Designation: A 466/A 466M – 07

Standard Specification for Weldless Chain[1]

This standard is issued under the fixed designation A 466/A 466M; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification covers weldless chain suitable for applications where a light and flexible chain is required. The material may be steel, brass, or bronze.

1.2 Seven classes of chain are covered:

1.2.1 *Class SL*—Single-loop chain.

1.2.2 *Class DL*—Double-loop chain.

1.2.3 *Class SH*—Sash chain.

1.2.4 *Class SF*—Plumbers' chain.

1.2.5 *Class SJ*—Single-jack chain.

1.2.6 *Class DJ*—Double-jack chain.

1.2.7 *Class RG*—Register chain.

1.3 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:* [2]

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

A 366/A 366M Specification for Commercial Steel (CS) Sheet, Carbon (0.15 Maximum Percent) Cold-Rolled[3]

A 569/A 569M Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial[3]

B 248 Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *breaking force, minimum*, *n*—minimum force in pounds or newtons at which the chain, during manufacture, has been found by representative testing to break when a constantly increasing force is applied in direct tension.

3.1.1.1 *Discussion*—This test is a manufacturer's attribute acceptance test and shall not be used as criteria for service.

3.1.2 *lot*, *n*—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, it shall also be considered a lot.

3.1.3 *working load limit (WLL)*, *n*—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 466/A 466M and year of issue,

4.1.2 Class of chain,

4.1.3 Material size or trade size of chain,

4.1.4 Material of chain (steel, brass, or bronze),

4.1.5 Quantity of chain in feet [metres],

4.1.6 Length of each piece, if required,

[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.

Current edition approved Nov. 1, 2007. Published November 2007. Originally approved in 1962. Last previous edition approved in 2001 as A 466/A 466M – 01.

[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Withdrawn.

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

Copyright © ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States.

Copyright ASTM International
Provided by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale

4.1.7 Finish, if required,
4.1.8 Certification of test(s), if required, and
4.1.9 Acceptance of inspection by purchaser, if required.

5. Materials and Manufacture

5.1 The selection of the base material is left to the judgment of the individual chain manufacturer provided that the chain complies with the requirements contained within this specification.

5.2 The methods utilized to produce the chain are left to the judgment of the individual chain manufacturer provided the chain complies with the requirements contained within this specification.

6. Dimensional Requirements

6.1 The chain shall conform to the dimensional requirements as specified in Tables 1-7. The tolerance is ±7 % from the specified nominal dimensions for all chain classes except Class SF. Class SF has a maximum length criterion. The inside length dimension can be measured either by individual link or by measuring the span of 100 links and dividing by 100.

6.2 *Material Diameter/Thickness*—The diameter or thickness of the material from which the chain is manufactured shall be at least the dimension shown in Tables 1-7, subject to the normal commercial tolerances listed in Specifications A 29/A 29M, A 366/A 366M, A 569/A 569M, and B 248. Oversized material may be used for all applications.

7. Finish

7.1 The manufacturers may apply a surface treatment or finish of their own choice for identification or corrosion resistance unless otherwise specified by the customer in the purchase order. The surface treatment or finish shall not alter the chain in a manner that would cause the chain to not meet the other provisions of this standard.

8. Mechanical Requirements

8.1 *Breaking Force Test*:

8.1.1 The breaking force test specimen shall consist of a length not less than 1 ft [0.3 m] from the lot of chain.

8.1.2 Fixtures for securing chain in a testing machine shall be properly designed to securely support the shoulder of the link. The opening in the fixture shall be not more than 25 % larger than the material diameter of the chain being tested. Links in the testing fixture shall not be considered part of the test specimen.

8.1.3 Test specimens shall conform to the minimum breaking requirements as prescribed in Tables 1-7 for their respective sizes and classes.

8.1.4 *Number of Tests*—The manufacturer shall perform at least one test per lot of chain.

9. Retests

9.1 If the original test specimen fails to conform to the minimum breaking force requirements of 6.1.4, two additional test specimens from the same lot may be tested. If both additional specimens conform to the minimum breaking force requirements, the chain will be considered acceptable.

10. Rework and Retreatment

10.1 Materials that fail to comply to the requirements for dimensions and mechanical tests may be resubmitted after being reworked.

11. Inspection

11.1 Prior to testing and inspection at the manufacturer's plant, the chain shall be free of paint or other coatings which would tend to conceal defects.

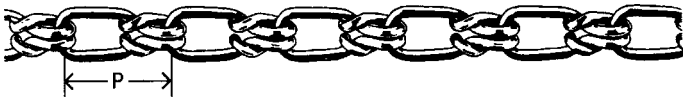
11.2 The manufacturer shall afford the purchaser's inspector all reasonable facilities necessary to satisfy him that the material is being produced and furnished in accordance with this specification. Mill inspection by the purchaser shall not interfere unnecessarily with the manufacturer's operations. All tests and inspections shall be made at the place of manufacture, unless otherwise agreed.

11.3 The purchaser may make tests to govern the acceptance or rejection of the material at his own laboratory or elsewhere. The tests shall be made at the expense of the purchaser.

12. Rejection and Rehearing

12.1 Unless otherwise specified, any rejection based on tests made in accordance with 11.3 shall be reported to the manufacturer within five working days from the date of testing by the purchaser.

TABLE 1 Single Loop Chain (Class SL)

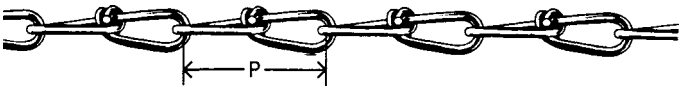


Trade Size	Material Size, in. [mm]	Nominal Inside Length (P) in. [mm]	Approximate Weight per 100 ft [30.5 m], lb [kg]	Working Load Limit, lb [kg]		Minimum Breaking Force, lb [kN][A]	
				Steel	Brass	Steel	Brass
2	0.091 [2.3]	1.08 [27.4]	10.0 [5]	155 [70]	110 [50]	620 [2.8]	440 [2.0]
1/0	0.120 [3.0]	1.29 [32.8]	17.0 [8]	265 [120]	185 [84]	1060 [4.7]	740 [3.3]
2/0	0.135 [3.4]	1.48 [37.6]	22.0 [10]	340 [154]	240 [109]	1360 [6.0]	960 [4.3]
3/0	0.148 [3.8]	1.63 [41.4]	26.0 [12]	405 [184]	285 [129]	1620 [7.2]	1140 [5.1]
4/0	0.162 [4.1]	1.80 [45.7]	31.0 [14]	485 [220]	340 [154]	1940 [8.6]	1360 [6.0]
5/0	0.177 [4.5]	2.15 [54.6]	35.0 [16]	580 [263]	405 [184]	2320 [10.3]	1620 [7.2]

[A] The minimum breaking force values shall not be used as criteria for service or design purposes. (See Section 3.)

Copyright ASTM International
Provided by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale

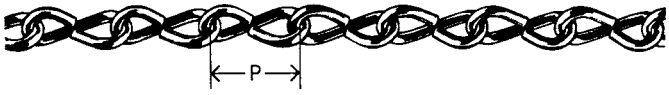
TABLE 2 Double Loop Chain (Class DL)



Trade Size	Material Size, in. [mm]	Nominal Inside Length(P) in. [mm]	Approximate Weight per 100 ft [30.5 m], lb [kg]	Working Load Limit, lb [kg]		Minimum Breaking Force, lb [kN][A]	
				Steel	Brass	Steel	Brass
5	0.062 [1.6]	0.92 [23.4]	3.6 [2]	55 [25]	40 [18]	220 [1.0]	160 [0.7]
4	0.072 [1.8]	1.00 [25.4]	4.7 [2]	70 [32]	50 [23]	280 [1.2]	200 [0.9]
3	0.080 [2.0]	1.10 [27.9]	5.9 [3]	90 [41]	65 [29]	360 [1.6]	260 [1.2]
2	0.091 [2.3]	1.33 [33.8]	7.7 [4]	115 [52]	80 [36]	460 [2.0]	320 [1.4]
1	0.105 [2.7]	1.54 [39.1]	10.0 [5]	155 [70]	110 [50]	620 [2.8]	440 [2.0]
1*L*[B]	0.105 [2.7]	2.03 [51.6]	9.0 [4]	155 [70]	110 [50]	620 [2.8]	440 [2.0]
1/0	0.120 [3.0]	1.78 [45.2]	13.0 [6]	200 [91]	140 [63]	800 [3.6]	560 [2.5]
1/0*L*[B]	0.120 [3.0]	2.24 [56.9]	12.0 [5]	200 [91]	140 [63]	800 [3.6]	560 [2.5]
2/0	0.135 [3.4]	1.82 [46.2]	17.0 [8]	255 [116]	180 [82]	1020 [4.5]	720 [3.2]
2/0*L*[B]	0.135 [3.4]	2.24 [56.9]	16.0 [7]	255 [116]	180 [82]	1020 [4.5]	720 [3.2]
3/0	0.148 [3.8]	2.17 [55.1]	20.0 [9]	305 [138]	215 [98]	1220 [5.4]	860 [3.8]
4/0	0.162 [4.1]	2.19 [55.6]	25.0 [11]	365 [166]	255 [116]	1460 [6.5]	1020 [4.5]
6/0	0.192 [4.9]	2.96 [73.8]	34.0 [15]	510 [232]	355 [161]	2040 [9.1]	1420 [6.3]
8/0	0.225 [5.7]	2.90 [73.7]	51.0 [23]	705 [320]	500 [227]	2820 [12.5]	2000 [8.9]

[A] The minimum breaking force valves shall not be used as criteria for service or design purposes. (See Section 3.)
[B] *L* signifies *long link* construction.

TABLE 3 Single Jack Chain (Class SJ)



Trade Size	Material Size, in. [mm]	Nominal Inside Length (P) in. [mm]	Approximate Weight per 100 ft [30.5 m], lb [kg]	Working Load Limit, lb [kg]		Minimum Breaking Force, lb [kN][A]	
				Steel	Brass	Steel	Brass
20	0.034 [0.9]	0.30 [7.6]	1.0 [1]	3 [1]	2 [1]	12 [0.1]	8 [0.1]
18	0.047 [1.2]	0.39 [9.9]	1.7 [1]	5 [2]	4 [2]	20 [0.1]	15 [0.1]
16	0.062 [1.6]	0.50 [12.7]	2.9 [1]	10 [5]	8 [4]	40 [0.2]	30 [0.1]
14	0.080 [2.0]	0.63 [16.0]	4.8 [2]	16 [7]	11 [5]	65 [0.3]	45 [0.2]
12	0.105 [2.7]	0.75 [19.1]	8.5 [4]	29 [13]	20 [9]	115 [0.5]	80 [0.4]
10	0.135 [3.4]	0.93 [23.6]	14.0 [6]	43 [20]	34 [15]	170 [0.8]	135 [0.6]
8	0.162 [4.1]	1.09 [27.7]	21.0 [10]	60 [27]	43 [20]	240 [1.1]	170 [0.8]
6	0.192 [4.9]	1.24 [31.5]	30.0 [14]	88 [40]	66 [30]	350 [1.6]	265 [1.2]

[A] The minimum breaking force values shall not be used as criteria for service or design purposes. (See Section 3.)

TABLE 4 Double Jack Chain (Class DJ)

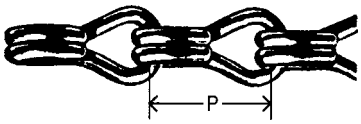


Trade Size	Material Size, in. [mm]	Nominal Inside Length (P) in. [mm]	Approximate Weight per 100 ft [30.5 m], lb [kg]	Working Load Limit, lb [kg]		Minimum Breaking Force, lb [kN][A]	
				Steel	Brass	Steel	Brass
16	0.062 [1.6]	0.34 [8.6]	4.0 [2]	11 [5]	8 [4]	45 [0.2]	30 [0.1]

[A] The minimum breaking force values shall not be used as criteria for service or design purposes. (See Section 3.)

Copyright ASTM International
Provided by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale

TABLE 5 Register Chain (Class RG)



Trade Size	Material Size, in. [mm]	Nominal Inside Length (P) in. [mm]	Approximate Weight per 100 ft [30.5 m], lb [kg]	Working Load Limit, lb [kg]		Minimum Breaking Force, lb [kN][A]	
				Steel	Brass	Steel	Brass
18	0.047 [1.2]	0.39 [9.9]	2.7 [1]	9 [4]	5 [2]	35 [0.2]	20 [0.1]
12	0.105 [2.7]	0.80 [20.3]	15.0 [7]	50 [23]	35 [16]	200 [0.9]	140 [0.6]
10	0.135 [3.4]	1.02 [25.9]	19.0 [9]	83 [38]	58 [26]	330 [1.5]	230 [1.0]

[A] The minimum breaking force values shall not be used as criteria for service or design purposes. (See Section 3.)

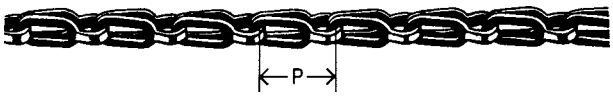
TABLE 6 Sash Chain (Class SH)[A]



Trade Size	Material Size, in. [mm]	Nominal Inside Length (P) in. [mm]	Approximate Weight per 100 ft [30.5 m], lb [kg]	Working Load Limit, lb [kg]		Minimum Breaking Force, lb [kN][B]	
				Steel	Brass	Steel	Brass
8	0.035 [0.9]	0.56 [14.1]	3.9 [2]	75 [34]	68 [31]	300 [1.3]	270 [1.2]
25	0.042 [1.1]	0.56 [14.1]	4.9 [2]	94 [43]	80 [36]	375 [1.7]	320 [1.4]
30	0.028 [0.7]	0.57 [14.4]	4.9 [2]	81 [37]	75 [34]	325 [1.4]	300 [1.3]
35	0.035 [0.9]	0.57 [14.4]	5.7 [3]	106 [48]	100 [45]	425 [1.9]	400 [1.8]
40	0.042 [1.1]	0.57 [14.4]	7.0 [3]	131 [59]	125 [57]	525 [2.3]	500 [2.2]
45	0.050 [1.3]	0.57 [14.4]	8.7 [4]	175 [79]	163 [74]	700 [3.1]	650 [2.9]
50	0.060 [1.5]	0.65 [16.5]	12.0 [5]	225 [102]	210 [95]	900 [4.0]	840 [3.7]
60	0.062 [1.6]	0.76 [19.3]	15.0 [7]	231 [105]	225 [102]	925 [4.1]	900 [4.0]
65	0.072 [1.8]	0.88 [22.2]	19.0 [9]	319 [145]	300 [136]	1275 [5.7]	1200 [5.3]

[A] For bronze sash chain, all values in this table are the same as those shown for brass sash chain.
[B] The minimum breaking force values shall not be used as criteria for service or design purposes. (See Section 3.)

TABLE 7 Plumbers' Chain (Class SF)



Trade Size	Material Size, in. [mm]	Nominal Inside Length (P) in. [mm][A]	Approximate Weight per 100 ft [30.5 m], lb [kg]	Working Load Limit, lb [kg]		Minimum Breaking Force, lb [kN][B]	
				Steel	Brass	Steel	Brass
2/0	0.018 [0.5]	0.60 [15.3]	1.4 [1]	31 [14]	23 [10]	125 [0.5]	90 [0.4]
1/0	0.023 [0.6]	0.60 [15.3]	2.0 [1]	40 [18]	35 [16]	160 [0.7]	140 [0.6]
1	0.028 [0.7]	0.70 [17.8]	3.3 [2]	58 [26]	45 [20]	230 [1.0]	180 [0.8]

[A] Lengths specified for plumbers' chain are maximums.
[B] The minimum breaking force values shall not be used as criteria for service or design purposes. (See Section 3.)

12.2 Chains tested in accordance with 11.3 that represent rejected material shall be preserved for two weeks from the date of the test report. In case of dissatisfaction with the results of the tests, the manufacturer may make claim for a rehearing within that time.

13. Certification and Reports

13.1 A manufacturer's certification that the chain conforms to Specification A 466/A 466M of the date of issue specified shall be furnished when requested on the purchase order or contract.

14. Keywords

14.1 steel chain; weldless steel chain

--`,,```,,,,````-`-`,,`,,`,`,,`---

Copyright ASTM International
Provided by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale

SUMMARY OF CHANGES

Committee A01 has identified the location of selected changes to this standard since the last issue (A 466/A 466M – 01) that may impact the use of this standard. (Approved Nov. 1, 2007.)

(*1*) Revised Section 7.

(*2*) Revised 1.2.4 and the title of Table 7.

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org).

Copyright ASTM International
Provided by IHS under license with ASTM
No reproduction or networking permitted without license from IHS
Not for Resale