


ASTM C305

Standard Practice for Mechanical Mixing of Hydraulic
Cement Pastes and Mortars of Plastic Consistency

**Understanding ASTM International Test Procedures
for Cement and Concrete - Staying Up to Standard**


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Outline

- ▶ Objectives
- ▶ Related Procedures
- ▶ Scope/Significance and Use
- ▶ Key Terminology
- ▶ Apparatus
- ▶ Temperature and Humidity Requirements
- ▶ Understand Limitations of Procedure


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Objectives


- ▶ Define Key Terminology
- ▶ Identify Necessary Equipment
- ▶ Understand Sources of Errors
- ▶ Understand Limitations of Procedure

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Related Procedures

- ▶ ASTM C511 - Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes
- ▶ ASTM - C778 Specification for Sand

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Scope/Significance and Use

- ▶ **Scope:** Practice of Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic
- ▶ **Significance and Use:** This practice is intended for use in the mechanical mixing of pastes and mortars for the testing of hydraulic cements.




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Terminology


- ▶ Hydraulic Cement - a binding material that sets and hardens by chemical reaction with water and is capable of doing so underwater. For example, portland cement and slag cement are hydraulic cements
- ▶ Paste (Neat Cement Paste) - a mixture of hydraulic cement and water
- ▶ Mortar - a mixture of cement paste and fine aggregate.


Source: American Concrete Institute CT-13: ACI Concrete Terminology

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Apparatus: Supplementary


- ▶ Scraper
- ▶ Semi-rigid Rubber
- ▶ Balances, graduated cylinders



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Temperature and Humidity Requirements

- ▶ The temperature of the air and mixing water shall conform to the requirements of Specification C511.
 - Air – Temp. $23.0 \pm 4.0^{\circ}\text{C}$
 - Mixing Water - shall be $23.0 \pm 2.0^{\circ}\text{C}$
- ▶ The relative humidity of the laboratory shall conform to the requirements of Specification C511.
 - Relative Humidity - not less than 50 %


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Procedure: Mixing Pastes

1. Place Dry Paddle and Bowl in Mix Position
2. Add All Mixing Water to Bowl
3. Add Cement to Water Allow 30s for Absorption
4. Start Mixer and Mix at Slow Speed for 30s
5. Stop Mixer for 15s Scrape Down Paste
6. Start Mixer at Medium Speed for 60s

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Procedure: Mixing Pastes



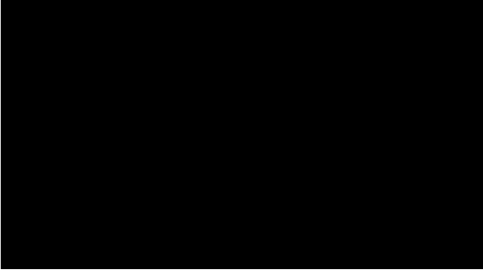
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Procedure: Mixing Mortars

1. Place Dry Paddle and Bowl in Mix Position
2. Add All Mixing Water to Bowl
3. Add Cement to Water Allow Then Start Mixer at Slow Speed for 30s
4. Add All Sand While Mixing Over 30s
5. Stop Mixer, Change to Medium Speed, and Mix for 30s
6. Stop Mixer, Let Mortar Stand for 90s, Scrap Mixer Down, and Keep Bowl Covered
7. Mix for 60s at Medium Speed

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Procedure: Mixing Mortars



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Limitations and Errors

- ▶ Gauging time should be strictly observed.
- ▶ Room temperature should be well maintained as per test requirement.
- ▶ All apparatus used should be clean.
- ▶ Spacing between bowl and paddle is critical.

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Questions & Answers
