Designation: A 865/A 865M – 06

# Standard Specification for Threaded Couplings, Steel, Black or Zinc-Coated (Galvanized) Welded or Seamless, for Use in Steel Pipe Joints[1]

This standard is issued under the fixed designation A 865/A 865M; 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.

## 1. Scope*

1.1 This specification covers black or galvanized welded or seamless threaded steel couplings for use with steel pipe in NPS ⅛ to NPS 20 [DN 6 to DN 500] inclusive (Note 1). Couplings ordered under this specification are intended for the uses outlined in the pipe specifications referencing this specification.

NOTE 1—The dimensionless designator NPS (nominal pipe size) and DN [diameter nominal] has been substituted in this standard for such traditional terms as nominal diameter, size, and nominal size.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

## 2. Referenced Documents

2.1 *ASTM Standards:* [2]

A 700 Practices for Packaging, Marking, and Loading Methods for Steel Products for Shipment

B 6 Specification for Zinc

E 376 Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Examination Methods

2.2 *ANSI Standard:*

B 1.20.1 Pipe Threads[3]

2.3 *API Standards:*

5B Specification for Threading, Gaging, and Thread Inspection of Casing, Tubing, and Line Pipe Threads[4]

5L Specification for Line Pipe[4]

## 3. Ordering Information

3.1 Orders for material under this specification should include the following, as required, to describe the desired material adequately:

3.1.1 Specification number,

3.1.2 Quantity (pieces),

3.1.3 Name of material (steel pipe-couplings),

3.1.4 Method of manufacture (welded or seamless),

3.1.5 Finish (black or Type I or Type II) galvanized (see 8.1),

3.1.6 Size (NPS designator [DN]),

3.1.7 Standard or extra-strong classification,

3.1.8 Taper tapped-couplings for NPS 2 [DN 50] and smaller, either recessed or non-recessed, if desired, and

3.1.9 Certification (see 11.3), if required.

## 4. Process

4.1 The steel for both welded and seamless couplings shall be made by one or more of the following processes: open-hearth, electric-furnace, or basic-oxygen.

4.2 Welded couplings NPS 3 ½ [DN 90] and under may be butt-welded, unless otherwise specified. Welded couplings over NPS 3 ½ [DN 90] shall be electric-welded.

## 5. Chemical Composition

5.1 The steel shall conform to the chemical composition requirements as specified in Table 1.

## 6. Dimensions

6.1 Coupling dimensions are listed in Tables 2-4 and Figs. 1-3.

[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 A01.09 on Carbon Steel Tubular Products.

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[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] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

[4] Available from American Petroleum Institute (API), 1220 L. St., NW, Washington, DC 20005.

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

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TABLE 1 Chemical Requirements

| | Composition, max % | |
|---|---|---|
| | Phosphorus | Sulfur |
| All processes | 0.14 | 0.35 |

## 7. Permissible Variations in Dimensions

7.1 *Diameter*—For couplings NPS 1 ½ [DN 40] and under, the outside diameter at any point shall not vary more than 1/64 in. [0.4 mm] over nor more than 1/32 in. [0.8 mm] under the standard specified. For couplings NPS 2 [DN 50] and over, the outside diameter shall not vary more than ±1 % from the standard specified.

7.2 *Threads*—The variation of the threads shall not exceed ±1 ½ turns for straight tapped and ±1 turn for taper tapped from nominal as determined using gages and the gaging practices in ANSI B 1.20.1.

## 8. Galvanized Couplings

8.1 Galvanized couplings may be coated with zinc by either the hot-dipped (Type 1) or by the electrogalvanizing process. (Type II) as specified by the purchaser. The zinc used for the coating shall be any grade of zinc conforming to Specification B 6.

8.2 Hot-dipped galvanized couplings are coated prior to threading.

8.2.1 The minimum weight of the zinc coating on the outside surface of the hot-dipped galvanized couplings shall be equivalent to 1.6 oz/ft$^2$ [490 g/m$^2$].

8.2.2 The weight of the zinc coating on the outside surface shall be determined by the use of a magnetic thickness gage, using the procedure in Practice E 376 or using another method that is mutually agreed upon between the purchaser and the manufacturer.

8.3 Electrogalvanized couplings are coated either before or after threading.

8.3.1 The weight of the zinc coating on the outside surface of the electrogalvanized couplings shall be equivalent to 0.18 oz/ft$^2$ [55 g/m$^2$] (see also 8.2.2)

8.4 *Sampling*—Samples of couplings sufficient to determine their conformance with the requirements of this specification, shall be taken at random for each lot of couplings of the same size.

## 9. Threading

9.1 The coupling threads shall be in accordance with ANSI B 1.20.1. The couplings shall be applied handling tight, unless power tight is specified on the order. Taper-tapped couplings shall be furnished on all weights of pipe NPS 2 ½ [DN 65] and larger. For sizes NPS 2 [DN 50] and smaller, it is regular practice to furnish straight-tapped couplings for standard weight pipe and taper-tapped couplings for extra-strong and double-extra-strong pipe. Taper-tapped couplings may be specified for pipe sizes NPS 2 [DN 50] and under. Taper-tapped couplings furnished for standard-weight pipe may be nonrecessed (see Table 3) or recessed (see Table 4). Couplings furnished for extra-strong and double-extra strong pipe are recessed. Recessed couplings (Table 4) conform to API Specification 5L.

## 10. Finish

10.1 The finished couplings shall be free of defects.

10.2 The zinc coating on galvanized couplings shall be free of voids or excessive roughness.

## 11. Inspection and Certification

11.1 The inspector representing the purchaser shall have entry, at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works that concern the manufacture of the material ordered. The manufacturer shall afford the inspector all reasonable facilities to satisfy him that the material is being furnished in accordance with this specification. All tests and inspection shall be made at the place of manufacture prior to shipment, unless otherwise specified, and shall be so conducted as not to interfere unnecessarily with the operation of the works.

11.2 *Responsibility for Inspection*—Unless otherwise specified in the contract or purchase order, the manufacturer is responsible for the performance of all inspection and test requirements specified herein. Except as specified in the contract order, the producer may use his own or any other suitable facilities for the performance of the inspection and test requirements specified herein unless disapproved by the purchaser. The purchaser shall have the right to perform any of the inspections and tests set forth in this specification where such inspections are deemed necessary to assure that material conforms to prescribed requirements.

11.3 The manufacturer or supplier shall upon request, furnish to the purchaser a certificate of inspection stating that the material has been sampled, tested, and inspected in accordance with this specification, and has been found to meet the requirements.

## 12. Rejection

12.1 Each coupling received from the manufacturer may be inspected by the purchaser and, if it does not meet the requirements of this specification based upon the inspection, the coupling may be rejected and the manufacturer shall be notified. Disposition of rejected couplings shall be the matter of agreement between the manufacturer and the purchaser.

## 13. Product Marking and Packing

13.1 Each coupling shall be marked with the trademark of the manufacturer by metal stamp or paint.

13.2 The cartons in which the couplings are packed shall bear the manufacturer's name or trademark, the NPS [DN] designator, the finish (black or galvanized), and the number of pieces.

13.3 When specified on the purchase order, packaging, marking, and loading for shipment shall be in accordance with Practice A 700.

13.4 *Bar Coding*—In addition to the requirements in 13.1, 13.2, and 13.3, bar coding is acceptable as a supplemental identification method. The purchaser may specify in the order a specific bar coding system to be used.

## 14. Keywords

14.1 black steel pipe; seamless steel pipe; steel pipe; welded steel pipe; zinc coated steel pipe



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**TABLE 2 Coupling Thread Dimension—Straight-Tapped (NPSC) for Standard Weight Pipe**

| NPS Designator | DN Designator | Threads/in. | Outside diameter, in. [mm] *W* | Coupling min length, in. [mm] $N_L$ | Pitch diameter, in. [mm] | |
|---|---|---|---|---|---|---|
| | | | | | min | max |
| ⅛ | 6 | 27 | 0.563 [14.3] | ¾ [19] | 0.370 [9.4] | 0.377 [9.6] |
| ¼ | 8 | 18 | 0.719 [18.3] | 1⅛ [29] | 0.486 [12.3] | 0.497 [12.6] |
| ⅜ | 10 | 18 | 0.875 [22.2] | 1⅛ [29] | 0.622 [15.8] | 0.632 [16.1] |
| ½ | 15 | 14 | 1.063 [27.0] | 1½ [38] | 0.772 [19.6] | 0.785 [19.9] |
| ¾ | 20 | 14 | 1.313 [33.4] | 1⁹⁄₁₆ [40] | 0.982 [24.9] | 0.996 [25.3] |
| 1 | 25 | 11½ | 1.576 [40.0] | 1¹⁵⁄₁₆ [49] | 1.231 [31.3] | 1.247 [31.7] |
| 1¼ | 32 | 11½ | 1.900 [48.3] | 2 [50] | 1.575 [40.0] | 1.592 [40.4] |
| 1½ | 40 | 11½ | 2.200 [55.9] | 2 [50] | 1.814 [46.1] | 1.831 [46.5] |
| 2 | 50 | 11½ | 2.750 [69.8] | 2¹⁄₁₆ [52] | 2.288 [58.1] | 2.304 [58.5] |
| | | Outside diameter tolerances: | For NPS 1 ½ [DN 40] and under | | +0.015 in. [0.4 mm] −0.031 in. [0.8 mm] | |
| | | | For NPS 2 [DN 50] and over | | ±1 % | |

**TABLE 3 Coupling Thread Dimensions—Taper-Tapped (NPT) Non-Recessed for Standard-Weight Pipe**

| NPS Designator | DN Designator | Threads/in. | Outside diameter, in. [mm] *W* | Coupling min length, in. [mm] $N_L$ | Pitch diameter, in. [mm] ($E_1$) Handtight engagement |
|---|---|---|---|---|---|
| ⅛ | 6 | 27 | 0.563 [14.3] | ¾ [19] | 0.3736 [9.49] |
| ¼ | 8 | 18 | 0.719 [18.3] | 1⅛ [29] | 0.4916 [12.49] |
| ⅜ | 10 | 18 | 0.875 [22.2] | 1⅛ [29] | 0.6270 [15.93] |
| ½ | 15 | 14 | 1.063 [27.0] | 1½ [38] | 0.7784 [19.77] |
| ¾ | 20 | 14 | 1.313 [33.4] | 1⁹⁄₁₆ [40] | 0.9889 [25.12] |
| 1 | 25 | 11½ | 1.576 [40.0] | 1¹⁵⁄₁₆ [49] | 1.2386 [31.46] |
| 1¼ | 32 | 11½ | 1.900 [48.3] | 2 [50] | 1.5834 [40.22] |
| 1½ | 40 | 11½ | 2.200 [55.9] | 2 [50] | 1.8223 [46.29] |
| 2 | 50 | 11½ | 2.750 [69.8] | 2¹⁄₁₆ [52] | 2.2963 [58.33] |
| 2½ | 65 | 8 | 3.250 [82.5] | 3¹⁄₁₆ [78] | 2.7622 [70.16] |
| 3 | 80 | 8 | 4.000 [101.6] | 3³⁄₁₆ [81] | 3.3885 [86.07] |
| 3½ | 90 | 8 | 4.625 [117.5] | 3⁵⁄₁₆ [84] | 3.8888 [98.78] |
| 4 | 100 | 8 | 5.000 [127.0] | 3⁷⁄₁₆ [87] | 4.3871 [111.43] |
| 5 | 125 | 8 | 6.296 [159.9] | 3¹¹⁄₁₆ [94] | 5.4493 [138.41] |
| 6 | 150 | 8 | 7.390 [187.7] | 3¹⁵⁄₁₆ [100] | 6.5060 [165.25] |
| | | Outside diameter tolerances: | For NPS 1½ [DN 40] and under | | +0.015 in. [0.4 mm] −0.031 in. [0.8 mm] |
| | | | For NPS 2 [DN 50] and over | | ±1 % |



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**TABLE 4 Coupling Thread Dimensions—Taper-Tapped (NPT) Recessed for Extra-Strong and Double-Extra-Strong Pipe (Dimensions conform to Line Pipe Couplings in accordance with API 5L)[A]**

| NPS Designator | DN Designator | Threads/in. | Outside diameter, in. [mm] *W* | Coupling min length, in. [mm] $N_L$ | Pitch diameter in. [mm] ($E_1$) Handtight engagement |
|---|---|---|---|---|---|
| ⅛ | 6 | 27 | 0.563 [14.3] | 1 1/16 [27] | 0.3736 [9.49] |
| ¼ | 8 | 18 | 0.719 [18.3] | 1⅝ [41] | 0.4916 [12.49] |
| ⅜ | 10 | 18 | 0.875 [22.2] | 1⅝ [41] | 0.6270 [15.93] |
| ½ | 15 | 14 | 1.063 [27.0] | 2⅛ [54] | 0.7784 [19.77] |
| ¾ | 20 | 14 | 1.313 [33.4] | 2⅛ [54] | 0.9889 [25.12] |
| 1 | 25 | 11½ | 1.576 [40.0] | 2⅝ [67] | 1.2386 [31.46] |
| 1¼ | 32 | 11½ | 2.054 [52.2] | 2¾ [70] | 1.5834 [40.22] |
| 1½ | 40 | 11½ | 2.200 [55.9] | 2¾ [70] | 1.8223 [46.29] |
| 2 | 50 | 11½ | 2.875 [73.0] | 2⅞ [73] | 2.2963 [58.33] |
| 2½ | 65 | 8 | 3.375 [85.7] | 4⅛ [105] | 2.7622 [70.16] |
| 3 | 80 | 8 | 4.000 [101.6] | 4¼ [108] | 3.3885 [86.07] |
| 3½ | 90 | 8 | 4.625 [117.5] | 4⅜ [111] | 3.8888 [98.78] |
| 4 | 100 | 8 | 5.200 [132.1] | 4½ [114] | 4.3871 [111.43] |
| 5 | 125 | 8 | 6.296 [159.9] | 4⅝ [117] | 5.4493 [138.41] |
| 6 | 150 | 8 | 7.390 [187.7] | 4⅞ [124] | 6.5060 [165.25] |
| 8 | 200 | 8 | 9.625 [244.5] | 5¼ [133] | 8.5000 [215.90] |
| 10 | 250 | 8 | 11.750 [298.5] | 5¾ [146] | 10.6209 [269.77] |
| 12 | 300 | 8 | 14.000 [355.6] | 6⅛ [156] | 12.6178 [320.49] |
| 14 | 350 | 8 | 15.000 [381.0] | 6⅜ [162] | 13.8726 [352.36] |
| 16 | 400 | 8 | 17.000 [431.8] | 6¾ [171] | 15.8758 [403.25] |
| 18 | 450 | 8 | 19.000 [482.6] | 7⅛ [181] | 17.8750 [454.03] |
| 20 | 500 | 8 | 21.000 [533.4] | 7⅝ [194] | 19.8703 [504.71] |
| | Outside diameter tolerances: | For NPS 1½ [DN 40] and under | | +0.015 in. [0.4 mm] –0.031 in. [0.8 mm] | |
| | | For NPS 2 [DN 50] and over | | ±1 % | |
| | Stand off tolerances: | | | ±1 thread | |

[A] Refer to API 5B for Threading and Gaging Practice.

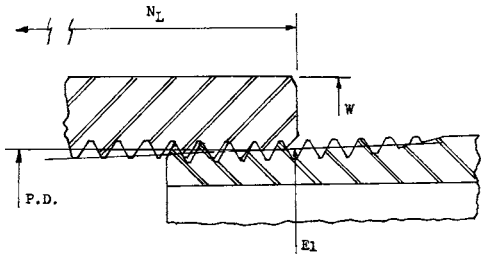



**FIG. 1 Straight-Tapped Coupling and Pipe (See Table 2 for Coupling Dimensions)**

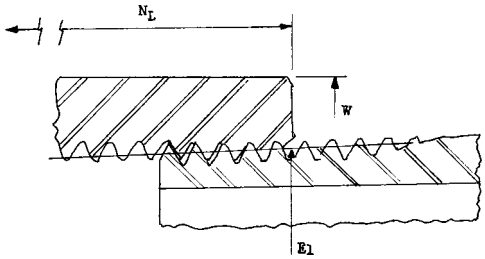



**FIG. 2 Nonrecessed Taper-Tapped Coupling and Pipe (See Table 3 for Coupling Dimensions)**



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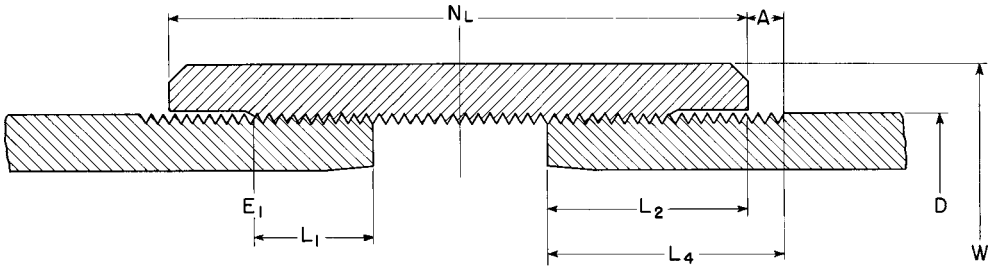



**FIG. 3 Recessed Taper-Tapped Coupling and Pipe (See Table 4 for Coupling Dimensions)**

## SUMMARY OF CHANGES

Committee A01 has identified the location of selected changes to this specification since the last issue, A 865 – 03, that may impact the use of this specification. (Approved July 2006)

(*1*) Revised all applicable sections of the specification to include metrics, creating a dual unit specification.

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