Guide Specification for

Lightweight Concrete Masonry Units

Note: Requirements for the PyroTherm Masonry Wall System accurately reflects the performance of typical lightweight block currently manufactured in the markets served by TXI expanded shale and clay lightweight aggregate. For more information on this wall system, view our Masonry section for physical properties such as block weights, fire ratings, R-values, etc. To purchase these units please see our Directory of Qualified Block Producers.

SECTION 04200

Part 2. PRODUCTS

Specifier Note: ASTM C 90 block strength requirement is a minimum of 1900 psi net compressive strength as an average of three units with no individual block being lower than 1700 psi net compressive strength. Accordingly, lightweight block concrete density (mass) is required to be less than 105 pcf when oven dry. Experience over time indicates that typical lightweight block manufactured in most block plants have a safety factor resulting in tested values of around 2200 psi.

High strength block: A higher block strength than that required by ASTM C 90 may be specified where required by design. Check with local producers as to availability of units with higher compressive strength. Compressive strengths up to 3800 psi can be achieved in typical lightweight concrete block using TXI expanded shale or clay lightweight aggregate with adjustments in concrete mix design and manufacturing. Block producers can contact TXI for technical assistance.

B. Strength: For concrete masonry units, the tested average net area compressive strength of three units shall equal or exceed the specified strength of 1900 psi, and the tested unit net area compressive strength of each individual unit shall have a minimum net area compressive strength of 1700 psi.

C. Density: Lightweight concrete masonry units shall have an oven dry density of less than 105 lb/cu ft as determined by methods described in ASTM C 140 “Sampling and Testing Concrete Masonry Units”.

Specifier Note: The density of typical lightweight block in the market usually is between 95 to 97 pcf. Contact block producer for current test report. Concrete density (mass) as low as 85 pcf can be achieved using TXI expanded shale or clay without sacrificing strength or performance.

D. Lightweight concrete masonry units shall be from a single source. The lightweight aggregate used in the manufacture of the concrete masonry unit shall be TXI structural grade expanded shale or clay (a recycled material) and shall exceed minimum requirements of ASTM C 331 “Standard Specification for Lightweight Aggregate for Concrete Masonry Units". The blending of potentially harmful recycled materials containing unacceptable levels of

industrial contaminants as defined by the EPA or other deleterious substances which would impair fire ratings or insulation values is prohibited. All units shall be free of organic impurities that will cause rusting, staining or popouts and shall contain no combustible material.

Fire Ratings: The producer of the concrete masonry units shall furnish certification from an independent testing laboratory that concrete masonry units supplied to the project are deemed to comply with assumed fire ratings as defined by code for individual block sizes. Submittals shall include the test reports indicating the equivalent thickness, materials used, and the calculated fire rating for each masonry unit size specified. Aggregates used will not impair fire rating calculations for individual block sizes. See Item D. above.

Specifier Note: All aggregates used in fire-rated concrete masonry must be aggregates listed in ACI 216, Table 1 – Fire resistance rating of concrete masonry assemblies as referenced by the IBC, Section 720 and 721. Claims regarding fire-rated concrete masonry units manufactured using aggregates or recycled material aggregates not listed in Table 1 must be substantiated by full-scale fire wall testing according to the requirements of ASTM E 119 “Standard Test Methods for Fire Tests of Building Construction and Materials”. A copy of the ASTM E 119 test report for masonry containing non-standard materials should be requested indicating that the block intended for the project will perform in a fire-rated assembly.

Thermal Resistance: The producer of the concrete masonry unit shall, in the test report, report the concrete density (mass). Note: Refer to NCMA TEK 6-2A for conservative mid range R-values that can be used based on concrete density.

Specifier Note: The R-values for lightweight concrete masonry units *increase dynamically* due to less thermal bridging through the masonry webs containing low density concrete when cores of the block are insulated.

Certification and Testing: The producer of the block shall submit certifications of compliance with ASTM C 90, C 331, C 33, and any other test requirements at least 60 days prior to any jobsite delivery. Field sampling of concrete masonry units shall be conducted during construction by an independent testing laboratory according to the requirements of ASTM C 140. Note: Field monitoring of lightweight concrete blocks can be accomplished by weighing dry units on-site.