

RECOMMENDATIONS

Information and Guidance on the Testing of Lightweight Concrete

Quality control testing of lightweight concrete for temperature (ASTM C1064), sampling fresh concrete (ASTM C172), making and curing test specimens (ASTM C31), and slump (ASTM C143) is conducted the same as testing of normal weight concrete, but there are differences that should be remembered when testing for lightweight concrete density and air content.

Air Content

The air content of fresh structural lightweight concrete should be monitored closely and controlled to ensure that the density requirements are being met. Testing for air content must be according to ASTM C173 *Air Content of Freshly Mixed Concrete by the Volumetric Method*, or calculated using the gravimetric method described in ASTM C138 *Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete*. The apparatus used in the volumetric method is usually referred to as a roll-a-meter. It measures the air contained in the mortar fraction of the concrete, but is not affected by air that may be present inside the porous lightweight aggregate particles. **DO NOT USE A PRESSURE METER.**

Density (Unit Weight)

It is recommended that designers specify the required density range as calculated equilibrium density as determined by ASTM C567 *Standard Test Method for Determining Density of Structural Lightweight Concrete*. This test method further references ASTM C138 *Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete*. Table 1 in ASTM C138 specifies the minimum capacity of the “measure” or bucket to be used. This table allows a bucket as small as 0.2 cubic feet when the nominal maximum size of the coarse aggregate is one (1) inch.

To reduce multiplication error, it is strongly recommended that the unit weight/density bucket be at least 1/2 cubic foot.