

American National Standard for

MAST-CLIMBING WORK PLATFORMS

PREVIEW ONLY

Page Intentionally Left Blank

ANSI/SAIA A92.9-2023

Date of Publication: March 1, 2023

This Standard will become effective: March 1, 2024

This Standard was approved by the American National Standards Institute: February 6, 2023

The effective date is established by the standards developer and not by the American National Standards Institute. This Standard was developed under procedures accredited as meeting the criteria for American National Standards (ANS). The Consensus Committee that approved the Standard was balanced to assure that individuals from competent and concerned interests have had an opportunity to participate. The proposed Standard was made available for public review and comment which provides an opportunity for additional public input from industry, academia, regulatory agencies, and the public at large.

The Scaffold & Access Industry Association, Inc. (SAIA) does not “approve,” “rate,” or “endorse” any item, construction, proprietary device or activity.

The Scaffold & Access Industry Association, Inc. (SAIA) does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document and does not undertake to ensure anyone utilizing a standard against liability for infringement of any applicable Letters Patent, nor assume any such liability. Users of this Standard are expressly advised that the determination of the validity of any such patent rights, and the risk of the infringement of such rights, is entirely their own responsibility.

Participation by federal agency representative(s) or person(s) affiliated within the industry is not to be interpreted as government or industry endorsement of this standard.

The Scaffold & Access Industry Association, Inc. (SAIA) accepts responsibility for only those interpretations issued in accordance with governing ANSI Essential Requirements which preclude the issuance of interpretations by individual volunteers.

**ANSI/SAIA
A92.9-2023**

**AMERICAN NATIONAL STANDARD
for Mast-Climbing Work Platforms**

PREVIEW ONLY

**Secretariat
Scaffold & Access Industry Association, Inc.**

**Approved: February 6, 2023
American National Standards Institute, Inc.**

This document is copyright protected and may not be reproduced or distributed to any other party.

American National Standard

Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgment of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made toward their resolution.

The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, or procedures not conforming to the standards.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

CAUTION NOTICE: This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken to reaffirm, revise, or withdraw this standard no later than five years from the date of approval. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

Published by

Scaffold & Access Industry Association Inc.
400 Admiral Boulevard Kansas City, MO 64106
816.595.4860 • www.saiaonline.org

Copyright ©2022 by the Scaffold & Access Industry Association Inc.
All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Printed in the United States of America

Foreword

This foreword is not part of American National Standard for A92.9-2023.

This standard is one of a series on aerial platforms developed under the committee procedures of the American National Standards Institute. The A92 standards committee was organized by the Institute in 1948. The Scaffold & Access Industry Association, Inc. serves as Secretariat.

The primary objective of this standard is to prevent accidents associated with the use of Mast-Climbing Work Platforms by establishing requirements for design manufacture, installation, maintenance, performance, use and training.

Interpretations and Suggestions for Improvement

All inquiries requesting an interpretation of the Committee's approved American National Standards shall be in writing and directed to the Secretariat. The A92 Committee shall approve the interpretation before submission to the inquirer. No one but the A92 Committee is authorized to provide any interpretation of this standard.

All requests for interpretation and all suggestions for improvement shall be forwarded in writing to the ASC A92 Committee, c/o Secretariat ~ Scaffold & Access Industry Association, 400 Admiral Boulevard, Kansas City, MO 64106.

The A92 Committee solicits comments on and criticism of the requirements of the standards. The standards will be revised from time to time when necessary or desirable, as demonstrated by the experience gained from the application of the standards. Proposals for improvement of this standard will be welcome. Proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed rationale for the proposal including any pertinent documentation.

This Standard was processed and approved for submittal to ANSI by Accredited Standards Committee A92 - Aerial Platforms. The ASC A92 Main Committee's approval of the standard does not necessarily imply that all committee members voted for its approval. At the time the ASC A92 committee approved this standard, the A92 - Aerial Platforms Committee had the following members:

Joshua Chard, Ph.D., Chairman
Frank Bonesteel, Vice-Chairman
DeAnna Martin, Secretary

Alimak Group USA, Inc.	Gregory Janda/Tony Dragone
Altec Industries Inc.	Bryan Hall/Robert Crowder
Altec Neuco.....	Butch Barron/Eric Lumberg
American Rental Association	John McClelland/Kevin Gern
Arrowhead Aerial Products, Inc	Sharon McCarty
Arrowhead Product Development, Inc.....	Gary Werkhoven
Aspen Aerials, Inc.	Patrick Clark/Justin Laskowski
Association of Equipment Manufacturers (AEM)	Jeff Jurgens
Beta Max Inc.	Dave Reinert
Blazing Technologies	Robert Backer
Blue & White Product Safety Consultants.....	Stephen Forgas
Bonesteel Construction Company	Frank Bonesteel
BrandSafway.....	Don Allen
Brent Hoover LLC.....	Brent Hoover

Brewington & Company	John Brewington
CED Technologies, Inc.	George Wharton
Century Elevators	Eric Schmidt, P.E.
CPWR The Center for Construction Research and Training	Michael Kassman/Gary Gustafson
Diversified Inspections/ ITL	Jerry Tanner/Ralph Goodwin
Duke Energy Carolina East.....	David Benson/Sammy Nifong
Duke Energy Florida	Donald Barrows
Dur-A-Lift Inc.	Douglas Brinkhous
Eckstine and Associates, Inc.	Dennis Eckstine/Matthew Eckstine
Elliott Equipment Company	Alan Calta/Matt Gill
Entergy Services, LLC	Carey Stallings
EPRO Safety Solutions	Albert Eccles
Evulich & Associates	Barris Evulich
ExxonMobil	Frank Radio
EZ Scaffold	James Hinton
Florida Power and Light Company	Glenn Martin
Fraco Products Ltd.	Francois Villeneuve/Shanon Beekman
GB MEWP Consulting, LLC.	Carl Kishline
Genie Industries	Jason Berry/Harrison Jenkins
Global Rentals.....	Joshua Chard, Ph.D.
Global Safety & Equipment Inc.	Geoffrey Arther
H&E Equipment Services, Inc.	Frankie Wynn
Haulotte Group	Kevin Gildea, PE
Heath and Associates	Frederick Heath
Helix Electrix	Christopher Hughes/Eric Simmons
Herc Rentals.....	Jordan W. Thomas
Hubbell Power Systems, Inc.	Dustin Sullivan
Hugg & Hall Equipment.....	Bob Hendricks
Hy-Brid Lifts/ Custom Equipment	Ben Froland
Hydro Mobile Inc.	Kevin O'Shea/Sony Trudel
IBEW Local 164.....	Michael DeGiglio
International Masonry Institute (IMI)	David Wysocki/Donald Borchert
IPAF, Ltd.	Tony Groat/Dan Moss
IREX Contracting Group	Tom Pokornik
IVES Training & Compliance Group Inc.	Robert Vetter
JLG Industries Inc.	Mark Vaughn/Devin Mellott
KHL Group/Access, Lift & Handlers Magazine	Tony Radke
Klimer Platforms Inc.	James Gordon/Ihton Frederick
Lee Electrical Construction Inc.	John Cook/Jason Lee
Lewis Tree Service	Samuel Luna
Lift-A-Loft Corporation.....	Doug Jeurissen
Lynn Ladder & Scaffolding	Michael Naglieri
McClain & Co., Inc.	Daniel McClain
MEC Aerial Work Platforms	Gary Crook/Mark Kroeker
MEWPs Inc.	Richard Staples/Scott Loura
ML Cranes & Equipment	Mickey Hodges
Moog USA Inc.	Martin Schweizer/Cindy Watson
Niftylift Inc.	Steven Redding/James Clare
OEM Controls, Inc	Paul Rohaly/Robert Wuertz
Palfinger North America, LLC	Bobby Taylor/Will Urban
Phenix Technologies	Mark Miller

Pike Electric, LLC	Andy Cleary/Kevin Watson
Piranha Safety	Eric Moran/Homer Kyle
Power Equipment Leasing Co, Inc	Tracy Schroeder/Kyle Schroeder
ReechCraft Inc.	Jason Solhjem/Shane Nickel
Reynolds Engineering Services Inc.....	Stephen Reynolds
RLH Consulting LLC.....	Richard Hoffelmeyer
Salt River Project (SRP)	Brendan King/Jason Kleiber
SEA, LTD.....	Brian Boggess
Skanska USA Building	Spencer Hasenkopf
Skyjack Inc.	Ian McGregor/Diego Cardenas
Snorkel International LLC	Jeff Eckhardt, P.E./Tony Deatherage
Southern California Edison	Randy Stone
Southern Company - Alabama Power Company	Herman Scott/Jenny Taylor
Sunbelt Rentals.....	Brian Clark
Sunstate Equipment Co.....	Jake Kidd
Superior Scaffold Services Inc.	Shawn MacDonald
Technology International Co.....	Michael Zhou
Terex South Dakota, Inc.	Dan Brenden/Craig Ries
Terex Utilities, Inc.	Nick Cammisa/David Sexton
TESCO Equipment LLC.	Alan Wagamon
THD Rental	Donald Satterfield
The Boeing Company	Matthew Hastings
The Townsend Corporation	Mark Kimbrough
The VON Corporation.....	Martin von Herrmann
Time Manufacturing Company	James Christian/Brian Davis
TNT Equipment Co.....	Michael Solomon
Tower Safety & Instruction.....	Kathy Gill
TrainMOR / Morrison Industrial Equipment.....	Scott Ahner
Tutus LLC	Forrest Hester
United Rentals.....	Teresa Kee/Russ Jeansonne
Utility Truck Equipment & Parts LLC	John Mlaker
Vollmer-Gray Engineering	Paul Guthorn
Waco Boom Company Ltd.....	Jonathan Woods/Bob Simon
Wiss, Janney, Elstner Associates Inc.....	Jason Kamman
Xtreme Manufacturing	Jake Adkins/Jonathan Rasa
Zachry Group	Randy Alanis

Subcommittee A92.9 Standards for Mast-Climbing Work Platforms, which developed this standard, had the following members:

Don Allen	Sam Ingber	Eric Schmidt
Shanon Beekman	Gregory Janda	Jason Solhjem
Ted Beville	Michael Kassman	Michael Solomon
Donald Borchert	Shawn MacDonald	Pam Susi
Ihton Frederick	Daniel J (Dan) Moss	Sony Trudel
James Gordon	Michael Naglieri	Francois Villeneuve
Bernard (Barney) Hanna	Kevin O'Shea	David Wysocki
James Hinton	David Reinert	

Contents Section	Page
1.Scope	1
1.4 Effective Date.....	1
1.7 Equipment Not Covered.....	2
2.References and Related Standards.....	3
3.Definitions.....	4
4.List of Hazards	11
5.Safety Requirements and/or Measures	14
5.1 Structural and Stability Calculations.....	14
5.1.1 General	14
5.1.2 Loads and Forces	14
5.1.3 Load Combinations and Safety Factor.....	19
5.1.4 Structural Calculations.....	21
5.1.5 Stability Calculations.....	21
5.2 General Machine Requirements, Base Frame, Chassis and Mast.....	22
5.2.1 General Machine Requirements.....	22
5.2.2 Base Frame and Chassis.....	23
5.2.3 Mast Structure	25
5.2.4 Mast Design with regard to Erection	25
5.2.5 Mast Tie.....	25
5.3 Work Platform.....	26
5.3.1 General	26
5.3.2 Guarding.....	27
5.3.3 Access	28
5.3.4 Multilevel Work Platforms.....	28
5.4 Drive Systems for Elevation	29
5.4.1 General	29
5.4.2 Rack and Pinion Drive System.....	30
5.4.3 Ratchet Drive Systems.....	31
5.4.4 Screw Drive Systems	33
5.4.5 Braking System.....	34
5.4.6 Buffers	35
5.5 Means to Prevent the Work Platform from Falling with Overspeed	36
5.5.1 General	36
5.5.2 Overspeed Safety Device	36
5.5.3 Multiple Drive Units	37
5.6 Means for Emergency Lowering and Raising the Work Platform	38
5.7 Overload/Moment Device	39
5.8 Electrical Systems.....	41
5.8.1 General	41
5.8.2 Safety Switches.....	42
5.8.3 Control Systems	42
5.9 Drive Systems Powered by Internal Combustion Engines	42
5.10 Hydraulic Systems.....	43
5.10.1 General	43
5.10.2 Hydraulic Cylinders.....	44
5.11 Special Requirements for Safety Devices That Depend on Auxiliary Circuits.....	44
5.12 Travel Limit Switches.....	45
5.13 Controls	46
6 Verification of Safety Requirements And/or Measures for Each New Model of MCWP	47
6.1 Design Check.....	47

6.2 Practical Tests	47
6.2.1 General	47
6.2.2 Stability Tests.....	47
7 Information for Use	49
7.1 Operating Manual.....	49
7.1.2 Content of the Operating Manual	49
7.2 Marking	54
7.2.1 General	54
7.2.2 Information, Non Varying.....	55
7.2.3 Information, Varying.....	55
7.3 Responsibilities of Dealers	56
7.4 Responsibilities of Owners	58
7.5 Responsibilities of Users	62
7.6 Responsibilities of Operators	68
7.7 Responsibilities of Lessors	73
7.8 Responsibilities of Lessees	74
7.9 Responsibilities of Brokers.....	74
Annex A Informative for Structural Calculations	75
Annex B Special Requirements for Multilevel Work Platforms	77
Annex C Requirements for Electrical and Electronic Aspects for Overload Detection Devices	79
Annex D Minimum Approach Distance	82

American National Standard for Mast-Climbing Work Platforms

1. Scope

This standard applies to Mast Climbing Work Platforms that are primarily used to position personnel, along with their necessary tools and materials, to perform their work. (See Figures 1 and 2 on the following pages for typical examples of equipment covered.) Platforms may be adjustable by manual or powered means.

1.1

This standard is applicable to work platforms which are elevated by a drive system and guided by and move along their supporting masts, where the mast may or may not require lateral restraint from separate supporting structures.

1.2

This standard is applicable to any combination of the following alternatives:

- a) one or more masts.
- b) mast tied or untied.
- c) mast of fixed or variable length.
- d) masts vertical or inclined between 0° and 30° to the vertical.
- e) masts which are standing or hanging.
- f) movable or static base (chassis, or base frame).
- g) manually or power-operated elevation.
- h) towed or self-powered ground travel on site, excluding road traffic regulation requirements.
- i) driven using electric, pneumatic, hydraulic motors, or internal combustion engines.

1.3

This standard identifies the hazards arising during the various phases in the life of such equipment and describes methods for the elimination or reduction of these hazards and for the use of safe working practices.

1.4 Effective Dates

The design and manufacturing requirements of this standard apply to all mast-climbing work platforms manufactured on or after the effective date of this standard. All other provisions of this standard apply to both new and existing units delivered by sale, lease, rental, or for any form of beneficial use on or after the effective date.

1.4.1 Design, manufacture and remanufacture requirements

The design and manufacturing requirements of this Standard will apply to all Mast Climbing Work Platforms (MCWPs) manufactured on or after the effective date. MCWPs remanufactured on or after the effective date of this Standard shall comply with the requirements of this Standard.

1.4.2 Rebuild / recondition requirements

Rebuilt / reconditioned MCWPs shall comply with the Standard in effect as of the date of their original manufacture.