ASME B29.100-2011
(Revision of ASME B29.100-2002)

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Double-Pitch Roller Chains, Attachments, and Sprockets

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

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FOREWORD

For the first edition of ASME B29.100, the B29 Standards Committee agreed to propose a draft standard to consolidate and revise the following three chain standards: ASME B29.1M, Precision Power Transmission Roller Chains, Attachments, and Sprockets; ASME B29.3M, Double-Pitch Power Transmission Roller Chains and Sprockets; and ASME B29.4M, Double-Pitch Conveyor Roller Chains, Attachments, and Sprockets. The new standard was designated ASME B29.100-2002 and was approved as an American National Standard on April 3, 2002.

B29.3. For many years, roller chain manufacturers furnished for specific installations an economical power transmission chain differing only in pitch from the standardized series of transmission roller chains that conformed to American Standard ASA B29.1. Such practice became so common and the chains of such universal use that in 1948 the Roller Chain Technical Committee of the Association of Roller and Silent Chain Manufacturers, now known as the American Chain Association, developed standards that were submitted for adoption as American Standards.

This standard described a limited series of double-pitch power transmission roller chains that supplements the base chain series conforming to the standard B29.1. These chains differ from the base chains only in pitch, which is double that of the corresponding base chain. Supplementary information in Appendix A on speed and power transmission ratings indicated their special usefulness for drives operating at slow to moderate speeds, with moderate loads and long center distances.

ASME B29.3M-1994 incorporated a restatement of the definition of minimum ultimate tensile strength, and minor changes in the values for maximum pin diameter and minimum bushing inner diameter. The dimensional changes were to allow a direct error-free conversion from U.S. Customary inch units to SI (Metric) units. Similar changes were made in the International Standard ISO 1275. ASME B29.3M-1994 was approved by the American National Standards Institute on March 15, 1994.

ASME B29.100-2002 included three significant modifications to B29.3: a revision to the minimum ultimate tensile strength definition, the addition of the requirements for roller chain preloading, and the removal of some sprocket data that was identical to B29.1. The sprocket information sections were revised to reference the appropriate sections of B29.1 sprocket data.

B29.4. For many years, roller chain manufacturers have furnished a substantial volume of precision steel roller chains and sprockets of a limited series for specific conveying applications. Such chains consist of pins and bushings identical to American National Standard B29.1 transmission roller chains; rollers identical to or, alternatively, approximately twice as large in diameter as those of such transmission roller chains; and link plates with straight-edged contours, extended in pitch to be double the pitch of those of the corresponding transmission roller chains conforming to the latest edition of B29.1. (Such chains are referred to in this Standard as base series chains.)

These double-pitch steel conveyor chains have frequently been assembled with some parts of modified design to adapt the chains for use in conveying, elevating, or timing operations. The parts most commonly modified are pin link plates, roller link plates, and pins.

Previously, variation in link plate thickness, attachment link plate hole size and location, diameter and length of extension pins, and sprocket details caused lack of interchangeability and tended to restrict users to one source of supply. For these reasons, the Association of Roller and Silent Chain Manufacturers began to develop the B29.4 standard in 1947. It was approved as an American National Standard on May 30, 1972, and supplemented B29.1.

Nonmandatory Appendix A included suggestions on application and use of chains covered by this Standard. The information on conveyor capacity ratings indicated the special usefulness of these chains and attachment links for slow-speed conveyor applications.

ASME B29.4M-1994, which was approved by the American National Standards Institute on March 15, 1994, incorporated a restatement of the definition of minimum ultimate tensile strength, and minor changes in the values for maximum pitch diameter and minimum bushing inner diameter. The dimensional changes were to allow a direct error-free conversion from

U.S. Customary units to SI (Metric) units. Similar changes were made in the International Standard ISO 1275.

ASME B29.100-2002 included three significant modifications to B29.4: a revision to the minimum ultimate tensile strength definition, the addition that roller chains conforming to this standard should be preloaded at the discretion of the manufacturer or by agreement between the manufacturer and the user, and the removal of some sprocket data that was identical to B29.1. The sprocket information sections were revised to reference the appropriate sections of B29.1 sprocket data.

In 2008, the B29 Standards Committee agreed to remove the portion of the ASME B29.100 standard formerly known as ASME B29.1 from the incorporated standard. The former standards ASME B29.3 and ASME B29.4 were consolidated in ASME B29.100-2011. No changes were made to dimensional limits or capacities. Some text and several tables were merged to eliminate redundancies. ASME B29.100-2011 was approved as an American National Standard on November 16, 2011.

Dimensional limits in this Standard are presented in U.S. Customary inch–pound units. Companion tabulations are included to show conversions of the final limiting values into SI (Metric) units in accordance with ASME Guide SI-1, ASME Orientation and Guide for Use of SI (Metric) Units. Most formulas and relationships are intentionally presented only in U.S. Customary units, to preclude any ambiguity between them and the tabulated values.

In most respects, ASME B29.100-2011 is harmonized with ISO 1275. However, the B29 Standards Committee decided to maintain the separate B29.100 standard for the following two reasons:

(a) ISO permits only SI units to be shown in International Standards. The ANS chains and sprockets in this Standard were originally designed in U.S. Customary inch–pound units. Conversion to SI units and rounding before making critical calculations introduce deviations that can be detrimental to roller chain functioning.

(b) The ANS tooth form in ASME B29.100 fits within the ISO 1275 sprocket tooth form envelope, but the tooth form in ASME B29.100 is described in much more detail. Deviations from the ANS tooth form, but within the ISO 1275 envelope, can be detrimental to chain performance.

ASME B29 STANDARDS COMMITTEE
Chains, Attachments, and Sprockets for Power Transmission and Conveying

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

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General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, B29 Standards Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990
http://go.asme.org/Inquiry

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. 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 documentation.

Interpretations. Upon request, the B29 Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the B29 Standards Committee.

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 paragraph number(s) and the topic of the inquiry.
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.

Requests that are not in this format 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 B29 Standards Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B29 Standards Committee.

DOUBLE-PITCH ROLLER CHAINS, ATTACHMENTS, AND SPROCKETS

1 DOUBLE-PITCH ROLLER CHAINS

1.1 Nomenclature

The following definitions are illustrated in Figs. 1 and 2:

connecting links (cotter pin type) [Fig. 2, sketches (f) and (g)]: outside links consisting of a pin link plate, *E*; two pins, *G–G;* a detachable pin link plate, *D*; and two cotter pins, *H–H.*

double-pitch conveyor roller chain, large roller series [Fig. 1, sketch (b)]: same as the small roller series (see below), except that the rollers are approximately twice the diameter. The large roller series is intended for use when the conveyed load is carried by the rollers.

double-pitch conveyor roller chain, small roller series [Fig. 1, sketch (a)]: series of alternately assembled roller links and pin links in which the pins articulate inside the bushings and the rollers are free to turn on the bushings. The pins and bushings are press-fitted into their respective link plates. The pitch of the link plates is twice that of link plates of the base series chain. Pin link plates and roller link plates have identical straight-edged contours. Some chains have extra-thickness link plates that are intended for use when the conveyed load is carried by the link plate edges.

double-pitch power transmission roller chain [Fig. 1, sketch (c)]: similar to double-pitch conveyor roller chain, small roller series, except the link plate widths are usually reduced in the center to produce a figure-eight shape. This reduces the weight of the chain to make it more suitable for power transmission applications.

offset links (conveyor offset link — large roller series, cotter pin type) [Fig. 2, sketch (i)]: links consisting of two offset link plates, *I–I;* a bushing, *B*; a roller of the standard roller series, C_S; a removable pin, *J*; and a cotter pin, *H*.

offset links (conveyor offset link — power transmission series, cotter pin type) [Fig. 2, sketch (j)]: links consisting of two offset link plates, *I–I;* a bushing, *B*; a roller of the standard roller series, C_S; a removable pin, *J*; and a cotter pin, *H*.

offset links (conveyor offset link — small roller series, cotter pin type) [Fig. 2, sketch (h)]: links consisting of two offset link plates, *I–I;* a bushing, *B*; a roller of the standard roller series, C_S; a removable pin, *J*; and a cotter pin, *H*.

pin links (riveted type) [Fig. 2, sketches (d) and (e)]: outside links consisting of two pin link plates, *F–F,* and two pins, *F–F.*

roller links for large roller conveyor series [Fig. 2, sketch (b)]: inside links consisting of two roller link plates, *A–A;* two bushings, *B–B;* and two rollers of the large roller series, C_L–C_L.

roller links for power transmission series [Fig. 2, sketch (c)]: inside links consisting of two figure-eight shaped roller link plates, *A–A,* two bushings, *B–B;* and two small-diameter rollers, C_S–C_S.

roller links for small roller conveyor series [Fig. 2, sketch (a)]: inside links consisting of two straight-edged roller link plates, *A–A;* two bushings, *B–B;* and two small-diameter rollers, C_S–C_S.

1.2 General Proportions

Sizes of the various chain components, and assembled length and strength, are approximately proportional to pitch, *P*, as follows:

(a) The roller diameter for the small roller conveyor and power transmission chains equals approximately 0.312*P*, and for the large roller series it equals approximately 0.625*P*.

(b) The *chain width* is defined as the distance between roller link plates and equals approximately 0.312*P*.

(c) The pin diameter equals approximately 0.156*P*.

(d) The thickness of link plates for regular series chain sizes not designated H equals approximately 0.062*P*. For heavy series chain sizes designated H, the link plate thickness equals approximately

(1) 0.062 × pitch in inches + 0.031 in. for U.S. Customary units

(2) 0.062 × pitch in millimeters + 0.79 mm for SI (Metric) units

(e) The maximum width of link plates equals 0.475*P* for both pin-link and roller-link plates that have identical straight-edged contours.

1.3 Numbering System — Standard Chain Numbers

The power transmission series is identified by the numerical sum of 2000 and the standard base series chain number. Conveyor chain of the small roller series is identified by the prefix C, followed by the numerical sum of 2000 and the standard base series chain number.