Pre-blended Portland Cement
Plaster and Silos

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BMI Products
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Although it goes by many names, from Portland cement plaster to Hard Coat Stucco, everyone has seen, worked, or lived in a stucco-clad structure.

As its popularity rises, proper specification and installation becomes most critical for ensuring long-term performance and crack resistance.

Today’s presentation will help you better understand:

- Field-mixing – Concentrates - Premixed products
- Issues affecting the plaster mix
- Environmentally-friendly silos and mixers
- Industry Personnel
- Plastering-related issues
- and....more.
Introduction

From the Late 1990’s to Present

Through Research + Development, plaster & products to render exceptional properties such as:

- increased hardness
- better flexibility to prevent cracking
- water resistance (yet remaining vapor permeable)
- better workability
- faster curing
- premixed materials
- lamina/level coat
- faster applications
- wide array of finishes
- and more……..have been developed.
There are 3 Types of Delivery Methods for Portland Cement Plaster

- Traditional field-mix
- Concentrate
- Premixed - Option for various Silo-mixers
Lets Take a Look

• Field-Mixed Plaster
Field Mix

- Sand piles are messy and prone to contamination
- Many jobsites do not have room for a pile
- Some locations and/or jurisdictions have regulations on storm water runoff
- Builders can face huge fines if caught allowing materials to run into storm drains
Problems: Impurities of Aggregates

- Many contractors order plaster sand with no concern for its purity
  - Should be measuring it on every job
- Many local plaster sands test above 70 and 80 and should produce solid plaster
- Lower SE sands require more water, which leads to more shrinkage cracking, lower strength, and lower density

4A: Plastic cement with a SE=49 sand (9 gallons water)

4D: Plastic cement with a SE=86 sand (6.75 gallons water)
Problems: Impurities of Aggregates

- ASTM D2419 is the Standard Test Method for Sand-equivalent Value of Soils and Fine Aggregate (SE) is an easy and fast way to test for impurities.
- Add roughly equal parts sand and water, shake in bottle to put in suspension.
- Allow to settle 20 minutes, measure what percentage of aggregate is sand, the higher % is better.

1/8” silt, 
2-1/2” sand
SE=2.5/2.675
SE = 93

5/8” silt, 
1-1/4” sand
SE=1.25/1.875
SE = 67
Sieve Analysis or Gradation Test

• This ASTM E-11 procedure is used to assess the particle size distribution
• It is often of critical importance to the way the material performs in use
• This being a simple technique of particle sizing is the most common
• Clays
  – Absorb water from the mix, then shrink as they dry and cause cracking
  – A little clay helps plaster “slip” through the hose when pumped and improves workability, but can be problematic if too much used

• Dark aggregate:
  – Dark spots can peek through light colors in finish coat and make plaster look dirty
Problems: Impurities of Aggregates

- **Iron**
  - Small amounts of iron contamination in the sand can lead to rust spots
  - Costly to repair

- **Bond-breakers**
  - Oils can affect bond between coats
Problems: Sand Gradation

- Plaster sand should meet the requirements of ASTM C897, (not ASTM C144) which specifies a size profile of:

<table>
<thead>
<tr>
<th>Sieve Standard</th>
<th>Natural Sand</th>
<th>Manufactured Sand</th>
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<tbody>
<tr>
<td></td>
<td>Max.</td>
<td>Min.</td>
</tr>
<tr>
<td>No. 4</td>
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<td>0</td>
</tr>
<tr>
<td>No. 8</td>
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<td>40</td>
<td>10</td>
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<td>No. 30</td>
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<td>70</td>
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<tr>
<td>No. 100</td>
<td>100</td>
<td>95</td>
</tr>
<tr>
<td>No. 200</td>
<td>100</td>
<td>97</td>
</tr>
</tbody>
</table>
Melding Together Properly

All the same size has too many voids

• Variation in sieve sizes (Gradation)
The Sand Issue

- Problems with Today's Sand:
- Variation of particle sizes
- Lack of quality control at jobsite
- Too much sand affects integrity of mixture
- Issue of sand piles on jobsites, cannot accommodate space, contamination, clean-up
- On site injury due to repetitive shoveling and heavy lifting

- Resolution:
- Preblended basecoat mixes were developed to solve these challenges
Advantages of Preblended Products

- High quality, consistent, premixed plaster:
  - Use dried and graded sand that complies with ASTM standards and should not have any of the problems with impurities or gradation
  - Does not rely on contractor to accurately measure the various plaster materials
  - Goes through manufacturer’s Q.C./Q.A process
- Reduces cracking thanks to proper proportions and performance additives
- Consistent appearance of finish
- Cleaner overall jobsite
- Complies with storm water runoff requirements
- Less room devoted to plastering footprint on jobsite
- Less prone to contamination on jobsite
Bagged Products

- Stucco manufacturers all offer preblended base coat products
  - Scratch and brown coats
  - Continuous insulation base coats (one coat)
- Some products have different attributes
  - Additives for pumpability, water reducers, etc.
  - High early strength for accelerated work scheduling, cold weather
  - Fibers for crack-reduction, added strength
- Lowest cost next to field-mixed base coats
Concentrates

PREMIUM FIBERED STUCCO CONCENTRATE & LIQUID ACRYLIC ADDITIVE FIELD MIX SITE
Manual Labor
10 Ton Mini Silo w/ inline mixer
Filling the Mini-Silo
Mini Silo Servicing Project
Options for Premix

- Premixed plaster comes in a 80-90lb. bag of factory-blended materials

- Some manufacturers offer premixed Super Sacks 2,500 – 3,000 lbs using a mini-silo

- Another, an environmentally-friendly 30 ton silo/mixer
What is an ICC Report?

The ICC-ES (International Code Council Evaluation Service) is an independent evaluation organization that provides technical review and evaluation of building products and systems to ensure they meet the requirements of the International Building Code (IBC) and other relevant codes. An ICC-ES evaluation report is a document that certifies that a product or system meets the necessary code requirements. This certification can help streamline the approval process for new products and materials in the building industry.

In the context of the image, the text is discussing the evaluation of a product called "EMI 600 Plaster." The report likely includes details on the composition, durability, and testing of this plaster, confirming its compliance with the relevant building codes.

For more information, you can visit the official ICC-ES website at www.icc-es.org.
These are categories which most Premixed & Engineered Plaster can earn LEED accreditation points for a project under **Material & Resources**:

- Storage & collection of recyclables
- Construction waste reuse or recycling
- Reuse of materials
- Use of local materials and fabrication (within 500 miles)
- Airborne dust collection system and air quality (silos)
- Storm drain pollution prevention program
Newest Plaster Manual

2012

• Plaster Assemblies Manual

  • www.tsib.org
  • (714) 221-5530
• PLASTER RESOURCES

• 2012 Plaster Assemblies Manual by TSIB (MUST HAVE)
• 2010 Plaster Textures & Acrylic Finishes by TSIB (MUST HAVE)
• 2008 Selected ASTM Standards by TSIB
• 2007 Portland Cement Plaster (Stucco) Manual by PCA
• 2007 Builders Guide to Stucco – Lath and Plaster by Max Schwartz with Walter F. Pruter
• 1997 Portland Cement Plaster/Stucco Resources Guide by the Northwest Walls & Ceilings Bureau, or other local plastering industry offices (OUTDATED)
Our Industry Bureaus

- **Plaster Industry Bureaus and Directors:**

- Mark Eisenmann  NWCB  206-524-4243
- Terry Kastner  NWCB  206-524-4243
- James Johnson  WACA  415-519-9963
- Frank Nunes  WACA  925-600-0475
- Michael M. Logue  TSIB  714-256-1244
- Bryan Stanley  TSIB  714-256-1244
- Mark Fowler  WWCCA  714-221-5520
- Norma Fox  SMA  949-640-9911
- Melody Shupe  APLC  619-749-1667
- Robert Campbell  WWCCA/LV  702-319-2717
- Albert Carrillo  WWCCA/AZ  480-829-9133
Advantages of Silo Systems

• **#1 BENEFIT:** Quality Control and Quality Assurance

• Preblended materials to exact ASTM C 926 Standard
• Material contributes to LEED accreditation points
• Greater productivity and efficiency of labor force
• Inherently safe delivery method - lessens contractor liability
• Silo/mixer/pump function as *single unit* making for an efficient delivery system and cost effectively brings Portland cement plaster to their point of use
• All materials are weighed prior to blending assuring consistency
• Uniform color throughout the job
• No freezing of product in winter, no water damage to products
• Environmentally-friendly, re-useable silos, no dust or disposal of bags, no waste of product
What Our Industry is Saying

• “Once you adjust the water flow to the silo-mixer, the mix will come out consistently all day long. You just push a button on and off and it takes the workload and stress of your hod carrier”

• “One person does the work of many other laborers and their health is much better not shoveling sand all day long and lifting heavy sacks. This system prevents back injury.”

• Due to environmental concerns, silos cut down or eliminate any dust which is an advantage since it is a more controlled environment.”

• “The only time you see the product is when it comes out of the mixer in wet form.”

• “One of the biggest problems in the field has been consistency. Since the product is premixed, it takes away that issue of uncertainty and not having the right amount of each ingredient”

• “You get the right mixture every time. There is no way you can go wrong with it.”

• “The silo delivery system for plaster (in my opinion) is the future. Field mixed products are an inaccurate science and with the level of scrutiny our contractors are under on projects, this system is perfect.”
Whatchawannano?

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