

SUBJECT: Proof-testing Requirements for Special Custom Design Steel Chain and Attachments

Purpose: To clarify proof-testing requirements and alternatives under 1910.184(e).

Scope: This instruction applies MNOSHA-wide.

References:

- A. 1910.184: Slings
- B. ASTM A391/A391M – 2007 Specification for Grade 80 Alloy Steel Chain
- C. ANSI G61.1-1968-Steel Alloy Chain, this standard is no longer published but is incorporated by reference in 29 CR 1910.6
- D. CPL 02-01-014 29 CFR 1910.184(e)(4), Alloy Steel Chain Slings Proof Testing, Dated October 1, 1981.
- E. Memorandum, Associate Assistant Secretary for Regional Programs, Dated July 12, 1976, "Clarification of 1910.184."
- F. Standard Interpretation, April 11, 1988, concerning the rated capacity of alloy steel chain slings.
- G. ASME B30.9 – 2006, Slings

Cancellation: This instruction cancels STD 1-11.10 "Proof-testing Requirements for Special Custom Design Steel Chain Sling Attachments" dated September 15, 2010.

Background:

- A. 1910.184(e)(4) and 1910.184(e)(7)(i) require proof-testing of alloy steel chain slings with a certificate of the proof test retained by the employer and available for examination.
- B. Questions and complaints regarding this requirement have been received. The concern exists because of the number and the variety of devices in use and the difficulty in having them tested, particularly where facilities are not readily available.
- C. 1910.184(e)(2)(i) states: "Hooks, rings, oblong links, pear shaped links, welded or mechanical coupling links or other attachments shall have a rated capacity at least equal to that of the alloy steel chain with which they are used, or the sling shall not be used in excess of the rated capacity of the weakest component."
- D. American Society of Testing and Materials Specification A391-65, which is referenced in 1910.184(e)(4), requires proof-testing of the chain, with fittings or attachments, to 200 percent of the rated load.
- E. The ASTM revised A391 in 1986 and described a new variant of alloy steel chain in ASTM A391-86. 29 CFR 1910.184(e)(5) specifies that all slings not included in table N-184-1 shall be used in accordance with the manufacturer's recommendations. A sling made of alloy chain other than Grade 80 shall be used in accordance with the manufacturer's recommendations.
- F. ANSI B30.9 – 2006 provides guidelines for slings made from Grade 80 and Grade 100 alloy steel. ANSI B30.9 – 2006 allows other than alloy chain and components to be used where the manufacturer or qualified person provides specific data.

Action:

- A. Chain used in a sling for lifting purposes shall be alloy steel chain. Other types of chain may be used only if the manufacturer recommends the chain to be used for lifting purposes. (See STD 1-11.11)
- B. "Makeshift links or fasteners formed from bolts or rods or other such attachments shall not be used." This is stated in 1910.184(e)(2)(ii).
- C. Alloy steel chain slings utilizing special custom design grabs, clamps, or other lifting accessories:
 - 1. Shall have permanently affixed durable identification stating the rated capacity, etc., in accordance with 1910.184(e)(1);
 - 2. Shall be proof-tested prior to use to 200 percent of their rated load.
- D. Proof-testing must be done by the "sling manufacturer or equivalent entity" as stated in 1910.184(e)(4). The employer could be considered to be an equivalent entity if the sling was designed, fabricated, and tested according to ASTM A391-65 and ANSI G61.1-1968 and the proof-testing was properly documented. Employers who perform proof testing must take precautions to safeguard employees against the potential for flying or falling objects in the event of failure. The documentation must describe the method and the weight used, with a signed and dated copy retained and available for examination. Only knowledgeable engineers shall be accepted as witnesses to the proof-testing procedure.

Manufactured chains, connectors and hooks, clamps, etc., which have been tested by the manufacturer, shall be used per the manufacturer's recommendations and must not exceed the maximum rated load of any component part.

When an alloy steel chain sling is assembled with components that require welding in assembly, the completed sling must be proof tested by the sling manufacturer or equivalent entity, before the sling is used. When an alloy steel chain sling is made up of welded components which were individually proof-tested and no further welding is required to assemble the sling, the assembled alloy steel chain sling does not have to be proof tested.

Proof testing is not required when the alloy steel chain sling is made up of components not requiring welding to assemble, such as forged components. The forged components used in alloy steel chain slings are identical to the forged components used on wire rope slings, which do not require proof testing. The rated capacity for alloy steel chain slings is limited to the rated capacity of its weakest component.

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