Thin Brick Testing

Parker Stroble
The National Brick Research Center
Overview

- ASTM C1088

- PCI Standard
  - Thin Brick Units
  - Pre-Cast Concrete Panels
Designation: C1088 – 12

Standard Specification for Thin Veneer Brick Units Made From Clay or Shale
Tests

- Absorptions
  - Cold Water Absorption
  - Boiled Water Absorption
  - C/B Ratio

- Efflorescence

- Dimensions/Distortion

*All according to ASTM C67
## Specifications

- **Absorptions**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Maximum Water Absorption by 5-h Boiling, %</th>
<th>Maximum Saturation Coefficient^A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average of 5 units</td>
<td>Individual</td>
</tr>
<tr>
<td>Grade Exterior</td>
<td>17.0</td>
<td>20.0</td>
</tr>
<tr>
<td>Grade Interior</td>
<td>22.0</td>
<td>25.0</td>
</tr>
</tbody>
</table>

- Same limits as C216, C652
PCI Standard for Thin Brick

Methods and Specifications
Thin Brick Unit Tests

- *Dimensions & Distortion
- Absorption (CWA)
- Efflorescence
- Modulus of Rupture
- Chemical Resistance (ASTM C650)
- Surface Coloring (F/T)
# Thin Brick Unit Specs

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption (CWA)</td>
<td>6% Maximum</td>
</tr>
<tr>
<td>Efflorescence</td>
<td>“not effloresced”</td>
</tr>
<tr>
<td>Modulus of Rupture</td>
<td>250psi Minimum</td>
</tr>
<tr>
<td>Chemical Resistance (C650)</td>
<td>“not affected”</td>
</tr>
<tr>
<td>Surface Coloring (C67 F–T)</td>
<td>“no observable difference”</td>
</tr>
</tbody>
</table>
Pre-Cast Panel Tests

- 10 samples
  - First 5: ASTM E488 (Modified) Tensile Strength
  - Second 5: ASTM C666 Rapid Freeze-Thaw
    - then E488 Tensile Strength
# Pre-Cast Panel Specs

<table>
<thead>
<tr>
<th>Property</th>
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</tr>
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<tbody>
<tr>
<td>Tensile Bond Strength</td>
<td>150psi Minimum (both before and after F–T)</td>
</tr>
<tr>
<td>Freeze–Thaw Resistance (C666 A)</td>
<td>“no detectable deterioration”</td>
</tr>
</tbody>
</table>
Samples before Tensile Testing
Sample during Tensile Testing
Sample after Tensile Testing
Summary

- ASTM C1088
  - Tests, Specs

- PCI Standard
  - Thin Brick Units
  - Pre-Cast Concrete Panels
  - Tests, Specs
Questions?