



Designation: A 391/A 391M – 01

Standard Specification for Grade 80 Alloy Steel Chain¹

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1. Scope*

1.1 This specification covers Grade 80 heat-treated alloy steel chain for such applications as slings, lifting assemblies, and load binding.

NOTE 1—This specification does not cover alloy steel chain for pocket wheel applications.

1.2 The values stated in either SI units or in other units shall be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system must be used independently of the other, without combining values in any way.

2. Referenced Documents

2.1 ASTM Standards:

A 29/A 29M Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for²

E 30 Test Methods for Chemical Analysis of Steel, Cast Iron, Open-Hearth Iron, and Wrought Iron³

E 44 Definitions of Terms Relating to Heat Treatment of Metals⁴

E 350 Test Methods for Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron³

E 415 Test Method for Optical Emission Vacuum Spectrometric Analysis of Carbon and Low-Alloy Steel³

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *breaking force, minimum*—the minimum force in pounds or newtons at which the chain, during manufacture, has been found by testing to break when a constantly increasing force is applied in direct tension. This test is a manufacturer's attribute acceptance test and shall not be used as criteria for service.

3.1.2 *lot*—for the purpose of acceptance testing, a lot shall consist of 3000 ft [1000 m], or fraction thereof, of the same grade and size chain. If a continuous length of chain exceeds 3000 ft [1000 m], it shall also be considered a lot.

3.1.3 *proof test*—a quality control tensile test applied to chain for the purpose of verifying weld and material quality. It is the minimum force in pounds or newtons which the chain has withstood at the time it left the producer, under a test in which a constantly increasing force has been applied in direct tension to a straight length of chain. Proof test loads are a manufacturing integrity test and shall not be used as criteria for service or design purposes.

3.1.4 *working load limit (WLL)*—the maximum combined static and dynamic load in pounds or kilograms that shall be applied in direct tension to an undamaged straight length of chain.

4. Ordering Information

4.1 It shall be the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Such requirements to be considered include, but are not limited to, the following:

4.1.1 Product to conform to Specification A 391 or A 391M and year of issue,

4.1.2 Nominal size of chain in in. [mm],

4.1.3 Quantity of chain in ft [m],

4.1.4 Length of each piece, if required,

4.1.5 Finish, if required,

4.1.6 Certification of test(s), if required, and

4.1.7 Acceptance of inspection by purchaser, if required.

5. Manufacturing

5.1 *Melting Process*—The alloy steel shall be made to a fully-killed fine austenitic grain process.

5.2 *Welding Process*—Alloy steel chain may be made by the electric welding or gas welding process.

5.3 *Heat Treatment*—After welding, alloy steel chain shall be heat treated before applying the proof test. Heat treatment shall include quenching and tempering as defined by Definitions E 44.

¹ This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.27 on Steel Chain.

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² Annual Book of ASTM Standards, Vol 01.05.

³ Discontinued. See 1995 Annual Book of ASTM Standards, Vol 03.05.

⁴ Discontinued. See 1993 Annual Book of ASTM Standards, Vol 01.02.

*A Summary of Changes section appears at the end of this standard.