

American National Standard for Ladders – Portable Reinforced Plastic – Safety Requirements



American National Standards

American National Standard for Ladders – Portable Reinforced Plastic – Safety Requirements

Secretariat

American Ladder Institute

Approved December 12, 2017

American National Standards Institute, Inc.



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American National Standard

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Published by

American Ladder Institute
330 N. Wabash Avenue, Suite 2000, Chicago, IL 60611

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Printed in the United States of America

Foreword

(This Foreword is not a part of American National Standard A14.5-2017.)

This standard on reinforced plastic ladders is one of many American National Standards prepared under the supervision of ANSI Accredited Standards Committee on Safety in the Construction, Care, and Use of Ladders, A14. Subcommittees that report to American National Standards Committee A14 have developed all of the standards. The subcommittees are: A14.1, Portable Wood Ladders; A14.2, Portable Metal Ladders; A14.3, Fixed Ladders; A14.4, Job-Made Ladders; and A14.5, Portable Reinforced Plastic Ladders, and 14.9, Ceiling Mounted Disappearing Climbing Systems.

All standards, except A14.7, Mobile Ladders Stands and Mobile Ladder Stand Platforms, derive from the original American National Standard Safety Code for Construction, Care, and Use of Ladders, which was first approved on July 25, 1923. Revisions were approved in 1935, 1948, and 1952.

The earlier editions contained some treatment of metal and fixed ladders. Requirements for these types were removed from the 1948 revision because rapid development in the metal ladder field warranted special consideration and treatment of metal ladders and fixed ladders (usually metal) in separate standards.

The ensuing years saw the introduction of many new materials. The reinforced plastics and composite development efforts yielded man-made materials that offered advantages when employed in ladders. Initially, the performance test requirements given in American National Standard Safety Requirements for Portable Metal Ladders, A14.2, were used in the design and evaluation of reinforced plastic ladders.

The American Ladder Institute initiated a project that resulted in the development of the Fiberglass Ladder Material Specification, which was approved on October 6, 1971. Further revisions were approved on February 29, 1972 and October 4, 1972.

Concurrently, numerous requests were made to the American Ladder Institute and the American Mutual Insurance Alliance, as the Secretariat of ANSI-ASC A14, to develop an American National Standard on fiberglass ladders. Because of the significant use of reinforced plastic ladders, the recommendation was discussed at the May 23, 1972 meeting of American National Standards Committee A14. Subcommittee A14-5, Portable Reinforced Plastic Ladders, was created as a permanent subcommittee of ANSI-ASC A14 with instructions to develop a performance standard.

Subcommittee membership was solicited from a wide range of organizations representing consumers, manufacturers, and general interest areas. Technical specialists were included with expertise in material manufacture and testing of composite structures.

A preliminary draft was submitted to the A14-5 Subcommittee by the Fiberglass Code Committee of the American Ladder Institute on June 23, 1972. This was reviewed, and the first draft, dated November 1, 1972, was developed following the subcommittee meeting of September 7, 1972. The subcommittee met again on November 16, 1972, to review this draft, which resulted in a second draft. A letter ballot was submitted to the subcommittee membership with this draft soliciting approval.

A working task force from the subcommittee updated the draft to incorporate all relevant comments. The final draft was submitted to American National Standards Committee A14 on February 16, 1973, and was approved by the American National Standards Institute on June 20, 1974.

Responding to a Consumer Product Safety Commission challenge in August 1975, the A14 Committee mounted a three-prong attack to upgrade the portable ladder standards within the consensus framework of developing standards. Three Task Forces — Anthropometric, Testing, and Labeling — were established in October 1975.

Without question the most massive technically difficult task, which included a significant amount of human-factors work, was carried out by the Testing Task Force. Over 100 known ladder experts were solicited to join this task force and provide their technical expertise. The work involved 50 meetings, over 400 test documents, and the use of numerous test ladders over a period of nearly two years. The cost of the project has been conservatively estimated at over \$300,000.

At the August 11, 1977, joint meeting of the Testing Task Force and the A14 Advisory Committee, 23 procedures were presented. These procedures, with an accompanying rationale based upon statistical and human factors data, were distributed to the three portable-ladder subcommittees for review and incorporation into the standards. Recommendations for review and incorporation into the standards. Recommendations for nomenclature, and for care and use of ladders, as well as the Ladder Use Survey Form and Bi-Level Fall Victim Report Form that have been included in the Appendixes, had been previously balloted in order that this more technical material from the Testing Task Force would receive the full attention of the three subcommittees.

Test procedures were developed for three different applications, namely, design verification, quality control, and in-service testing. Design verification tests would generally be conducted on a one-time basis during the original design development of the product and would usually be destructive tests. Quality control tests would be conducted by the manufacturer on an on-going basis; some of the tests would be destructive and some would be nondestructive. In-service tests would be conducted by the user on a periodic basis and would be nondestructive in nature.

ANSI A14.2-1981 was approved March 4, 1980 with an effective date of March 4, 1982. This 2 year period was to allow the manufacturers the necessary lead time to evaluate their products for conformance to the 1981 edition of the three portable ladder standards, to redesign and test their products where applicable, to design and build the required manufacturing tooling and machinery, and to convert their manufacturing operations to produce the revised products.

During development of product for compliance with the 1981 revision, experience by some of the manufacturers indicated that the inclined load test was not practical when applied to all available length ladders. Also, recommendations were received for clarifications in test procedure descriptions. In the course of resolving these questions, evidence was produced to warrant modifications in the label test requirements and further investigations brought about changes in the label test specifications.

To allow time for investigating these issues, the effective date of the 1981 revision was postponed to June 4, 1982 and then to October 4, 1982. Once the issues were resolved, ANSI A14.2-1982 was approved with the needed changes incorporated and an effective date of October 4, 1982.

In the 1992 revision, several issues, which had arisen since the 1982 revision, were addressed. Most significantly, requirements were developed to cover the multipurpose articulated ladder. In addition the label/marketing section improved the graphics as well as presented new labels.

Considerable effort went into preparing the 2000 revision to assure consistency between the A14.2 standard for portable metal ladders and the new revisions of A14.1 (portable wood ladders) and A14.5 (portable reinforced plastic ladders) standards.

In the 2007 revision, as a result of efforts by an Articulated Ladder Task Force, additional dynamic testing has been added to the testing requirements for articulated ladders. Additionally, requirements for ladders with a 375 pound duty rating, designated as "Special Duty Type IAA" are now being incorporated within the ANSI A14.2 and A14.5 standards. Requirements for Special Duty Type IAA ladders were previously developed and issued in the ANSI A14.10-2000 standard. The A14.10 subcommittee was originally formed in order to quickly respond to a petition to ANSI by cable TV and electric companies for a higher duty-rating ladder. After incorporation of the Special Duty Type IAA requirements into the A14.2 and A14.5 standards, the A14.10 standard will be withdrawn.

In this current revision, as a result of further efforts by the Articulated Ladder Task Force, additional specifications and testing requirements are being added to the standard for articulated extendable ladders. Additionally, a generic plywood test surface was adopted for those tests requiring a specific floor surface or top support for the ladder. The Labeling/Marking Task Force has provided revised non-mandatory labeling illustrations in Appendix A and B that incorporate the ANSI Z535.4 guidelines with the long standing labeling practices of ANSI ASC A14. The format of the standard has been modified to place all tables and figures at the end.

Each revision of the standard was processed and approved for submittal to ANSI by American National Standards Committee on Safety in the Construction, Care, and Use of Ladders, A14. Committee approval of the standard does not necessarily imply that all the committee members voted for its approval.

Suggestions for improvement of this standard are welcome. They should be sent to the American Ladder Institute, 330 N. Wabash Ave., Suite 2000, Chicago, IL 60611.

At the time it approved this standard, the A14 Committee had the following members:

Organization Represented	Name of Representative
American Insurance Association	George Earhart
American Ladder Institute	Ron Schwartz
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American Society of Safety Engineers	Michael Lorenzo
	Tim Fisher (Alt)
Associated General Contractors of America	Charles E. Bird
	Tim Fischer (Alt)
Canadian Standards Association	Dave Shanahan
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	Larry Voris (Alt)
Cotterman Company	Don Gibson
	Pete Catlos (Alt)
Ellis Fall Safety Solutions, LLC Div. of DSC	J. Nigel Ellis
	Cody Snyder (Alt)
Grainger Industrial Supply	Richard Martin
	John Foston (Alt)
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International Union of Painters and Allied Trades	Greg Renne
	Dan Penski (Alt)
International Union of Bricklayers & Allied Craftworkers	Gerald Scarano
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	Robert Matuga (Alt)
National Frame Builders Association	Stan Virkler
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	Robert G. Stuligross (Alt)
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State University of New York	George H. Kyanka
Steel Plate Fabricators Association	Ken Wade
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	Kristopher Selgua (Alt)
Tri-Arc Manufacturing Co., Inc.	Ron Schwartz
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Noa W. Pedersen (Alt)
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Dr. George H. Kyanka
Dr. Irving Ojalvo

*non-voting advisory member

Subcommittee A14-5 on portable ladders, which revised this standard, consists of the following members:

Mike Van Bree, Chair	
Erick Knox	Thomas Schmitt
Dave Plotner	Carrie White

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American National Standard for Ladders – Portable Reinforced Plastic – Safety Requirements

1. Scope and Purpose

1.1 Scope

This standard prescribes rules governing the safe construction, design, testing, care and use of portable reinforced plastic ladders of various Types and styles. Ladder Types included are:

Duty Rating	Ladder Type	Working Load (pounds)
Special Duty	IAA	375
Extra Heavy-Duty	IA	300
Heavy-Duty	I	250
Medium-Duty	II	225
Light-Duty	III	200

Ladder styles include ladder type step stools, portable extension, step, trestle, sectional, combination, single, platform, articulating, and articulating extendable ladders, but excluding ladders in and on mines, the fire services, mobile equipment, hoisting equipment, work platforms, antenna communications towers, transmission towers, utility poles, and chimneys. It does not cover special-purpose ladders that do not meet the general requirements of this standard, nor does it cover ladder accessories, including, but not limited to, ladder levelers, ladder stabilizers or stand-off devices, ladder jacks, or ladder straps or hooks, that may be installed on or used in conjunction with ladders.

Note: Ladder type step stools are covered by A14.5. It is recognized that a step stool standard is under development. When the step stool standard (A14.11) becomes effective, A14.5 will no longer cover ladder type step stools.

These requirements are also intended to prescribe rules and criteria for labeling/marketing of the kinds of portable ladders cited in this standard, but exclusive of furniture type step stools and special purpose ladders. These labeling/marketing requirements do not apply to those situations where training, supervision, or documented safety procedures would be in conflict, or serve in lieu of, these labeling/marketing requirements.

1.2 Purpose

The purpose of this standard is to provide reasonable safety for life, limb, and property. In order to develop an effective safety program, the standard may serve also as a basis for purchase requirements and for instructions in personnel training, and in the preparation of motivational/instructional material such as safety practices, manuals, posters, and the like.

This standard is also intended to provide the manufacturer, purchaser, and user of reinforced plastic ladders with a set of performance and dimensional requirements against which a product may be compared. It is not the purpose of this standard to specify all the details of construction of portable reinforced plastic ladders. The limitations imposed are for the purpose of providing adequate general requirements and testing methods needed for consistency.