

ACI 546.4R-20

IN-LB

Inch-Pound Units

SI

International System of Units

Guide for Jobsite Quality Control and Quality Assurance of Cementitious Packaged Materials

Reported by ACI Committee 546



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Guide for Jobsite Quality Control and Quality Assurance of Cementitious Packaged Materials

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American Concrete Institute
38800 Country Club Drive
Farmington Hills, MI 48331
Phone: +1.248.848.3700
Fax: +1.248.848.3701

www.concrete.org

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Reported by ACI Committee 546

Peter Barlow, Chair

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Richard Montani

Don T. Pyle
Nicholas R. Triandafilou
Patrick M. Watson

*Subcommittee Chair.

This guide provides recommended practices for jobsite quality control and quality assurance for use of cementitious packaged materials.

Keywords: cementitious packaged materials; quality assurance; quality control.

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CHAPTER 1—INTRODUCTION AND SCOPE

1.1—Introduction

Packaged materials are used for a range of construction and repair activities. Packaged materials can be an economical alternative when small quantities of concrete, mortar, or grout are needed or where larger quantities of material that would be provided by concrete trucks or volumetric mixers (site batching) are not practical. Other reasons for use of packaged materials include cases where specific characteristics are needed, such as rapid strength gain, or where certain materials are required that would be hard to disperse in ready mixed concrete, such as high volumes of fiber or silica fume. Packaged materials may also be required in areas with limited access, such as balconies on high-rise buildings, congested industrial environments, or structures not capable of supporting the weight of a concrete truck.

The successful use and performance of packaged materials is dependent on many factors that include the selection of materials, storage, surface preparation, mixing, placement, finishing, and curing.

Manufacturing of packaged materials standards include **ASTM C387/C387M** and **ASTM C1480**. The manufacturer usually provides product information, testing data, and guidelines for product use in technical data sheets. The contractor and owner's representative can also have an independent testing agency perform field testing to verify material properties provided that the manufacturer's published test methods are sufficiently documented to reproduce the results (**ACI 563-18**, Section 8). This field testing can be performed periodically to verify that the product meets requirements of the manufacturer and the contract documents, and to help identify problems or deficiencies with the packaged material or application procedures. The type and frequency of testing should be established prior to production work and discussed during a preconstruction meeting. Field testing is required in some jurisdictions. The contract documents should specify use of the manufacturer's requirements for storage, preparing, mixing, placing, and curing the packaged material. If contract documents have not been provided, then the manufacturer's requirements should be used wherever in this guide the term "contract documents" is used.

1.2—Scope

This guide provides recommended practices for the site use, testing, quality control, and quality assurance of packaged materials. Use of this guide by the licensed design

professional, contractor, or owner's representative is intended to increase the probability that the packaged material provides the desired results and to decrease the incidences of undesired outcomes.

This guide is not intended to cover the performance of repair work, such as demolition, surface preparation, installation of supplemental reinforcement, and other steps in repair work that do not use packaged materials.

CHAPTER 2—DEFINITIONS

ACI provides a comprehensive list of definitions through an online resource, ACI Concrete Terminology. Definitions provided herein complement that resource.

lot—packaged material provided from a single production run of mixed ingredients at a manufacturing facility.

packaged material—contains dry ingredients such as cement, fine aggregate, mineral fillers, supplementary cementitious materials, fibers, and admixtures in proportions that provide the fresh and hardened properties indicated on the manufacturer's technical data sheet when the recommended amount of liquid and admixtures, components, and coarse aggregate are mixed with the contents.

slake time—time between initial mixing and ingredients reacting sufficiently to provide a stable mixture for testing and use.

CHAPTER 3—PACKAGED MATERIALS

3.1—Selecting packaged materials

Various characteristics and properties to be considered when selecting a packaged material:

- (a) Minimum compressive strength
- (b) Modulus of elasticity
- (c) Tensile strength
- (d) Shrinkage
- (e) Coefficient of thermal expansion
- (f) Creep coefficient
- (g) Density
- (h) Cracking resistance
- (i) Time for strength gain (for example, setting time and time to gain full strength)
 - (j) Minimum or maximum thickness of application
 - (k) Flowability, workability, and slump range
 - (l) Placement method (for example, form and pour, trowel-applied, pneumatically applied)
 - (m) Durability (freezing-and-thawing resistance, exterior exposure, air content)
 - (n) Working time
 - (o) Compatibility with materials
 - (p) Aesthetics
 - (q) Yield/coverage rate

Technical data sheets, guide specifications, and other information from the manufacturer provide information to aid in the selection of a packaged material based on properties, intended use, and characteristics required. **ACI 364.3R** and **546.3R** and **ICRI Technical Guidelines No. 320.2R** and **320.3R** discuss properties and characteristics along with test