

Standard Specification for Bonding Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive (ACI 503.1-92, reapproved 1997)*

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This specification describes the work of bonding hardened concrete, steel, wood, brick and other materials to hardened concrete with a multi-component epoxy adhesive such as defined for this purpose in ASTM C 881. It includes controls for adhesive labeling, storage, handling, mixing and application, surface evaluation and preparation as well as inspection and quality control.

Keywords: **adhesives**; aluminum; **bond (concrete to concrete)**; **bonding**; bricks; concrete construction; copper; **epoxy resins**; **hardened concrete**; quality control; safety; **specifications**; standards; steels; wood.

FOREWORD

This foreword is included for explanatory purposes only; it does not form a part of Standard Specification ACI 503.1.

This specification is a reference standard which the Architect/Engineer may cite in the project specifications, together with the supplemental requirements for the specific project. It is written in terse, imperative language and is

ACI Committee Reports, Guides, Standard Practices, and Commentaries are intended for guidance in designing, planning, executing, or inspecting construction and in preparing specifications. References to these documents shall not be made in the Project Documents. If items found in these documents are desired to be a part of the Project Documents, they should be phrased in mandatory language and incorporated into the Project Documents.

divided into two sections: general requirements and materials and applications, including a section on the all-important surface preparation.

This document covers materials and methods for bonding concrete, steel, wood, brick, aluminum, copper, and other materials to hardened concrete.

This specification is written in the section and three-part format of the Construction Specifications Institute, but with the numbering system modified to ACI requirements.

A specification guide and checklist are included as a preface to, but not forming a part of, Standard Specification ACI 503.1. The purpose of this guide and checklist is to assist the Architect/Engineers' designer(s) and specifier(s) to properly choose and specify, the necessary supplemental requirements for the project specifications.

*Adopted as a standard of the American Concrete Institute effective June 1979, in accordance with the Institute's standardization procedure. It was revised according to the expedited procedure effective October 1986 and March 1992.

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SPECIFICATION GUIDE

SG1-Standard Specification ACI 503.1 is intended to be used essentially in its entirety, by citation in the project specification, to cover all usual requirements for bonding hardened concrete, steel, wood, brick, and other materials to hardened concrete with a multi-component epoxy adhesive. Individual sections, parts, or articles should not be copied into project specifications since taking them out of context may change their meaning's.

SG2-However, adjustments to the needs of a particular project shall be made by the Architect/Engineer's designers and specifiers by reviewing each of the items indicated in this specification guide and checklist and then including their decisions on each as mandatory requirements in the project specification.

SG3-These mandatory requirements shall designate specific qualities, procedures, materials, and performance criteria for which alternatives are permitted or for which provision is not made in Standard Specification ACI 503.1. Or exceptions shall be taken to Standard Specification ACI 503.1 if required.

SG4-A statement such as the following will serve to make Standard Specification ACI 503.1 an official part of the contract requirements:

The use of an epoxy adhesive for bonding hardened concrete, steel, wood, brick, and other materials to hardened concrete shall conform to all requirements of "Standard Specification for Bonding Hardened Concrete, Steel, Wood, Brick, and Other Materials to Hardened Concrete with a Multi-Component Epoxy Adhesive (ACI 503.1)," published by the American Concrete Institute, Detroit, Mich., except as modified by the requirements of this project specification.

SG5-The specification checklist that follows is addressed to each item of ACI 503.1 that requires the designer/specifier to make a choice where alternates are indicated, or to add provisions where they are not indicated in ACI 503.1, or to take exceptions to ACI 503.1. The checklist consists of section, part, and article heads of ACI 503.1, and accompanying notes to the designers/specifiers to indicate the action required of them.

SPECIFICATION CHECKLIST

Section/Part/Article of ACI 503.1	Notes to the Designer/Specifier
Section 1-General requirements	
1.1 Scope	Indicate specific scope.
1.4 Reference standards	Review applicability of cited references and take exceptions if required.
Section 2-Materials and applications	
Part 2.1-General	
2.1.2 Submittals	To whom sent?
2.1.3.2 Application control	To whom sent?
2.1.5 Project conditions	Specify any which would specifically affect this work.
Part 2.2-Products	
2.2.1 Epoxy adhesive	Specify Class and Grade as indicated. Also specify additional performance requirements and/or approved suppliers, as advisable.
Part 2.3-Execution	
2.3.1 Preparation of concrete surfaces	Specify limitations, if any, on use of mechanical abrasion and on disposal of waste products.
2.3.2 Preparation of carbon steel surfaces	If sand abrasive not suitable, specify grit or shot.
2.3.6.2 Moisture content of wood	A commercially available "probe" type moisture meter should be used except for plywood which will require a "flat plate" type with a depth of field suitable for plywood. For a durable adhesive bond to wood the wood should be sealed on all exposed sides to reduce absorption of moisture which will swell the wood and stress (to rupture) the wood fibers which are restrained by the cured adhesive.

SECTION 1-GENERAL REQUIREMENTS

1.1-Scope

1.1.1 This standard specification covers the bonding of hardened concrete, steel, wood, brick, and other materials to hardened concrete with a multi-component epoxy adhesive.

1.1.2 The provisions of this standard specification shall govern unless otherwise specified in the contract documents. In case of conflicting requirements, the contract documents shall govern.

1.2-Notation

- 1.2.1** ACI: American Concrete Institute
P.O. Box 19150
Detroit, MI 48219
- 1.2.2** ASTM: American Society for Testing and
Materials

- 1.2.3** SSPC: 1916 Race Street
Philadelphia, PA 19103
Steel Structures Painting Council
4400 Fifth Avenue
Pittsburgh, PA 15213

1.3-Specification wording

1.3.1 The language of this standard specification is generally imperative and terse, and may include incomplete sentences. Omissions of phrases and of words such as "the contractor shall," "in accordance with," "shall be," "as indicated," "a," "an," "the," "all," etc., are intentional. Omitted phrases and words shall be supplied by inference.

1.4-Reference standards

1.4.1 The standards referred to in this Standard Specification ACI 503.1 are listed in Articles 1.4.2 and 1.4.3