ASME B20.1-2015
(Revision of ASME B20.1-2012)

Safety Standard for Conveyors and Related Equipment

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: November 30, 2015

The next edition of this Standard is scheduled for publication in 2018. This Standard will become effective 1 year after the Date of Issuance.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the ASME Web site under the Committee Pages at http://cstools.asme.org/ as they are issued. Interpretations will also be included with each edition.

Errata to codes and standards may be posted on the ASME Web site under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The Committee Pages can be found at http://cstools.asme.org/. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting "Errata" in the "Publication Information" section.

The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

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FOREWORD

The first edition of the Safety Standard for Conveyors, Cableways, and Related Equipment was sponsored by the National Conservation Bureau and The American Society of Mechanical Engineers (ASME). It was approved by the American Standards Association [now known as the American National Standards Institute (ANSI)] as American Standard B20.1-1947.

In 1950, the Sectional Committee B20 was reorganized under the sponsorship of the Accident Prevention Department of the Association of Casualty and Surety Companies and ASME. The following four Subcommittees were formed to make specific recommendations for revisions:

Subcommittee No. 1: Scope and Intent
Subcommittee No. 2: Nomenclature and Definitions
Subcommittee No. 3: Portable Conveyors
Subcommittee No. 4: Conveyors in General

The definitions section was based on the conveyor industry dictionary, Conveyor Terms and Definitions, as prepared by the Technical Committee (now the Engineering Conference) of the Conveyor Equipment Manufacturers Association (CEMA).

The second edition of this Standard, dated April 1955, was submitted in draft form to the Sectional Committee for approval and distributed to industry in general for criticism and comment. Approval was then given by the Sectional Committee, the sponsors, and the American Standards Association. The Standard was designated as American Standard B20.1-1957 on December 4, 1957.

In 1967, the third edition of the Safety Standard for Conveyors and Related Equipment was submitted in draft form to representatives of industry for comment. It was subsequently approved by the Sectional Committee, the sponsors, and ANSI for issuance as American National Standard B20.1-1972 on February 17, 1972.

The fourth edition of the Safety Standard for Conveyors and Related Equipment was undertaken in 1973 to assist the Office of Safety and Health Standards, U.S. Department of Labor, which indicated interest in the Standard.

A change in format from a specification standard to a performance standard was deemed necessary. Simply stated, the Standard describes what end result should be achieved without the limiting specification usually given by a design and without the inclusion of finite material selection or dimensions.

The fourth edition was subsequently approved by the B20 American National Standards Committee, the Secretariat, and ANSI for issuance as American National Standard B20.1-1976 on June 14, 1976.

In accordance with the policy of ANSI, the B20 Committee began working on a revision of B20.1-1976 in February 1980. The fifth edition was approved by the B20 Committee, the sponsor (ASME), and ANSI for issuance as American National Standard B20.1-1984 on March 13, 1984.

Per the procedures outlined and implemented in the fifth edition, the sixth edition was approved by the B20 Committee, the sponsor (ASME), and ANSI for issuance as American National Standard B20.1-1987 on March 11, 1987. The seventh edition was approved for issuance as an American National Standard on March 26, 1990. The eighth edition was approved for issuance as an American National Standard on August 9, 1993.

The ninth edition was a compilation of changes from the 1993 edition, B20.1a-1994, and B20.1b-1995. It was approved for issuance as an American National Standard on May 23, 1997.

The 2000 edition was a compilation of changes from the B20.1a-1997 and B20.1b-1998 addenda. It was approved for issuance as an American National Standard on December 14, 2000.

Following approval by the B20 Committee and ASME, and after public review, ASME B20.1-2003 was approved by ANSI on October 9, 2003. The 2003 edition was a revision to ASME B20.1-2000.

ASME B20.1-2006 was approved by ANSI on September 7, 2006. The 2006 edition was a revision to ASME B20.1-2003.

ASME B20.1-2009 was approved by ANSI on February 2, 2009. The 2009 edition was a revision to ASME B20.1-2006.

ASME B20.1-2012 was approved by ANSI on March 28, 2012. The 2012 edition was a revision to ASME B20.1-2009.

ASME B20.1-2015 was approved by ANSI on September 9, 2015. This 2015 edition is a revision to ASME B20.1-2012.

This Standard shall become effective 1 year from the date of issuance.

Safety standards for mechanical power apparatus are published in ANSI B15.1-2000 (R2008), Safety Standard for Mechanical Power Transmission Apparatus. Safety standards for lockout and tagout procedures are published in ANSI/ASSE Z244.1-2003 (R2014), Control of Hazardous Energy — Lockout/Tagout and Alternative Methods, and OSHA Standard 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout). The use of recommendations and guidelines as published by CEMA, Safety Label Brochure No. 201 and Application Guidelines for Vertical Reciprocating Conveyors, published by the Conveyor and Sortation Systems (CSS) of the Material Handling Institute in conjunction with ASME B20.1 is encouraged, as are the above-mentioned standards.

The values stated within this Standard are in both SI and U.S. Customary units, with the latter placed in parentheses. These units are essentially interchangeable, and, depending on the country, as well as industry preferences, the user will determine which values are to be regarded as the standard.

Safety codes and standards are intended to enhance public 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.

ASME B20 COMMITTEE
Safety Standard for Conveyors and Related Equipment

(The following is a roster of the Committee at the time of publication of this Standard.)

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ASME B20.1-2015
SUMMARY OF CHANGES

Following approval by the ASME B20 Committee and ASME, and after public review, ASME B20.1-2015 was approved by the American National Standards Institute on September 9, 2015.

ASME B20.1-2015 includes the following changes identified by a margin note, **(15)**.

Page	*Location*	*Change*
2, 6	Section 4	Definitions for *risk assessment* and *risk reduction/mitigation* added
7	5.5	Title and text revised
9	5.11.3	Revised
10	5.16	Added
17–21	Mandatory Appendix I	Added

SPECIAL NOTE:

The interpretations to ASME B20.1 are included in this edition as a separate section for the user's convenience.

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SAFETY STANDARD FOR CONVEYORS AND RELATED EQUIPMENT

INTRODUCTION

Accidents resulting from the manual handling of materials have been reduced by the use of conveying and other forms of mechanical handling equipment. A further reduction in the accident rate can be gained by following safe practices in the design, construction, installation, operation, and maintenance of such equipment.

The design and installation of conveyors and conveyor systems should be supervised by qualified engineers. Likewise, the operation and maintenance of conveyors and systems should be supervised by trained personnel.

The purpose of this Standard is to present certain guides for the design, construction, installation, operation, and maintenance of conveyors and related equipment.

Those portions of this Standard relating to maintenance and operation procedures are fully as important as those relating to design and installation. The best design features may be negated by faulty maintenance and operating practices. It is important that operating and maintenance personnel be instructed in recognizing hazards and pertinent safety precautions.

Operation and maintenance instructions in this Safety Standard are intended for general applications. The equipment manufacturer and/or installer should be consulted for specific operating or maintenance instructions.

1 SCOPE

This Standard applies to the design, construction, installation, maintenance, inspection, and operation of conveyors and conveying systems in relation to hazards. The conveyors may be of the bulk material, package, or unit-handling types, where the installation is designed for permanent, temporary, or portable operation.

This Standard shall apply, with the exceptions noted below, to all conveyor installations.

This Standard specifically excludes any conveyor designed, installed, or used primarily for the movement of people. This Standard does, however, apply to certain conveying devices that incorporate within their supporting structure workstations or operator's stations specifically designed for authorized operating personnel.

This Standard does not apply to conveyors such as underground mine conveyors for which specific standards are already in effect, or to equipment such as industrial trucks, tractors, trailers, automatic guided vehicles, tiering machines (except pallet load tierers), cranes, hoists, power shovels, power scoops, bucket drag lines, trenchers, platform elevators designed to carry passengers or an operator, manlifts, moving walks, moving stairways (escalators), highway or railroad vehicles, cableways, tramways, dumbwaiters, material lifts, industrial scissors lifts, pneumatic conveyors, robots, or integral machine transfer devices. Some of the foregoing have specific standards.

The provisions of this Standard shall apply to equipment installed 1 yr after the date of issuance.

2 REFERENCE TO OTHER CODES

Certain other codes and standards have been cited as references in this Standard. Reference to them does not constitute inclusion of the complete text of such codes or standards as a part of this Standard.

This Safety Standard for conveyors is supplementary to any law or code covering fire or health regulations.

3 INTENT

The intent of this Standard is to provide for safe operation and maintenance of conveying equipment.

Suggestions for improvement of this Standard may be submitted to the Secretary, B20 Committee, ASME, Two Park Avenue, New York, NY 10016-5990.

Proposals should be written in accordance with the following format:

(a) Specify page and paragraph designation of the pertinent standard.

(b) Indicate suggested change (addition, deletion, revision, etc.).

(c) Briefly state reason and/or evidence for suggested change.

(d) Separately submit suggested changes if more than one paragraph is affected.

The B20 Committee will consider each suggested change at its first meeting after receipt of the suggested change(s).

The B20 Committee will render an interpretation of any requirement of the Standard. Interpretations will be

rendered only in response to a written request sent to the Secretary, B20 Committee, ASME, Two Park Avenue, New York, NY 10016-5990.

The request for interpretation shall be in the following format:

Subject: Cite the applicable paragraph number(s) and provide a concise description.

Edition: Cite the applicable edition of the standard 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. The inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

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. ASME does not "approve," "certify," "rate," or "endorse" any item, construction, proprietary device, or activity.

(15) 4 DEFINITIONS[1]

accessible: applies to hazardous objects not guarded or isolated and likely to be contacted inadvertently.

actuator: a device that initiates the action of controls or controllers and is manually operated. The actuator may be a push button, toggle switch, foot pedal, hand lever, hand-set timer, or any other device that performs the described function.

antirunaway: a safety device to stop a declining conveyor and thus prevent moving away in the event of a mechanical or electrical failure.

apron pan: one of a series of overlapping or interlocking plates or shapes that, together with others, form the conveyor bed.

automatically controlled: describing the operation by the action of a mechanism that is initiated by some impersonal influence, such as a conveyor that is started by a low-level bin indicator.

backstop: a mechanical device to prevent reversal of a loaded conveyor under action of gravity when forward travel is interrupted.

bed:

(a) that part of a conveyor upon which the load or carrying medium rests or slides while being conveyed

(b) in bulk material conveyors, the mass of material being conveyed

belt idler: a roller or series of rollers that supports the belt of a belt conveyor.

belt tripper: a device incorporating a system of pulleys that causes the conveyor belt to discharge material at one or more points along the length of the conveyor.

boom: a cantilevered member or structure that may be hinged, fixed, or pivoted.

brake: a friction device for slowing down conveyor components, bringing conveyor equipment to a controlled stop, holding traveling or traversing equipment in a selected location, preventing reverse travel, and controlling overspeed due to the action of gravity.

bunker: a large bin or compartment for storage of bulk materials.

car unloader: a type of conveyor characterized by a shallow, horizontal loading section that enables it to receive and unload material from hopper bottom cars without requiring a pit or other excavation.

carrier:

(a) a device attached to or hung from trolleys to support the load

(b) the receptacle in which objects are placed for transmittal through a conveying system

(c) the moving part of a vertical or inclined reciprocating conveyor that supports the load

chain: a series of links pivotally joined together to form a medium for conveying or transmitting motion or power. General classes of chain common to conveyors are detachable, pintle, combination, roller, rivetless, coil, inverted tooth, and bar link chains.

chute: a trough through which bulk materials or objects are directed and lowered by gravity. The trough may be open or enclosed, straight or curved.

control: the system governing the starting, stopping, direction of motion, acceleration, speed, retardation, identification, and function of the moving member in a predetermined manner.

controller: an electromechanical device or assembly of devices for starting, stopping, accelerating, or decelerating a drive or serving to govern in some predetermined manner the power delivered to the drive.

conveying medium: that portion of a conveyor that moves or carries materials, packages, or objects.

conveyor: a horizontal, inclined, or vertical device for moving or transporting bulk material, packages, or objects in a path predetermined by the design of the device and having points of loading and discharge, fixed

[1] Many definitions were extracted from the latest revision of Conveyor Terms and Definitions, Book No. 102, prepared by the Engineering Conference of the Conveyor Equipment Manufacturers Association. For definitions of terms other than those defined in section 4, refer to this publication.