ABSTRACT

The maturity method computes maturity of the concrete as an index to predict concrete strength gain during curing. It is computed by using maturity models based upon time-temperature history. Two models, namely, the Nurse-Saul and the Arrhenius function are generally used. The Nurse-Saul function has been extensively used in determining strength gain of concrete cured in the temperature range of 10 to 32°C. Studies conducted in the last decade have indicated that Arrhenius model is valid under much wider temperature conditions relative to the Nurse-Saul function.

The maturity method has been successfully implemented in numerous construction projects to monitor strength gain. This method is preferred over others by some engineers due to its simplicity in combining the effects of fluctuating temperatures on strength development. This method can be as accurate as the method for strength determination by drilled cores if a proper relation between maturity and strength is established prior to its use. The factors such as type and source of materials, w/c, and temperature conditions to suit local conditions, etc. should be taken into account in developing this relationship. This paper reviews published studies and discusses use of the maturity method for in-situ strength measurement.