1.14.1. TESTING OF FRESH CONCRETE USING A MODIFIED VERSION OF THE PRISM TECHNIQUE

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In testing fresh cementitious materials using techniques based on ultrasound, many difficulties are encountered related to the setting of the whole measurement system and procedure, namely, the shape and preparation of samples, the choice of the right transducer and type of wave, the type of coupling medium, the choice of a data acquisition system, signal processing and displaying of results. The technique described in this paper addresses the above mentioned issues by adapting a special technique – the so-called Prism Technique to the testing of fresh cementitious materials. The new system is able to test cementitious materials both during setting and hardening phases, using both compressional and shear waves. In addition, it is possible with this technique to carry out measurements in both reflection and transmission modes, and thus enabling the evaluation of several parameters, such as reflection coefficients, energy, and speeds of ultrasonic waves in a continuous manner. These parameters are directly related to the changing characteristics of the material under investigation. Practical measurements have been made on different mortar samples, and very encouraging results have been achieved.