

ASME A17.1-2022/CSA B44:22

(Revision of ASME A17.1-2019/CSA B44:19)

Safety Code for Elevators and Escalators

**Includes Requirements for Elevators,
Escalators, Dumbwaiters, Moving
Walks, Material Lifts, and Dumbwaiters
With Automatic Transfer Devices**

AN AMERICAN NATIONAL STANDARD



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ASME FOREWORD

(22)

The first edition of this Code was published in January 1921. It was prepared by an American Society of Mechanical Engineers (ASME) Committee on Protection of Industrial Workers with the assistance of representatives of a number of interests including manufacturers, insurance carriers, regulatory bodies, and technical societies.

Subsequently, ASME requested the American Engineering Standards Committee (AESC) to authorize the organization of a Sectional Committee to undertake a revision. The AESC acted favorably on this request and in January 1922 assigned sponsorship for the project jointly to the American Institute of Architects, the National Bureau of Standards, and ASME, all three of whom had taken an active part in the preparation of the first edition of the Code.

The organizational meeting of the Sectional Committee A17 was held in November 1922. A number of meetings of the Committee were held during the next two years, and in July 1925, a revision of the 1921 Code was completed, approved by the AESC, and published as an American Standard.

Subsequent to the publication of the 1925 revision of the Code, the necessity for development research on the design and construction of car safeties and oil buffers and for the development of test specifications for various parts of elevator equipment was realized.

As a result, a Subcommittee on Research, Recommendations, and Interpretations was appointed in 1926. This subcommittee held regular meetings thereafter until interrupted by the Second World War in 1940, and carried on an extensive test program at the National Bureau of Standards in connection with oil buffers and car safeties. Subsequent to the war, the name of this subcommittee was changed to "Executive Committee for the Elevator Safety Code."

The information gained as a result of these tests, together with the developments that had occurred in the design of the equipment as a result of installations made in very tall buildings, prompted the Sectional Committee to prepare and issue the third edition of the Code in 1931. The third edition was approved by the Sectional Committee in February 1931, and subsequently by the sponsors and by the American Standards Association (ASA, formerly the AESC) in July 1931.

Further experience and developments in the design of elevator equipment led the Sectional Committee, in line with its policy of revising the Code periodically, to prepare the fourth edition in 1937, which was approved by the sponsors and by the ASA in July 1937.

A fifth edition of the Code was well under way in 1940 when it was necessary to suspend the work due to the Second World War. However, a number of the revisions already agreed upon by the Sectional Committee and approved by the sponsors and by the ASA in April 1942 were issued as a supplement to the 1937 edition. They were subsequently incorporated in a reprint of the 1937 edition in 1945. In response to public demand, requirements for private residence elevators were also issued in a separate supplement, ASA A17.1.5-1953, and incorporated into the Code as Part V in the 1955 edition.

The Sectional Committee reinitiated consideration of the fifth edition of the Code in 1946. Due to the considerable period that had elapsed since the fourth revision in 1937, and to the very extensive developments in the elevator art, the Committee decided that the Code should be completely rewritten and brought up to date.

Special subcommittees were appointed to prepare the revisions of the various requirements. The membership of each subcommittee consisted of persons especially familiar with the requirements to be covered by that subcommittee. Fifteen subcommittees were set up with a total membership of over 150 persons. The membership of these subcommittees was not confined to members of the Sectional Committee. It also included other persons having expert knowledge of the subjects under consideration by the subcommittees. These subcommittees and their personnel were listed in the 1955 edition of the Code.

The drafts prepared by these subcommittees were widely circulated to interested groups for comment. After review of the comments and correlation of the drafts, the fifth edition of the Code was approved by the Sectional Committee, subsequently by the sponsors, and by the ASA in June 1955.

In December 1957, a Supplement to the Code listing a number of revisions was approved by the ASA and published by ASME.

A sixth edition was published in 1960 that incorporated the revisions contained in the 1957 Supplement as well as approximately 96 revisions that were approved by the Sectional Committee in March 1960.

In 1958 the scope of the A17 Code was enlarged to include moving walks. The membership of the Sectional Committee was expanded to include manufacturers whose primary interest in the Committee was the development of rules and regulations on moving walks. A subcommittee prepared a Safety Code for Moving Walks, which was approved by the

Sectional Committee, the sponsors, and by the ASA on March 20, 1962. This Code was published as Part XIII of the A17.1 Code, and was designated ASA A17.1.13-1962.

During 1962 and 1963, 38 additional changes to Parts I through XII of ASA A17.1 were approved by the Sectional Committee and the sponsors, and the ASA, and were published as the 1963 Supplement to the 1960 edition of the Code.

A seventh edition was published in 1965 that incorporated the rules of the Safety Code for Moving Walks, ASA A17.1.13-1962, as Part XIII, the revisions covered by the 1963 Supplement, and approximately 90 other revisions approved by the Sectional Committee, the sponsors, and the ASA. The title of the Code was also changed to the American Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks.

On August 24, 1966, the ASA was reconstituted as the United States of America Standards Institute. The designation of standards approved as American Standards was changed to USA Standards. There was no change in the index identification or the technical content of the standards. At the same time, the ASA Sectional Committee, A17 on A Safety Code for Elevators, was changed to the USA Standards Committee, A17 on A Safety Code for Elevators. Four supplements to the seventh edition were published from 1967 through 1970.

The United States of America Standards Institute changed its name to American National Standards Institute, Inc. (ANSI) on October 6, 1969. At the time that the new name became effective, the designation USA Standard was changed to American National Standard and the names of committees changed from USA Standards Committees to American National Standards Committees. The alphabetical designation of standard documents was changed from USA to ANSI.

The eighth edition of the Code (1971) incorporated the revisions covered by the four supplements and an additional 94 revisions. Seven supplements were issued from 1972 through 1976. Part XIV covering material lifts and dumbwaiters with automatic transfer devices was added in supplement ANSI A17.1d-1975.

The ninth edition of the Code (1978) incorporated 75 revisions in addition to those covered by the previous supplements. Part XV covering special purpose personnel elevators was added and the reference codes, standards, and specifications were moved from the Preface to a new Part XVI. Two supplements to this edition were issued in 1979 and 1980.

The tenth edition of the Code (1981) incorporated the revisions covered by Supplements ANSI A17.1a-1979 and ANSI A17.1b-1980, as well as the following new material: Part XVII, Inclined Elevators; Appendix F, Seismic Regulations; and Appendix G, Recommended Practice for Accelerating Moving Walks. Rule 211.3 and Part V were also completely revised, with the private residence inclined lifts moved to Part XVIII. Numerous other revisions and additions that had been approved since the time of the 1980 supplement were also included.

The tenth edition of the Code was approved by the A17 Standards Committee. After publication of the tenth edition, the Committee was reorganized in accordance with the ANSI Accredited Organization Method under the sponsorship of ASME. With this reorganization, the National Bureau of Standards and the American Institute of Architects relinquished their roles as cosecretariats. The Standards, Conference, and Executive Committees were also restructured as the Main Committee and the National Interest Review Committee, with the Working Committees (subcommittees) continuing to operate as before.

This reorganization also prompted a change in the title of the Code to the ANSI/ASME A17.1 Safety Code for Elevators and Escalators. The title was shortened for convenience, and it should not be construed that the Code no longer covered dumbwaiters, moving walks, or the other equipment included within the Scope of the Code.

Two supplements to the 1981 edition were issued: ANSI/ASME A17.1a-1982 and ANSI/ASME A17.1b-1983. The 1982 supplement included a new Part XIX covering elevators used for construction. In the 1983 supplement, the requirements for private residence inclined lifts in Part XVIII were expanded and incorporated into a new Part XXI covering private residence inclined stairway chairlifts and inclined and vertical wheelchair lifts. Part XX was added to cover these same devices installed in buildings other than private residences. Requirements for screw-column elevators were also added and designated as Part XVIII.

The eleventh edition of the Code (1984) incorporated the changes made in the 1982 and 1983 supplements, as well as additional revisions.

The eleventh edition was updated with five supplements, which were issued approximately every 6 months from 1985 through the spring of 1987. Appendix I (later redesignated as Appendix E) was added in ANSI/ASME A17.1a-1985. Requirements for rack-and-pinion elevators were added in ANSI/ASME A17.1c-1986, designated as Part XVI. The previous Part XVI (Reference Codes, Standards, and Specifications) was moved to Section 4 of the Introduction. In ANSI/ASME A17.1d-1986, the requirements for sidewalk elevators in Part IV, and alterations in Part XII, were completely revised.

The twelfth edition of the Code incorporated the changes made in supplements ANSI/ASME A17.1a-1985 through ANSI/ASME A17.1e-1987, as well as additional revisions. Among these changes was a complete revision of the requirements for dumbwaiters in Part VII. The format of the Code was also changed editorially to incorporate Exceptions into the body of the Rules.

The thirteenth edition of the Code incorporated the changes made in ANSI/ASME A17.1a-1988 and ANSI/ASME A17.1b-1989 as well as additional revisions. Part XXII, Shipboard Elevators, was added in ANSI/ASME A17.1b-1989. Part XXIII, Rooftop Elevators, appeared for the first time in the thirteenth edition.

The fourteenth edition of the Code incorporated the changes made in ASME A17.1a-1991 and ASME A17.1b-1992 as well as additional revisions. Safety requirements for seismic risk zone 3 and greater were moved from Appendix F into new Part XXIV, Elevator Safety Requirements for Seismic Risk Zone 2 or Greater. Requirements for seismic risk zone 2 were added to Part XXIV.

The fifteenth edition of the Code incorporated the changes made in ASME A17.1a-1994 and ASME A17.1b-1995 as well as additional revisions. Part XXV, Limited-Use/Limited-Application Elevators, was added in ASME A17.1b-1995. The rules in Part III were harmonized with CAN/CSA B44, Elevator Safety Standard, Sections 4 and 11, and Appendix G4.

The sixteenth edition of the Code incorporated changes made in ASME A17.1a-1997 through ASME A17.1d-2000. Requirements for mine elevators were also added in Section 5.9 of this edition. In addition, the entire Code was reformatted to incorporate a decimal numbering system. For the sixteenth edition of the Code, cross-reference tables were provided to facilitate the correlation between requirements from the fifteenth edition of the Code and the renumbered requirements of the sixteenth edition and vice versa. The sixteenth edition of ASME A17.1 was the result of a joint effort between the ASME A17 Elevator and Escalator Committee and the Canadian Standards Association (CSA) B44 Technical Committee to harmonize requirements between ASME A17.1, Safety Code for Elevators and Escalators, and CSA B44, Safety Code for Elevators.

The seventeenth edition of the Code incorporated changes made in ASME A17.1a-2002 and ASME A17.1b-2003. Additionally, in Sections 8.10 and 8.11, cross-references were updated to reflect ASME A17.2-2001, Guide for Inspection of Elevators, Escalators, and Moving Walks.

The eighteenth edition of the Code was a fully binational standard. All former deviations between the ASME A17.1 Code and the CSA B44 Code were fully addressed within this one Code. Additionally, this edition incorporated revisions to address the advancement of technologies used in the design and construction of elevator equipment that had enabled the installation of the equipment in other than traditional locations, such as machine rooms. New requirements were also added to address programmable electronic systems in safety-related applications of elevators.

The nineteenth edition of the Code incorporated changes made in ASME A17.1a-2008/CSA B44a-08 and ASME A17.1b-2009/CSA B44b-09. Major changes included former periodic inspections now being covered under maintenance requirements. New requirements were added to address the means and members of suspension, compensation, and governor systems for elevators. These new requirements were covered in detail through reference to ASME A17.6, which includes the material properties, design, testing, inspection, and replacement criteria for these means. It includes the requirements for steel wire rope, aramid fiber rope, and noncircular elastomeric-coated steel suspension members and provides direction for future constructions as new technology develops.

The twentieth edition of the Code contained well over one hundred revisions made to existing requirements, as well as some new requirements.

New requirements were added to address new types of elevator equipment being used in the industry, specifically wind turbine elevators and outside emergency elevators. In addition, requirements were added to address a new feature called Elevator Evacuation Operation (EEO), which allows for the use of elevators for occupant evacuation.

Besides the above, major changes included the following:

(a) The seismic requirements of the Code were revised to include seismic force levels as specified in the latest building codes in the United States (IBC) and Canada (NBCC). To facilitate incorporation of these requirements, ASME published Technical Report A17.1-8.4, Guide for Elevator Seismic Design.

(b) Requirements related to the maintenance control program were updated to improve clarity and organization for records, content, availability, and format.

(c) Regarding qualifications for elevator inspectors (QEI), effective January 1, 2014, accreditation of organizations that certify elevator inspectors and inspection supervisors was discontinued by ASME. Requirements were revised in this area to allow for accreditation to be done by other organizations.

The twenty-first edition of the Code contained many revisions to existing requirements and the addition of some new requirements. Some areas of note, in which significant updates were made, include, but are not limited to, seismic requirements for escalators; requirements for special purpose personnel elevators, rack-and-pinion elevators, private residence elevators, and material lifts with obscured transfer devices; and the addition of elastomeric buffer requirements. In addition, the requirements in Section 5.11, Wind Turbine Tower Elevators, are now addressed within ASME A17.8/CSA B44.8, and Section 7.11 on material lifts with obscured transfer devices was removed. Additionally, Nonmandatory Appendix T on inspection and replacement of steel wire ropes and Nonmandatory Appendix W on wind turbine tower elevator clearances were removed.

The twenty-second edition of the Code included many revisions, including additional updates for door requirements in private residence elevators, occupant evacuation elevators, and clarifications of seismic requirements for elevators and escalators. In addition, some key revisions of note were the updating of emergency communication requirements for an elevator to ensure communication with any trapped passengers, including those that are hearing impaired, and additional requirements modified for increased door protection on passenger elevators.

This twenty-third edition of the Code contains many revisions, including the addition of cybersecurity requirements, remote interaction operation requirements, and test enable operation requirements. In addition, many requirements have been updated, including flood protection of elevators, alternate testing of emergency braking, and door position monitoring on Phase II.

The following is a complete list of editions and supplements to the Code that have been published and the dates when they received final approval. The dates of issuance are also included for the documents published since 1974, and the dates on which they became effective are included for those published since 1978.

	Editions and Supplements	Approved	Issued	Effective
First Edition	1921	January 1921	...	...
Second Edition	A17-1925	April 1925	...	...
Third Edition	ASA A17-1931	July 1931	...	...
Fourth Edition Supplements	ASA A17.1-1937 ASA A17.3-1942 ASA A17.1.5-1953	July 1937 April 1942 June 9, 1953	.........	.........
Fifth Edition Supplements	ASA A17.1-1955 ASA A17.1a-1957	June 15, 1955 December 10, 1957	......	......
Sixth Edition Supplements	ASA A17.1-1960 ASA A17.1.13-1962 ASA A17.1a-1963	August 29, 1960 March 20, 1962 August 16, 1963	.........	.........
Seventh Edition Supplements	ASA A17.1-1965 USAS A17.1a-1967 USAS A17.1b-1968 USAS A17.1c-1969 ANSI A17.1d-1970	July 29, 1965 July 7, 1967 December 11, 1968 May 6, 1969 March 2, 1970	...............	...............
Eighth Edition Supplements	ANSI A17.1-1971 ANSI A17.1a-1972 ANSI A17.1b-1973 ANSI A17.1c-1974 ANSI A17.1d-1975 ANSI A17.1e-1975 ANSI A17.1f-1975 ANSI A17.1g-1976	July 27, 1971 February 16, 1972 October 11, 1973 April 26, 1974 February 26, 1975 March 26, 1975 April 2, 1975 August 12, 1976	... ... ... September 15, 1974 October 31, 1975 October 31, 1975 October 31, 1975 November 30, 1976	........................
Ninth Edition Supplements	ANSI A17.1-1978 ANSI A17.1a-1979 ANSI A17.1b-1980	May 4, 1978 February 5, 1979 March 20, 1980	June 15, 1978 March 30, 1979 May 15, 1980	September 15, 1978 June 30, 1979 August 15, 1980
Tenth Edition Supplements	ANSI/ASME A17.1-1981 ANSI/ASME A17.1a-1982 ANSI/ASME A17.1b-1983	September 8, 1981 October 5, 1982 October 24, 1983	October 22, 1981 November 30, 1982 December 23, 1983	April 22, 1982 May 30, 1983 June 23, 1984
Eleventh Edition Supplements	ANSI/ASME A17.1-1984 ANSI/ASME A17.1a-1985 ANSI/ASME A17.1b-1985 ANSI/ASME A17.1c-1986 ANSI/ASME A17.1d-1986 ANSI/ASME A17.1e-1987	August 16, 1984 February 27, 1985 August 6, 1985 March 5, 1986 September 8, 1986 February 18, 1987	September 16, 1984 April 15, 1985 October 15, 1985 April 30, 1986 November 30, 1986 April 30, 1987	March 16, 1985 October 15, 1985 April 15, 1986 October 31, 1986 May 31, 1987 October 30, 1987

	Editions and Supplements	Approved	Issued	Effective
Twelfth Edition Supplements	ASME/ANSI A17.1-1987 ASME/ANSI A17.1a-1988 ASME/ANSI A17.1b-1989	October 20, 1987 October 6, 1988 November 10, 1989	January 15, 1988 November 15, 1988 November 30, 1989	July 16, 1988 May 16, 1989 May 31, 1990
Thirteenth Edition Supplements	ASME A17.1-1990 ASME A17.1a-1991 ASME A17.1b-1992	October 8, 1990 October 21, 1991 October 28, 1992	February 8, 1991 February 28, 1992 December 29, 1992	August 9, 1991 August 29, 1992 June 30, 1993
Fourteenth Edition Supplements	ASME A17.1-1993 ASME A17.1a-1994 ASME A17.1b-1995	October 18, 1993 August 17, 1994 October 5, 1995	December 31, 1993 December 31, 1994 January 31, 1996	July 1, 1994 July 1, 1995 August 1, 1996
Fifteenth Edition Supplements	ASME A17.1-1996 ASME A17.1a-1997 ASME A17.1b-1998 ASME A17.1c-1999 ASME A17.1d-2000	October 3, 1996 January 8, 1998 November 13, 1998 May 13, 1999 October 12, 2000	December 31, 1996 February 27, 1998 February 19, 1999 June 30, 1999 November 30, 2000	July 1, 1997 August 28, 1998 August 20, 1999 December 31, 1999 January 31, 2001
Sixteenth Edition Supplements	ASME A17.1-2000 ASME A17.1a-2002 ASME A17.1b-2003	October 16, 2000 February 26, 2002 April 10, 2003	March 23, 2001 April 4, 2002 May 30, 2003	March 23, 2002 October 4, 2002 November 30, 2003
Seventeenth Edition Supplements	ASME A17.1-2004 ASME A17.1a-2005 ASME A17.1S-2005	January 14, 2004 March 18, 2005 March 23, 2005	April 30, 2004 April 29, 2005 August 12, 2005	October 31, 2004 October 29, 2005 February 12, 2006
Eighteenth Edition Supplements	ASME A17.1-2007/CSA B44-07 ASME A17.1a-2008/CSA B44a-08 ASME A17.1b-2009/CSA B44b-09	February 20, 2007 September 19, 2008 November 17, 2009	April 6, 2007 December 5, 2008 December 30, 2009	October 6, 2007 June 5, 2009 June 30, 2010
Nineteenth Edition	ASME A17.1-2010/CSA B44-10	October 19, 2010	December 30, 2010	June 30, 2011
Twentieth Edition	ASME A17.1-2013/CSA B44-13	May 31, 2013	October 21, 2013	April 21, 2014
Twenty-First Edition	ASME A17.1-2016/CSA B44-16	July 25, 2016	November 30, 2016	May 30, 2017
Twenty-Second Edition	ASME A17.1-2019/CSA B44:19	October 8, 2019	December 31, 2019	June 30, 2020
Twenty-Third Edition	ASME A17.1-2022/CSA B44:22	December 19, 2022	September 20, 2023	March 20, 2024

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(August 2022)

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Revisions and Errata. The committee processes revisions to this Code on a continuous basis to incorporate changes that appear necessary or desirable as demonstrated by the experience gained from the application of the Code. Approved revisions will be published in the next edition of the Code.

In addition, the committee may post errata on the committee web page. Errata become effective on the date posted. Users can register on the committee web page to receive e-mail notifications of posted errata.

This Code is always open for comment, and the committee welcomes proposals for revisions. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent background information and supporting documentation.

Cases

(a) The most common applications for cases are

- (1) to permit early implementation of a revision based on an urgent need
- (2) to provide alternative requirements
- (3) to allow users to gain experience with alternative or potential additional requirements prior to incorporation

directly into the Code

(4) to permit the use of a new material or process

(b) Users are cautioned that not all jurisdictions or owners automatically accept cases. Cases are not to be considered as approving, recommending, certifying, or endorsing any proprietary or specific design, or as limiting in any way the freedom of manufacturers, constructors, or owners to choose any method of design or any form of construction that conforms to the Code.

(c) A proposed case shall be written as a question and reply in the same format as existing cases. The proposal shall also include the following information:

- (1) a statement of need and background information
- (2) the urgency of the case (e.g., the case concerns a project that is underway or imminent)
- (3) the Code and the paragraph, figure, or table number(s)
- (4) the edition(s) of the Code to which the proposed case applies

(d) A case is effective for use when the public review process has been completed and it is approved by the cognizant supervisory board. Approved cases are posted on the committee web page.

Interpretations. Upon request, the committee will issue an interpretation of any requirement of this Code. An interpretation can be issued only in response to a request submitted through the online Interpretation Submittal Form at <http://go.asme.org/InterpretationRequest>. Upon submitting the form, the inquirer will receive an automatic e-mail confirming receipt.

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ASME PREFACE

GENERAL

This Code is one of the numerous codes and standards developed and published by The American Society of Mechanical Engineers (ASME) under the general auspices of the American National Standards Institute, Inc. (ANSI).

The Code is intended to serve as the basis for the design, construction, installation, operation, testing, inspection, maintenance, alteration, and repair of elevators, dumb-waiters, escalators, moving walks, and material lifts.

Safety codes and standards are intended to enhance public health and safety. Revisions result from committee consideration of factors such as technological advances, new data, and changing environmental and industry needs. Revisions do not imply that previous editions were inadequate.

This Code applies to new installations only, except [Part 1](#) and [Sections 5.10, 8.1, and 8.6](#) through [8.12](#), which apply to both new and existing installations. Also, see ASME A17.3, Safety Code for Existing Elevators and Escalators, for further requirements.

The following conditions are not addressed in this Code:

(a) assignment of the responsibility for compliance to any particular party.

(b) establishment of a frequency for periodic inspections and tests. See [Nonmandatory Appendix N](#) for recommended inspections and test intervals.

(c) assignment of responsibility for persons authorized to make and witness inspections and tests.

APPLICATION OF REQUIREMENTS TO NEW TECHNOLOGY

With the advent of new technologies, materials, and processes in the mechanical, structural, electronic, and optic fields, and the analytical capabilities now available, the flexibility to introduce products into the marketplace using these technical developments is desirable. Previous editions of ASME A17.1 had long-standing provisions, in [Section 1.2](#), that suggested that authorities having jurisdiction should recognize safety equivalent to that required by the Codes. This edition of ASME A17.1/CSA B44 recognizes that ASME A17.7/CSA B44.7 provides a structured method for establishing the safety of designs and products and that compliance with ASME A17.7/CSA B44.7 is equivalent to compliance with the requirements in ASME A17.1/CSA B44.

FORM AND ARRANGEMENT

This Code consists of Parts and Sections, each covering a specific subject so as to facilitate reference to the requirements.

The Foreword, Preface, Notes, and Appendices that are included in this Code are not part of this American National Standard. They are advisory in nature and are intended for clarification only.

In this edition, the revisions that are appearing for the first time are identified by **(19)**. Where editorial changes have been made, they are identified by **(ED)**. See also the Summary of Changes.

METRIC (SI) UNITS

This edition of the Code uses hard metric (SI) units wherever practical. The acceptable equivalent imperial units are shown in parentheses. Information on the usage of SI units and conversion to imperial units is contained in IEEE/ASTM SI 10-2016, American National Standard for Metric Practice; ASME Guide SI-1, Orientation and Guide for Use of SI (Metric) Units; or CAN/CSA-Z234.1, Canadian Metric Practice Guide.

Tables related to speed and load use the hard metric and hard imperial units in common practice, even though they are not exactly equivalent (e.g., see [Table 2.22.4.1](#), Minimum Oil Buffer Strokes). The tabular values have been derived using [8.2.1](#) formulas and the metric and imperial values for buffer strokes, safety stopping distances, etc., are therefore not equivalent.

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The following ASME publications are of special interest to users of this Code. For prices and availability, contact:

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