IN-LB	Inch-Pound Units
SI	International System of Units

Cementitious Repair Material Data Sheet—Guide

Reported by ACI Committee 364

ACI PRC-364.3-22

American Concrete Institute
Always advancing

American Concrete Institute
Always advancing

First Printing
October 2022
ISBN: 978-1-64195-199-9

Cementitious Repair Material Data Sheet—Guide

Copyright by the American Concrete Institute, Farmington Hills, MI. All rights reserved. This material may not be reproduced or copied, in whole or part, in any printed, mechanical, electronic, film, or other distribution and storage media, without the written consent of ACI.

The technical committees responsible for ACI committee reports and standards strive to avoid ambiguities, omissions, and errors in these documents. In spite of these efforts, the users of ACI documents occasionally find information or requirements that may be subject to more than one interpretation or may be incomplete or incorrect. Users who have suggestions for the improvement of ACI documents are requested to contact ACI via the errata website at http://concrete.org/Publications/DocumentErrata.aspx. Proper use of this document includes periodically checking for errata for the most up-to-date revisions.

ACI committee documents are intended for the use of individuals who are competent to evaluate the significance and limitations of its content and recommendations and who will accept responsibility for the application of the material it contains. Individuals who use this publication in any way assume all risk and accept total responsibility for the application and use of this information.

All information in this publication is provided “as is” without warranty of any kind, either express or implied, including but not limited to, the implied warranties of merchantability, fitness for a particular purpose or non-infringement.

ACI and its members disclaim liability for damages of any kind, including any special, indirect, incidental, or consequential damages, including without limitation, lost revenues or lost profits, which may result from the use of this publication.

It is the responsibility of the user of this document to establish health and safety practices appropriate to the specific circumstances involved with its use. ACI does not make any representations with regard to health and safety issues and the use of this document. The user must determine the applicability of all regulatory limitations before applying the document and must comply with all applicable laws and regulations, including but not limited to, United States Occupational Safety and Health Administration (OSHA) health and safety standards.

Participation by governmental representatives in the work of the American Concrete Institute and in the development of Institute standards does not constitute governmental endorsement of ACI or the standards that it develops.

Order information: ACI documents are available in print, by download, through electronic subscription, or reprint and may be obtained by contacting ACI.

Most ACI standards and committee reports are gathered together in the annually revised the ACI Collection of Concrete Codes, Specifications, and Practices.

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

www.concrete.org

ACI PRC-364.3-22

Cementitious Repair Material Data Sheet—Guide

Reported by ACI Committee 364

Benoit Bissonnette,* Chair

Paul E. Gaudette, Secretary

Randal M. Beard
Ryan Alexander Carris
Larry D. Church
Bruce A. Collins
Timothy R. W. Gillespie
Fred R. Goodwin*
Pawan R. Gupta
Ann Harrer
John L. Hausfeld
Charles J. Hookham
Liying Jiang
Ashok M. Kakade
Keith E. Kesner
John S. Lund
Marjorie M. Lynch
Surendra K. Manjrekar
James E. McDonald
Murat B. Seyidoglu
Kyle D. Stanish*
David A. VanOcker
David W. Whitmore

Consulting Members

Robert V. Gevecker
Stephen A. Johanson
Emory L. Kemp
K. Nam Shiu
Weilan Song
Dela Tharmabala
Alexander M. Vaysburd
William F. Wescott

*Members who prepared this guide.

Note: Special acknowledgments to M. Kennedy and A. Larson for their contributions.

The purpose of this document is to provide a guide to the protocol for testing and reporting of data for cementitious repair materials. It does not address all the issues associated with material selection. It is the responsibility of the user of this document to determine the suitability of the repair material before use.

Keywords: data sheet protocol; material characteristics; material properties; packaging; repair materials; test methods; user guide.

ACI Committee Reports and Guides are intended for guidance in planning, designing, executing, and inspecting construction. This document is intended for the use of individuals who are competent to evaluate the significance and limitations of its content and recommendations and who will accept responsibility for the application of the material it contains. The American Concrete Institute disclaims any and all responsibility for the stated principles. The Institute shall not be liable for any loss or damage arising therefrom.

Reference to this document shall not be made in contract documents. If items found in this document are desired by the Architect/Engineer to be a part of the contract documents, they shall be restated in mandatory language for incorporation by the Architect/Engineer.

CONTENTS

CHAPTER 1—INTRODUCTION AND SCOPE, p. 2
1.1—Introduction, p. 2
1.2—Scope, p. 2

CHAPTER 2—DEFINITIONS, p. 3

CHAPTER 3—REPAIR MATERIAL DESCRIPTION, p. 4

CHAPTER 4—PACKAGED DRY MATERIAL CONTENT CHARACTERISTICS, p. 5
4.1—Total sulfur trioxide (SO_3), p. 5
4.2—Total alkali content, p. 5
4.3—Chloride content, p. 6
4.4—pH, p. 6
4.5—Characteristics of aggregate, p. 6

ACI PRC-364.3-22 supersedes ACI 364.3R-09 and was adopted and published in October 2022.

Copyright © 2022, American Concrete Institute.

All rights reserved including rights of reproduction and use in any form or by any means, including the making of copies by any photo process, or by electronic or mechanical device, printed, written, or oral, or recording for sound or visual reproduction or for use in any knowledge or retrieval system or device, unless permission in writing is obtained from the copyright proprietors.

CHAPTER 5—FRESH STATE CHARACTERISTICS AND PROPERTIES, p. 8
5.1—Consistency, p. 8
5.2—Material unit weight, p. 8
5.3—Time of setting, p. 8
5.4—Air content, p. 8
5.5—Yield, p. 9

CHAPTER 6—HARDENED STATE CHARACTERISTICS AND PROPERTIES, p. 10
6.1—Curing of specimens used in characterization tests, p. 10
6.2—Density, absorption, and voids, p. 10
6.3—Air content, p. 11
6.4—Compressive strength, p. 11
6.5—Splitting tensile strength, p. 11
6.6—Flexural strength, p. 12
6.7—Direct tensile strength, p. 12
6.8—Short-term tensile bond, p. 13
6.9—Modulus of elasticity, p. 13
6.10—Compressive creep, p. 14
6.11—Coefficient of thermal expansion, p. 15
6.12—Length change, p. 15
6.13—Restrained expansion, p. 16
6.14—Cracking resistance, p. 16
6.15—Resistance to freezing and thawing, p. 17
6.16—Scaling resistance, p. 17
6.17—Electrical indication of concrete's ability to resist chloride ion penetration, p. 18
6.18—Chloride ponding, p. 19
6.19—Bulk electrical resistivity or conductivity, p. 20
6.20—Sulfate resistance, p. 20
6.21—Chemical resistance, p. 20

CHAPTER 7—PACKAGING INFORMATION AND CONTENT, p. 22
7.1—Packaging information, p. 22
7.2—Package mass and condition, p. 22

CHAPTER 8—HOW TO USE THE MATERIAL, p. 23
8.1—Concrete substrate preparation, p. 23
8.2—Bonding agent, p. 23
8.3—Aggregate extension, p. 23
8.4—Mixing, p. 23
8.5—Volume yield calculated from mass per unit volume of material, p. 23
8.6—Application and finish, p. 23
8.7—Curing, p. 24
8.8—Cleanup, p. 24
8.9—Safety, p. 24
8.7C—Curing, p. 24

CHAPTER 9—REFERENCES, p. 25
Authored documents, p. 26

CHAPTER 1—INTRODUCTION AND SCOPE

1.1—Introduction

The guidance on testing and reporting verifiable properties of mortar, extended mortar, and concrete is primarily intended for the manufacturer, to make sure the repair material data sheets are prepared in a standard way, with reproducible and comparable information. The manufacturer should use it for developing products based on market needs and technology improvements. The information provided in this guide is useful to the specifier in choosing verifiable properties consistent with the requirements of a particular repair situation. It provides the general user education on the range of material characteristics and properties that may impact a repair and on the nuances of the various tests available for that matter.

1.2—Scope

To facilitate readability of this guide, Chapters 4 through 8 are in two-column format. The first column provides guidance for the protocol for testing and reporting of data for cementitious repair materials to allow objective comparison between alternative products. The second column provides guidance and referenced sources for additional information presented in the first column. It does not address every issue associated with material selection; for further discussion, refer to ACI 546.3R. The characteristics and properties described in this document do not necessarily need to be reported, depending on the nature of the material and its intended use. Certain tests may not be appropriate for some materials. Materials containing lightweight aggregate or heavyweight aggregate are beyond the scope of this document, as typically specialized tests are required for these materials.

The test methods used for the determination of the reported data should be selected from those listed in Table 1.2 and further explained within the document. The table covers most of the characteristics and properties generally of interest for cementitious materials, although it does not preclude others to be reported. Test data should be reported in the order and sections as listed, with the test method(s) used explicitly mentioned adjacent to it. Variations in the standardized test methods or substitute test methods prevent direct comparison between alternative materials by the specifier. Any additional test methods, non-standardized methods, or deviations from the test methods in this document should be reported and documented in sufficient detail to allow the specifier to evaluate the likely impact on test results and to allow other laboratories to repeat the testing within acceptable repeatability and reproducibility.

Additional information describing the significance and use of the test methods described herein may be found in ACI 546.3R and ICRI 320.2R. In comparison with these documents, ACI 364.3R/ICRI 320.3R serves a very different purpose—that is, guidance on uniformized testing and reporting Material Data Sheet information. While ACI 546.3R lists standardized tests only, without directions, ACI 364.3R/ICRI 320.3R provides guidance on testing and

American Concrete Institute – Copyrighted © Material – www.concrete.org