

ASME B29.21-2013

[Revision and Redesignation of ASME B29.21M-1996 (R2003)]

700 Class Chains, Attachments, and Sprocket Teeth for Water and Sewage Treatment Plants

AN AMERICAN NATIONAL STANDARD



**The American Society of
Mechanical Engineers**

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Two Park Avenue • New York, NY • 10016 USA

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FOREWORD

Since the development of this Standard in 1975 and the subsequent revisions published in 1981 and 1996, it has been noted that within the marketplace the use of chains made from plastics or stainless steels has become more prevalent. In most cases these chains are derivations of the traditional "700 Class" cast iron or welded steel chains that were the basis of the original Standard. These new products offer system designers alternatives in terms of strength, wear life, corrosion resistance, system weight, ease of maintenance, and cost.

This revision incorporates the following product groups not found in previous editions of the Standard:

- Stainless steel fabricated chains (SS715 and SS709)
- Nonmetallic (plastic) chains (NM720)

Suggestions for improvement of this Standard are welcome. They should be sent to the Secretary, B29 Committee, The American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016-5990.

This revision was approved as an American National Standard on November 20, 2013.

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Chains, Attachments, and Sprockets for Power Transmission and Conveying

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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.

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The request for interpretation should be clear and unambiguous. It is further recommended that the inquirer submit his or 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 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 may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

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700 CLASS CHAINS, ATTACHMENTS, AND SPROCKET TEETH FOR WATER AND SEWAGE TREATMENT PLANTS

1 NOMENCLATURE

1.1 Chain Types

- Cast iron chains
- Welded steel chains
- Stainless steel fabricated chains
- Nonmetallic (plastic) chains

1.1.1 Cast Iron Chains. Cast iron chains consist of a series of identical offset links having barrels to contact the sprocket teeth and pins that articulate in the barrels of links. Radius curves in the sidebars (chain savers), if present, operate on sprocket flanges known as chain-saver rims. The purpose of the chain saver is to provide additional link support to reduce barrel O.D. wear. See Figs. 1 and 2.

Pins are fixed in the sidebar pitch holes by mechanical locks to prevent rotation in the sidebar pitch holes. Pin cotters are stainless steel.

Pin material is medium carbon steel or equivalent at 302 BHN minimum. Cast links, including attachments, are pearlitic malleable iron ASTM A220 Grade 600 or equivalent at 179 BHN minimum.

1.1.2 Welded Steel Chains. Welded steel chains consist of a series of identical offset links having barrels fixed to the sidebars by welds. Radius curves in the sidebars (chain savers), if present, operate on sprocket flanges known as chain-saver rims. The purpose of the chain saver is to provide additional link support to reduce barrel O.D. wear. See Figs. 3 and 4.

Pins are fixed in the sidebar pitch holes by press fits and mechanical locks to prevent rotation in the sidebar pitch holes. Pin cotters are stainless steel.

Pin material is medium carbon steel or equivalent at 302 BHN minimum. Barrels are medium carbon steel or equivalent at 229 BHN minimum. Sidebars and attachments are medium carbon steel at 229 BHN minimum.

1.1.3 Stainless Steel Fabricated Chains. Stainless steel fabricated chains consist of a series of alternating inside and outside links having barrels to contact the sprocket teeth and pins that articulate in the barrels of links. Radius curves in the sidebars (chain savers) operate on sprocket flanges known as chain-saver rims. The purpose of the chain saver is to provide additional link support to reduce barrel O.D. wear. See Fig. 5.

Pins and bushings are fixed in the sidebar pitch holes by press fit and mechanical locks to prevent rotation in the sidebar pitch holes. Pin cotters are stainless steel.

Pin, barrel, and sidebars are made from martensitic stainless steels with a minimum 13% chromium content. Pins and barrels are heat treated for resistance to elongation and barrel wear.

1.1.4 Nonmetallic (Plastic) Chains. Nonmetallic (plastic) chains consist of a series of identical offset links having barrels to contact the sprocket teeth and pins that articulate in the barrels of links. Radius curves in the sidebars (chain savers) operate on sprocket flanges known as chain-saver rims. The purpose of the chain saver is to provide additional link support to reduce barrel O.D. wear. See Fig. 6.

Pins are fixed in the sidebar pitch holes by press fit and mechanical locks to prevent rotation in the sidebar pitch holes.

Pins and links are made from a variety of plastic materials and hardness levels, depending on the manufacturer. The contour of the links and method of connecting links together are also unique to each manufacturer. No attempt will be made in this Standard to distinguish performance value of any particular design. Rather, only the dimensions necessary for function on the standard 720S tooth form, attachment bolt hole pattern, proof load, and measuring load will be established.

1.2 Dimensions for Chain Links

1.2.1 Cast and Welded Steel Chains. To assure interchangeability of links and function over the standard tooth form as produced by different manufacturers of chain, standard maximum and minimum dimensions are adopted. They are not actual dimensions used in manufacturing, but limiting dimensions required to assure desired interchangeability.

The following dimensional data can be found in this Standard for cast and welded steel chains:

(a) general chain dimensions, ultimate strengths, proof loads, strand length, and measuring loads (see Table 1 and Fig. 7)

(b) maximum and minimum controlling dimensions for interchangeability (see Table 2 and Fig. 7)

(c) the required maximum clearance dimensions (see Table 3 and Fig. 7)