













Fig. 3 Brazilian test for tensile strength measurements

order to conduct flexural strength tests (modulus of rupture), a prismatic specimen (Fig. 1) of 50×10×10 cm was used through two point loading method. Cylindrical specimens (Fig. 2) of 10 cm diameter and 20 cm height were used in order to evaluate tensile strength of the concrete (Brazilian method<sup>1</sup>, Fig. 3), while post-flexural test prismatic specimens were used to determine compressive strength of the concrete.

Specimen strength values were tested at the ages of 7 and 28 days under conditions of specimen treatment inside a water pool at ambient temperatures of 23 and 25°C, respectively. For the sake of calculating water absorption value for the concrete specimens, they were weighted at an age of 28 days before being dried under saturation with dry surface conditions at 110°C for 24 hours. Compressive and tensile strengths of the specimens were measured by a pressurized hydraulic jack of 500-2000 kN capacity, while flexural strength was measured via two point loading procedure with a pressurized hydraulic jack of 50-100 kN loading capacity. In order to investigate microbial contamination of the concretes with micro-silica gel additives, a concrete pool of 25×40×40 cm were constructed using micro-silica gel bearing concrete. At the end of a 28-days treatment period, bacteriological examinations were performed along with HPC2 on the stored water inside the previously constructed water pools via the standard method. The results of microbial contamination examinations are reported in Table 4.

### 3. Results and interpretations

#### 3.1 Physical properties and mechanical strength test results

The results of compressive, flexural and tensile strengths of the specimens are summarized in Table 3 and Fig. 4. As shown, generally due to completion of hydration process throughout the time, strength values exhibit an increasing trend with time and at any given age, the concrete

<sup>1</sup>In practice, the cylindrical specimen was subjected to a compressional load along its diameter while its tensile strength was measured.

<sup>2</sup>9215 Heterotrophic Plate Count – 2004













