



Designation: A 466/A 466M – 01

## Standard Specification for Weldless Chain<sup>1</sup>

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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

*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' (safety) 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*:

A 29/A 29M Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for<sup>2</sup>

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

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

B 248 Specification for General Requirements for Wrought Copper and Copper-Alloy Plate, Sheet, Strip, and Rolled Bar<sup>4</sup>

### 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 representative 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, it shall also be considered a lot.

3.1.3 *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 466 or 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,

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  $\pm 7\%$  from the specified nominal dimensions for all chain classes except

<sup>1</sup> 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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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 01.05.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 01.03.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 02.01.

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

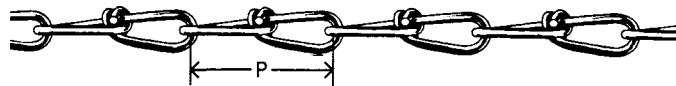
**TABLE 1 Single Loop Chain (Class SL)**



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] <sup>A</sup>	
				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]

<sup>A</sup> The minimum breaking force values shall not be used as criteria for service or design purposes. (See Section 3.)

**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] <sup>A</sup>	
				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]
1L <sup>B</sup>	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]
1/0L <sup>B</sup>	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]
2/0L <sup>B</sup>	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]

<sup>A</sup> The minimum breaking force valves shall not be used as criteria for service or design purposes. (See Section 3.)

<sup>B</sup> L signifies *long link* construction.

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. Workmanship, Finish and Appearance

7.1 The chain shall be free of injurious imperfections and shall have a workmanlike finish.

7.2 The manufacturers may apply a surface treatment or coating of their own choice for identification or corrosion resistance unless otherwise specified by the customer in the purchase order.

## 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.