Expanded Shale, Clay and Slate
is the Lightweight Aggregate of Choice
for

Adhered Manufactured Stone Masonry Veneer

ESCSI

Expanded Shale, Clay and Slate Institute
Rotary Kiln Structural Lightweight Aggregate

Expanded Shale, Clay and Slate is the Lightweight Aggregate of Choice for

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Stone veneer has been used in construction since the Roman Empire. Today, Adhered Manufactured Stone Masonry Veneer is a lightweight concrete manufactured synthetic stone made to resemble natural stone in size, shape and texture. The manufactured stone units are wet-cast into handcrafted molds and are typically comprised of a combination of cement, supplementary cementitious materials, lightweight aggregates, chemical admixtures and mineral oxide color pigments.

Uses

The manufactured stone units are used as an adhered, non-load-bearing exterior veneer or interior wall finish. The units are designed for vertical applications and can be installed on any properly prepared substrate such as concrete, masonry, drywall or plywood.

Producing Quality Manufactured Stone Units

To ensure quality, the manufactured stone units must comply with ASTM C1670. The lightweight aggregate used must meet the requirements of ASTM C330 or C331. Expanded Shale, Clay and Slate (ESCS) meets these requirements and is the aggregate that gives manufactured stone producers the quality, strength and consistent performance they desire. ESCS is a ceramic material produced by expanding and vitrifying select shale, clay and slate in rotary kilns. The process produces a high quality lightweight aggregate that is structurally strong, physically stable, durable, environmentally inert and light in weight.

ESCS is manufactured to exacting gradation requirements to allow predictable and consistent concrete performance.

Concrete made with ESCS exhibits exceptional resistance to freezing and thawing damage versus other non-engineered lightweight aggregates. This is due to a higher aggregate-cement paste adhesion, aggregate strength and the reduction of internal stresses due to elastic matching of the ESCS aggregate and the cement paste. These properties reduce microcracking which reduces the migration of water into the concrete.

In addition to superior freeze-thaw performance, manufactured stone units made with ESCS lightweight aggregates offer many other advantages:

- Higher strengths
- Lighter in weight
- Less shrinkage
- Less chipping
- Less cracking
- Less waste
- Easier to handle and store
- Supports sustainability
  - Reduces transportation costs up to 1/2
  - Contributes to thermal mass of the building envelope and ESCS units have four times the R-value per inch of Natural Stone

Technical Information

ASTM C1670

Adhered Manufactured Stone Masonry Veneer Units

(Review the full standard for complete details)

Lightweight aggregates

- Comply with ASTM C330/C330M or C331/C331M Standards

Minimum concrete performance

- Compressive Strength – ASTM Test Method C39/C39M
  - *Average minimum 2,100 psi (15 MPa)*
- Freezing & Thawing – ASTM Test Method C666/C666M
  - *Mass Loss < 1.5% @ 50 cycles*

Unit physical properties

- Thickness
  - *Minimum thickness – 1/4" (6 mm)*
  - *Average thickness ≤ 2-5/8" (67 mm)*
- Shear Bond Strength – ASTM Test Method C482
  - *Minimum 50 psi (350 KPa)*
- Saturated Density – ASTM Test Method C140
  - *Weight per square foot ≤ 15 lb/ft²*
  - *Equivalent to ≤ 90 lb/ft³ for 2" thickness*
- Linear Drying Shrinkage – ASTM Test Method C426
  - *Shrinkage < 0.065%*

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