 days old.**

**Concrete recipe:**

<b>105</b>	<b>kg</b>	<b>Cement PKZ 35</b>
<b>22.5</b>	<b>kg</b>	<b>Silica</b>
<b>502</b>	<b>kg</b>	<b>Concrete gravel</b>
<b>60</b>	<b>litres</b>	<b>Water</b>

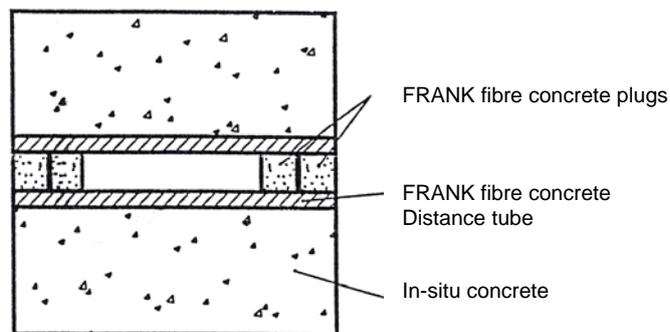
**After 24 hrs the formwork was removed, the test wall dampened and covered with film.**

**Plugging the distance tubes:**

**On 22.07.1996 the FRANK distance tubes were plugged with two FRANK plugs (ex FRANK stores) on each of the sides to be subjected to the water pressure. Then on 26.07.1996, two FRANK plugs were fitted on each of the respective opposite sides.**

FRANK epoxy adhesive\* was used.

The sketch below shows the installation of the FRANK distance tubes and the plugging with FRANK fibre concrete plugs.



#### Set up and timing of the water pressure test:

A test flange having a diameter of 10 cm was attached on the water pressure side.

In order to better assess the amount of water ingressing into the construction, the water was coloured using Rhodamin B red dye. The wall reinforcements tested were plugged using FRANK epoxy adhesive\*. (\* Trade name: FRANK Repoxal gluer)

The test surfaces were subjected to water pressure at the following times and pressures:

Commencing on 02.08.1996 and 10.08.1996

48 hrs	1	bar
24 hrs	3	bar
24 hrs	7	bar
24 hrs	15	bar
24 hrs	30	bar

#### Test results:

At the end of the tests it was apparent that:

1. The plugged wall distance tubes remained absolutely water tight up to 30 bar.
2. The bond between the distance tube and the concrete was also watertight.

The test results demonstrate, that the plugged FRANK distance tubes are unrestrictedly suitable for concrete structures that are impermeable to water.