



AISI S902-17



**American
Iron and Steel
Institute**

AISI STANDARD

Test Standard for Determining the Effective Area of Cold-Formed Steel Compression Members

2017 Edition



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Approved by
the AISI Committee on Specifications for the Design of
Cold-Formed Steel Structural Members

The material contained herein has been developed by the American Iron and Steel Institute (AISI) Committee on Specifications for the Design of Cold-Formed Steel Structural Members. The organization and the Committee have made a diligent effort to present accurate, reliable, and useful information on testing of cold-formed steel members, components or structures. The Committee acknowledges and is grateful for the contributions of the numerous researchers, engineers, and others who have contributed to the body of knowledge on the subject. With anticipated improvements in understanding of the behavior of cold-formed steel and the continuing development of new technology, this material will become dated. It is anticipated that future editions of this test procedure will update this material as new information becomes available, but this cannot be guaranteed.

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PREFACE

The American Iron and Steel Institute Committee on Specifications developed this Standard to provide test methods for determining the effective cross-sectional area of cold-formed steel compression members.

The Committee acknowledges and is grateful for the contribution of the numerous engineers, researchers, producers and others who have contributed to the body of knowledge on this subject.

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of Cold-Formed Steel Structural Members**

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AISI S902-17**TEST STANDARD FOR DETERMINING THE
EFFECTIVE AREA OF COLD-FORMED STEEL COMPRESSION MEMBERS****1. Scope**

1.1 This Standard provides methods to determine the effective cross-sectional area of cold-formed steel compression members.

1.2 This Standard provides requirements for testing, and equations to determine the effective area of a cold-formed steel compression member section at ultimate load, A_{euN} , and the load- or stress-dependent effective area, A_e .

1.3 The Standard provides a means to observe, measure, and account for *local buckling* deformations when the appearance of a compression member section under stress must be determined.

1.4 The determination of A_e is conducted by either of the following methods:

- (1) The basic method provided in Sections 5 through 11, or
- (2) An alternative method provided in Appendix A.

2. Referenced Documents

The following documents or portions thereof are referenced within this Standard and shall be considered as part of the requirements of this document:

- a. American Iron and Steel Institute (AISI), Washington, DC:
S100-16, North American Specification for the Design of Cold-Formed Steel Structural Members
- b. ASTM International (ASTM), West Conshohocken, PA:
A370-16, Standard Test Methods and Definitions for Mechanical Testing of Steel Products
E6-15, Standard Terminology Relating to Methods of Mechanical Testing
IEEE/ASTM SI10-10, American National Standard for Metric Practice

3. Terminology

Where the following terms appear in this Standard, they shall have the meaning as defined herein. Terms not defined in Section 3 of this Standard, AISI S100 or ASTM E6 shall have the ordinary accepted meaning for the context for which they are intended.

Elements. Straight or curved portions of the cross-section of a compression member or *stub-column*.

Local Buckling. The *local buckling* mode of a flat *element* of a compression member cross-section, which influences the overall column-buckling behavior.

Overall Buckling. Buckling of a compression member as a function of its overall length.

Stub-Column. An axial compression member of the same cross-section and material as the compression member for which the strength needs to be determined, but short enough to preclude *overall column buckling*, if possible.