

ASME A17.6-2017
(Revision of ASME A17.6-2010)

Standard for Elevator Suspension, Compensation, and Governor Systems

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

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FOREWORD

This is the second edition of a Standard for elevator suspension and compensation systems as well as ropes for governor applications. This Standard has been developed by the American Society of Mechanical Engineers (ASME) to provide guidance to the elevator industry for the appropriate use of means for suspension, compensation, and governors. The second edition includes standards for three technologies for elevators, namely: steel wire ropes, aramid fiber ropes, and noncircular elastomeric-coated steel suspension members. Uniform standards for these important items are necessary to ensure consistent levels of safety and to provide guidance for the manufacturers of these items as well as the designers, manufacturers, installers, maintainers, and inspectors of elevator equipment.

As other technologies emerge and are deemed to be suitable for similar applications, this Standard will be expanded to include criteria for their usage.

In developing this Standard, experts were assembled from the steel wire rope, aramid fiber rope, and noncircular elastomeric-coated steel suspension members engineering and manufacturing fields. Relevant existing standards were studied during the development of this Standard and are referenced where appropriate. The scope of this Standard covers North American and international requirements in a comprehensive manner and does not conflict with existing American or international standards. This Standard is intended to be used in conjunction with the ASME A17.1/CSA B44, Safety Code for Elevators and Escalators, and related Codes and standards.

Steel Wire Rope for Elevators. Steel wire rope has been used for many years in the elevator industry, for suspension, compensation, and governor applications.

Due to the large range of applications in this diverse market, many variations of steel wire ropes are in current use. Examples include rope of regular and lang lay, left and right lay, preformed and nonpreformed. Such ropes may be of a variety of wire materials, from iron to high tensile steel and may be of corrosion resistant construction. Various core materials including natural and synthetic fiber and steel may also be used. Nominal imperial dimensions as well as SI dimensional ropes are used.

In recognition of the importance of this vital elevator component and the unique practices of the North American industry, this Standard was developed. This Standard covers the current applications and provides strength and material criteria as well as testing, compliance, inspection, replacement, and ordering information. Imperial and SI dimensions are addressed in the Standard. The purpose of this Standard is to enhance public safety and to provide guidance to manufacturers and users of steel wire rope.

Aramid Fiber Ropes and Elastomeric-Coated Steel Belts. With the appearance in the market place of new suspension and compensation means technologies, such as aramid fiber ropes and noncircular elastomeric-coated steel suspension members for elevators, the need for standards that will ensure the safe application of these items became evident. This Standard addresses these important technologies.

In developing the standards, extensive test results were studied and the properties and durability of the new suspension and compensation means were examined. The work included visits to major laboratories at which all aspects of the noncircular elastomeric-coated steel suspension members were tested.

The work included a visit to the factory of a major manufacturer of aramid fiber and technical presentations by experts in this technology. The test work of a major laboratory and field results from the application of aramid fiber rope on elevators were also studied.

Test facilities where the noncircular elastomeric-coated steel suspension members were extensively tested on elevators were also visited. In addition, technical presentations on the noncircular elastomeric-coated steel suspension members regarding their construction and testing took place.

Tests on both aramid fiber ropes and noncircular elastomeric-coated steel suspension members included life, durability, resistance to damage, traction, replacement criteria, effects of the environment, and many other criteria. This work was extremely helpful in developing the standards and building confidence in the validity of the requirements.

ASME A17.6-2017 was approved by the American National Standards Institute on September 29, 2017.

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PREFACE

GENERAL This is one of many standards developed by the American Society of Mechanical Engineers (ASME) under the general auspices of the American National Standards Institute (ANSI). 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 Standard is referenced by and intended to be used in conjunction with ASME A17.1/CSA B44, Safety Code for Elevators and Escalators, and related Codes and standards. Written inquiries regarding this Standard should be addressed to the Secretary of the ASME A17 Standards Committee.

NOTE: Referenced Codes, Standards, and Test Methods that appear with no date indicated shall be the edition in effect at the time of publication of this Standard.

FORM AND ARRANGEMENT This Standard consists of three Parts, each covering a specific technology related to elevator suspension and compensation means and governor ropes. The Foreword, Preface, and Notes that are included in this document are not part of this American National Standard. They are advisory in nature and are intended for clarification only.

SCOPE This Standard covers the means and members of suspension, compensation, and governor systems for elevators within the scope of ASME A17.1/CSA B44.

NOTE: It must be determined by the individual working committees as to the level of appropriateness of applying the New Technologies in their particular applications.

This Standard 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.

INTRODUCTION This Standard is intended to be used with ASME A17.1/CSA B44, Safety Code for Elevators and Escalators, A17.2, Guide for the Inspection of Elevators, Escalators, and Moving Walks, and A17.3, Safety Code for Existing Elevators and Escalators, and other Codes and Standards referenced by these Standards as well as other related Standards.

The ASME A17.1/CSA B44 Code specifically references the suspension and compensation means and governor systems covered by this Standard. This Standard was developed to provide safe, consistent criteria for steel wire rope, aramid fiber rope, noncircular elastomeric-coated steel suspension members and other means of suspension and compensation used in the Elevator Industry.

Part 1 covers steel wire rope.

Part 2 covers aramid fiber rope.

Part 3 covers noncircular elastomeric-coated steel suspension members.

The Standard is under the auspices of the ASME A17.1 Standards Committee and is subject to the operating procedures of this Committee.

ASME ELEVATOR PUBLICATIONS The American Society of Mechanical Engineers (ASME) has developed and published safety codes and standards for elevators, escalators, and related equipment since the first edition of A17.1, Safety Code for Elevators and Escalators, which was published in 1921.

This Code is one of the numerous codes and standards that have been or are being developed by The American Society of Mechanical Engineers.

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

Tel: 800-843-2763

Fax: 973-882-1717

E-Mail: customercare@asme.org

ASME Website: www.asme.org/shop

ASME A18.1, Safety Standard for Platform Lifts and Stairway Chairlifts. This safety Standard covers the design, construction, installation, operation, inspection, testing, maintenance, and repair of inclined stairway chairlifts and inclined and vertical platform lifts intended for transportation of a mobility impaired person only.

CORRESPONDENCE WITH A17 COMMITTEE ASME codes and standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this and other ASME A17 codes and standards may interact with the committee by requesting interpretations, proposing revisions, and attending committee meetings. Correspondence should be addressed to:

Secretary, A17 Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016
<http://go.asme.org/Inquiry>

All correspondence to the Committee must include the individual's name and post office address in case the Committee needs to request further information.

Proposing Revisions. Revisions are made periodically to the Code to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the procedures, and in order to conform to developments in the elevator art. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Code. Such proposals should be as specific as possible, citing the Section number(s), the proposed wording, and a detailed description of the reasons for the proposal including any pertinent documentation.

Requesting Interpretations. Upon request, the A17 Committee will render an interpretation of any requirement of the Code. Interpretations can only be rendered in response to a written request sent to the Secretary of the A17 Standards Committee.

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If the Inquirer is unable to use the online form, he/she may mail the request to the Secretary of the A17 Standards Committee at the above address. The request for interpretation should be clear and unambiguous. It is further recommended that the Inquirer submit his/her request in the following format:

Subject: Cite the applicable Section number(s) and the topic of the inquiry in one or two words.

Edition: Cite the applicable edition and supplement of the Code for which the interpretation is being requested.

Question: Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. Please provide a condensed and precise question, composed in such a way that a "yes" or "no" reply is acceptable.

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Requests that are not in the format described above will be rewritten in this format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME committee or subcommittee. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

Attending Committee Meetings. The A17 Standards Committee and the various Working Committees regularly hold meetings and/or telephone conferences, all of which are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the Standards Committee.

ASME A17.6-2017

SUMMARY OF CHANGES

Following approval by the ASME A17 Committee and ASME, and after public review, ASME A17.6-2017 was approved by the American National Standards Institute on September 29, 2017.

ASME A17.6-2017 includes the following changes identified by a margin note, **(17)**.

<i>Page</i>	<i>Location</i>	<i>Change</i>
12	1.10.1.1	Subparagraph (c) revised
13	1.10.1.2	(1) Paragraph 1.10.1.2.1 revised (2) Paragraph 1.10.1.2.2 deleted
27	Table I-1.1-1	Sixth column head revised
29	Table I-1.1-2	Sixth column head revised
31	Table I-1.1-3	Sixth column head revised
35	Figure A-1	Revised

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Part 1

Stranded Carbon Steel Wire Ropes for Elevators

SECTION 1.1 SCOPE

Part 1 covers the general requirements for the more common types of stranded steel wire ropes for hoisting, compensation, and governor applications on passenger or freight elevators. Included in the scope of this Part are steel wire ropes in various grades and constructions from 4 mm to 38 mm ($\frac{5}{32}$ in. to $1\frac{1}{2}$ in.) manufactured from uncoated wire or metallic coated wire. For specific applications, additional or alternative requirements may apply, provided equivalent safety is maintained.

Part 1 covers regular lay and lang lay, preformed and nonpreformed elevator rope in nominal imperial dimensions as well as SI dimensions. Various constructions of steel wire rope are covered, i.e., Seale, Warrington, and Filler. **Part 1** covers the broad range of wire materials in current use including Iron, Traction, Extra High Strength Traction, 1570 Single, 1180/1770 Dual, 1370/1770 Dual, 1770 Single, 1960 Single, and 2300 Single. Various rope core materials in current use are covered by this Part including natural and synthetic fiber cores and steel cores. This Part covers ropes made from uncoated wires or metallic coated wires (e.g., galvanized). This Part includes criteria for testing and compliance of rope, replacement of rope, and ordering information for steel wire rope.

NOTE: **Part 1** is written in the combined format, presenting requirements for rope products in both Imperial units, utilized historically in the SI and U.S. Customary units as recognized by current international standards. The values stated in SI (metric) units or Imperial units are to be regarded separately. The values are not exact equivalents; therefore, each system must be used independently of the other.

SECTION 1.2 REFERENCES

Part 1 incorporates, by dated or undated reference, provisions from other publications. These normative references are cited at their appropriate place in the text, and the publications are listed. For dated references, subsequent amendments to or revisions of any of these publications apply to this Part only when incorporated by

amendment or revision. For undated references, the latest edition would apply.

ASME A17.1/CSA B44 (latest edition), Safety Code for Elevators and Escalators

ASME A17.2 (latest edition), Guide for Inspection of Elevators, Escalators, and Moving Walks

Publisher: The American Society of Mechanical Engineers (ASME), Two Park Avenue, New York, NY 10016-5990 (www.asme.org)

ASTM A931-2008, Standard Test Method for Tension Testing of Wire Ropes and Strand

ASTM A1007-2000, Standard Specification for Carbon Steel Wire for Wire Rope

ASTM A1023-2002, Specification for Stranded Carbon Steel Wire Ropes for General Purposes

Publisher: American Society for Testing and Materials (ASTM International), 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959 (www.astm.org)

ISO 2020-1:1997, Aerospace — Preformed flexible steel wire rope for aircraft controls — Part 1: Dimensions and loads

ISO 2232:1990, Round drawn wire for general purpose non-alloy steel wire ropes — Specifications

ISO 3108:1974, Steel wire ropes for general purposes — determination of actual breaking load

ISO 4101:1983, Drawn steel wire for elevator ropes — Specifications

ISO 4344:2004, Steel wire ropes for lifts — Minimum requirements

ISO 4345:1988, Steel wire ropes — Fibre main cores — Specification

ISO 4346:1977, Steel wire ropes for general purposes — Lubricants — Basic requirements

ISO 9001, Quality management systems — Requirements

Publisher: International Organization for Standardization (ISO), Central Secretariat, Chemin de Blandonnet 8, Case Postale 401, 1214 Vernier, Geneva, Switzerland (www.iso.org)