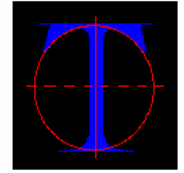


# STRUCTURES DATA SHEET 4

## Rebound Hammer Testing

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The strength of concrete is generally governed by the strength of the cement paste. Measurement of the strength of the paste can therefore provide a reasonable indication of the strength of the concrete and the strength can be determined by inference from the elasticity of the concrete. A practical assessment of elasticity can be made on site by measuring the rebound of a sprung hammer.



Rebound hammer in use

The Rebound (or schmidt) hammer is an easy to use instrument, which provides a quick and simple non-destructive test for obtaining an immediate indication of concrete strength in various parts of a structure. The minimum verifiable strength is 1400 PSI (10 MPa) and can be carried out under the guidance of BS1881- 202 or ASTM C805 to assess the general quality, uniformity, and relative strength of concrete members.

The conversion of rebound number to compressive strength can be achieved by producing a calibration graph for the concrete concerned. This is undertaken by testing previously sampled concrete cubes and then crushing in accordance with BS 1881. If cubes are not available then cores may be extracted from the sample test location and crushed to determine in-situ strength.

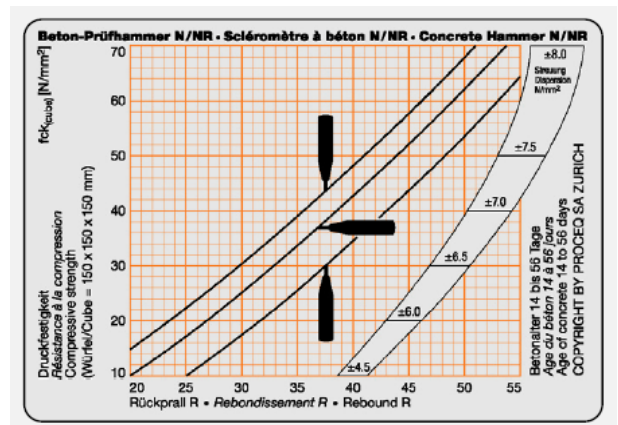
The calibration chart may then be used to convert rebound numbers to estimated cube strength. It is likely that 95% confidence limits on the estimated strength will be better than +/-25% under ideal conditions.

In practice the test is considered to be very dependent on the surface condition, type and size of aggregate. The test is therefore best used as a comparative test to identify areas of lower strength concrete which may then be sampled by coring and tested to determine in-situ strength by conventional crushing in accordance with BS 1881 pt 109.

If it is not possible to produce a calibration graph, most makes of rebound hammer are supplied with a conversion curve, which will enable the average rebound value to be converted to an estimated concrete strength in N/mm<sup>2</sup>. The angle of application needs to be taken into account to give the correct reading.

Taking the limitations of the method into account the Rebound hammer is still a valuable tool in the NDT arsenal available to test engineers to assess the condition of in-situ concrete, rapidly, impartially and in difficult locations.

Test results can also be correlated with ultrasonic test methods, which can also indicate changes in concrete strength non-destructively, but will give a better indication of variations in concrete property below the surface. Concrete testing programs devised by Testconsult will always consider the most appropriate test method to suit the information required and the contract budget.



Rebound hammer conversion chart – c/o proceq