

ASME B29.24-2002
(Revision of ASME B29.24M-1995)

REAFFIRMED 2016

ROLLER LOAD CHAINS FOR OVERHEAD HOISTS

AN AMERICAN NATIONAL STANDARD



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Mechanical Engineers

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ROLLER LOAD CHAINS FOR OVERHEAD HOISTS

ASME B29.24-2002
(Revision of ASME B29.24M-1995)

Date of Issuance: September 26, 2002

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FOREWORD

A number of specialized roller chains are made and supplied to original equipment manufacturers for use as load chains on overhead hoists. Although these chains are of similar design and construction, and are usually dimensionally interchangeable with equivalent pitch ANSI B29.1, Power Transmission Roller Chains, they differ in that they are normally made using select steels and/or specially treated chain parts to provide for the higher tensile and fatigue strength properties required to meet the rated load capacities of the overhead hoists in which they are used.

Hoist load chains are consequently assigned special chain numbers to distinguish them from equivalent pitch B29.1 or other roller chains, which even if dimensionally interchangeable, may not have the necessary strength or special characteristics for replacement of the original hoist load chain.

It was recognized by the Roller Chain Technical Committee of the American Chain Association that a potential risk of personal injury could occur as a result of chain failure if the original load chain was inadvertently replaced by a lower strength chain, or if proper use, care, and maintenance procedures were not followed. Consequently, a committee was formed in October 1978 to prepare a standard for chains used in overhead hoists to serve as a guide to users and purchasers of overhead hoists with regard to hoist chain designations, dimensions, ultimate strength, maintenance, and inspection procedures, and restrictions for chain replacement. The standard would also provide a reference in related standards such as ASME/ANSI B30.16, Overhead Hoists (Underhung), (latest edition) with regard to chain care and replacement.

In tabulating dimensional information in this Standard, customary inch-pound units have been used. Additionally, companion tabulations have been included in order to provide translations of these values into metric (SI) units in accordance with ASME Guide SI-1, ASME Orientation and Guide for use of SI (Metric) Units. For this reason, certain formulas and relationships have been intentionally presented only in customary units so as to preclude any ambiguity between them and the tabulated values.

ASME B29.24M-1995 included two significant modifications. The first is a revised definition of *Minimum Ultimate Tensile Strength* that clarifies the meaning and use of the term. The second is a revision to the listed values for *maximum pin diameter*. The changes in pin diameter will not affect the interchangeability of the chains. The pin diameters were changed to provide a national basis for conversion between conventional (inch) and SI (metric) dimensions. With concurrent changes in the related ISO standards, a long-standing source of potential discrepancies will be eliminated.

The latest revision of this Standard includes two changes. One is the inclusion of the requirements to preload all chains covered by this Standard. The minimum preload values are derived from the requirements specified in the hoist standards such as ASME B30.21, Manually Lever Operated Hoists. The second change is the removal of 1 in. pitch-80 HS series chain.

Suggestions for the improvement of this Standard are welcome. They should be addressed to the Secretary, ASME B29 Committee, Three Park Avenue, New York, NY 10016-5990.

This Standard was approved as an American National Standard on August 20, 2002.

ASME STANDARDS COMMITTEE B29

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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Secretary, B29 Main Committee
The American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

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 Main 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, which 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.

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Attending Committee Meetings. The B29 Main Committee regularly holds meetings, which are open to the public. Persons wishing to attend any meeting should contact the Secretary of the B29 Main Committee.

ROLLER LOAD CHAINS FOR OVERHEAD HOISTS

1 SCOPE

This Standard covers specialized roller chains that are designed specifically as load chains for use in overhead hoists.

2 PURPOSE

The purpose of this Standard is to serve as a guide to purchasers and users of overhead hoists, and also as a reference in related standards such as ASME/ANSI B30.16, Overhead Hoists (Underhung), (latest edition) with respect to roller load chains being made specifically for use in various types of overhead hoists, including general chain dimensions, chain strengths, inspection and maintenance procedures, and guidelines for the proper selection of replacement chain.

3 ROLLER LOAD CHAINS

3.1 Nomenclature

These chains consist of a series of alternately assembled roller links and pin links in which the pins articulate inside the bushing and the rollers are free to turn on the bushing. The pins and bushing are press fit in their respective link plates. See Fig. 1.

3.2 General Proportions

- (a) Roller diameter is approximately $\frac{5}{8}$ of the pitch.
- (b) Chain width is defined as the distance between roller link plates. It is approximately $\frac{5}{8}$ of the chain pitch.
- (c) Pin diameter is approximately $\frac{5}{16}$ of the pitch or $\frac{1}{2}$ the roller diameter.
- (d) Maximum height of the roller link plates — 0.95 of the pitch.
- (e) Maximum height of pin link plates — 0.82 of the pitch.
- (f) Link plate thickness is approximately $\frac{1}{8}$ of the chain pitch.

3.3 Numbering System

The chain numbering system adopted for this Standard is based on chain pitch, and also on chain proportions and link plate thickness as compared to the majority of chains shown for a given pitch. A listing of load chain numbers and related chain dimensions is given in Table 1. The numbering system consists of a two digit number, followed by either a single or double letter suffix. These numbers and letter denote the following:

- (a) Left-Hand Digit — denotes number of $\frac{1}{8}$ in. in the chain pitch
- (b) Right-Hand Digit
 - (1) 0 (zero) denotes chain of usual proportions
 - (2) 1 (one) denotes chain of special proportions
- (c) Letter Suffix
 - (1) S denotes normal link plate thickness
 - (2) HS denotes heavier than normal link plate thickness

3.4 Minimum Ultimate Tensile Strength

Minimum Ultimate Tensile Strength (M.U.T.S.) for chain covered by this Standard is the minimum force at which an unused, undamaged chain could fail when subjected to a single tensile loading test.

WARNING: The Minimum Ultimate Tensile Strength is NOT a “working load”! The M.U.T.S. greatly exceeds the maximum force that may be applied to the chain.

(a) *Test Procedure.* A tensile force is slowly applied, at a rate not to exceed 2.0 in. per min, in a uniaxial direction, to the ends of the chain sample.

(b) The tensile test is a destructive test. Even though the chain may not visibly fail when subjected to the Minimum Ultimate Tensile Force, it will have been damaged and will be unfit for service.

3.5 Length Tolerance

New chains under standard measuring load should not be underlength. The overlength tolerance is shown in Table 1 and it is based on: