# MODIFIED ASTM C157 TEST METHOD
LENGTH CHANGE TESTING WHEN EVALUATING CONEX, TYPE G EXPANSIVE COMPONENT

EUCLID CHEMICAL

The modified ASTM C157 test method allows for the measurement of early expansive properties that would not be captured when testing in accordance with the standard ASTM C157 procedure. With approximately 90% of CONEX expansive properties occurring in the first 24 hours, the need exists for early demolding of specimens and initial readings taken at 12 hours. Section 4.3 of ASTM C157 allows for modifications if conditions other than specified are required. ***It is important to understand this test can only be properly conducted in a concrete laboratory environment.**

Materials: 4"x 4" x 11.25" beam mold, small tamping rod, mallet, 2 gauge pins and strike off bar

Spray a light coating of form release

Before inserting the gauge pins into the mold, lightly spray the mold with a form release to ensure the specimen does not become damaged while demolding.

Set the pins
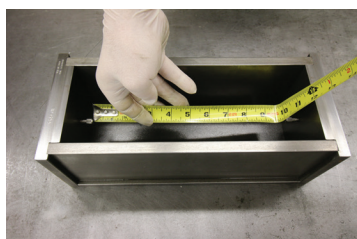
After the form release has been applied to the mold, make sure the pin holes are not over coated with form release and screw the pins in, exactly 10" from inner end to inner end as shown in the picture.

PINS MUST BE CLEAR OF ANY FORM RELEASE

Filling and Consolidation

Fill in 2 equal layers and properly consolidate each by rodding 45 times per layer and lightly tapping the outside of the mold 10-15 times with the mallet. If using fiber reinforced concrete, use external vibration only.

Specimen Finishing

After consolidating the beam, strike off excess material with a straight edge and clean the excess paste from the mold.

Initial 12 Hour Storage

After finishing the surface, simply cover the mold with plastic and store in a moisture controlled environment for 12 hours.

Demolding

At 12 hours carefully remove the specimen from the mold. Care must be taken not to disturb the pins and this area should remain free from any cracks or damage. The pins should be set firmly in place of the concrete on each end.

Initial Measurement
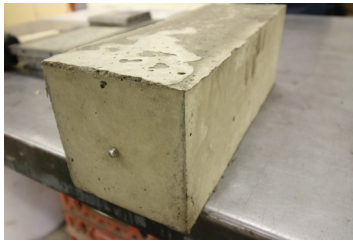
IMMEDIATELY after demolding, an initial comparator reading must be made. **This step is critical**, as this measurement will be used as the initial reading for future length change calculations. Due to the nature of CONEX and its expansive properties, this modification is necessary because 90% of expansion occurs in the first 24 hours.

Lime Water Bath

As soon as the initial reading is complete, place the specimen in a saturated lime water bath. Additional comparator readings should be made at 24, 48, and 72 hours as well as one at 7 days in the saturated wet cure condition.

Air Storage Measurements
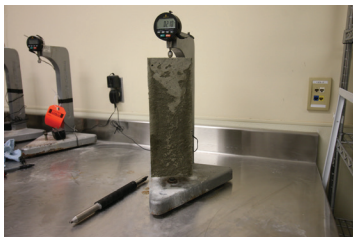
Finally, after the 7 day wet cure, remove the specimen from the lime water bath and place in a temperature and humidity controlled room at 50 ± 4% RH and a temperature of 73 ± 3° F. Make subsequent air storage readings at 7, 14, 21 and 28 days. Continue this process if additional measurements past 28 days are needed.

Net Length Change Calculation

When determining length change using CONEX, **it is critical** to use the 12 hour reading as the initial reading for all calculations. Use the following ASTM C157 calculation:

$$\Delta L_x = \frac{(CRD - 12 \text{ hour initial CRD})}{G} \times 100$$

ΔL_x: length change of specimen at any age %
CRD: difference between the comparator reading of the specimen and the reference bar at any age
G: the gage length of 10 inches