



# F.W. WEBB COMPANY

## Pipe Specification A106

|   |   |              |              |              |
|---|---|--------------|--------------|--------------|
| <b>Specification</b>                              | A106 NPS 1/8 -- 48 ANSI Schedules to 160  |              |              |              |
| <b>Scope</b>                                      | Covers SEAMLESS carbon steel nominal wall pipe for high-temperature service, suitable for bending, flanging and similar forming operations.<br>NPS 1 1/2 and under may be either hot finished or cold drawn. NPS 2 and larger shall be hot finished unless otherwise specified.                     |              |              |              |
| <b>Kinds of Steel Permitted For Pipe Material</b> | Killed Steel<br>Open-hearth<br>Electric-furnace<br>Basic-oxygen   |              |              |              |
| <b>Hot-Dipped Galvanizing</b>                     | Not covered in specification.   |              |              |              |
| <b>Permissible Variations in Wall Thickness</b>   | The minimum wall thickness at any point shall not be more than 12.5% under the nominal wall thickness specified.  |              |              |              |
| <b>Chemical Requirements</b>                      |   | Grade A      | Grade B      | Grade C      |
|   | Carbon max. %   | 0.25         | 0.30         | 0.35         |
|   | Manganese %   | 0.27 to 0.93 | 0.29 to 1.06 | 0.29 to 1.06 |
|   | Phosphorous, max. %   | 0.025        | 0.025        | 0.025        |
|   | Sulfur, max. %  | 0.025        | 0.025        | 0.025        |
|   | Silicon, min. %   | 0.10         | 0.10         | 0.10         |
| <b>Tensile Requirements</b>                       | <b>Seamless</b>   |              |              |              |
|   |   | Grade A      | Grade B      | Grade C      |
|   | Tensile Strength, min., psi   | 48,000       | 60,000       | 70,000       |
|   | Yield Strength, min., psi   | 30,000       | 35,000       | 40,000       |
| <b>Hydrostatic Testing</b>                        | Inspection test pressures produce a stress in the pipe wall equal to 60% or specified minimum yield strength (SMYS) at room temperature.<br>Maximum Pressures are not to exceed 2500 psi for NPS 3 and under and 2800 psi for the larger sizes. Pressure is maintained for not less than 5 seconds. |              |              |              |
| <b>Permissible Variations in Weights per Foot</b> | Weight of any length shall not vary more than 10% over and 3.5% under that specified. NOTE - NPS 4 and smaller - weighed in lots. Larger sizes - by length  |              |              |              |
| <b>Permissible Variations in Outside Diameter</b> | Outside Diameter at any point shall not vary from standard specified more than -  |              |              |              |
|   | NPS   | Over         | Under        |              |
|   | 1 1/2 and smaller   | 1/64"        | 1/32"        |              |
|   | 2 -- 4  | 1/32"        | 1/32"        |              |
|   | 5 -- 8  | 1/16"        | 1/32"        |              |
|   | 10 -- 18  | 3/32"        | 1/32"        |              |
|   | 20 -- 26  | 1/8"         | 1/32"        |              |



# F.W. WEBB COMPANY

**Mechanical Tests Specified**

**Tensile Test** - NPS 8 and larger - either transverse or longitudinal acceptable  
**Smaller than NPS 8** -- weighed in lots. Larger sizes -- by length.  
**Flattening Test** - NPS 2 and larger.  
**Bending Test(Cold)** - NPS 2 and under.  
**For normal A106 uses:**  
 Degree of Bend = 90  
 Diameter of Mandrel = 12 x nom. dia. of pipe  
**For close coiling:**  
 Degree of Bend = 180  
 Diameter of Mandrel = 8 x nom. diameter of pipe

**Number of Tests Required**

|            | NPS           | On One Length From Each Lot of |
|------------|---------------|--------------------------------|
| Tensile    | 5 and smaller | 400 or less                    |
|            | 6 and larger  | 200 or less                    |
| Bonding    | 2 and smaller | 400 or less                    |
| Flattening | 2 through 5   | 400 or less                    |
|            | 6 and over    | 200 or less                    |

**Lengths**

Lengths required shall be specified on order. No "jointers" permitted unless otherwise specified. If no definite lengths required, following practice applies:  
 Single Random -- 16' - 22'. 5% may be 12' - 16'  
 Double Random -- Minimum length 22', Minimum average 35'. 5% may be 16' - 22'.

**Required Markings on Each Length (On Tags attached to each Bundle in case of Bundled Pipe)**

- Rolled Stamped or Stenciled (Mfrs. option)
- Manufacturer's name or brand.
  - Length of pipe.
  - A106 A, A106 B, A106 C. ANSI schedule number.
  - Hydrostatic test pressure and/or NDE or NH if neither is specified
  - Weight per foot (NPS 4 and larger)
  - Additional "S" if tested supplementary requirements.

**General Information**

- \* Unless otherwise specified, pipe furnished with plain ends.
- \* Purchaser may specify NDE in lieu of hydrostatic test or neither.
- \* Surface finish standards are outlined in specification.



F.W. WEBB COMPANY

# ASTM A 106 Seamless Pressure Pipe Grades A & B

## Submittal Data

### Scope

Covers seamless carbon steel Grades A & B pipe for high pressure and high temperature service. Pipe is suitable for bending, flanging, and similar forming operations and for welding. Applications include: Refineries, Power Plants, Boilers, Ship Building, and other specialized applications.

### Heat Treatment

Hot-finished pipe need not be heat treated. Cold-drawn pipe shall be heat treated after the final cold draw pass at a temperature of 1200°F or higher.

### Hydrostatic & Nondestructive Electric Testing

Hydrostatic inspection test pressure is 2500 psi for sizes NPS 2 and under. Test pressure shall be maintained for a minimum of 5 seconds.

When specified by the purchaser, pipe may be tested by the nondestructive electric test in lieu of the hydrostatic test.

### End Finish

#### Plain End:

NPS 1-1/2 and smaller shall be either plain end square cut or plain end beveled at the option of the manufacturer. NPS 2 ends shall be beveled to angle 30° +5°, -0° with a root face of 1/16" ± 1/32".

#### Threaded Pipe:

Threads comply with ANSI Standard B 1.20.1

#### Couplings:

Couplings comply with ASTM Standard A 865

### Available Coatings

ASTM A 106 seamless pipe is available in four different coatings:

- Exclusive Blue Diamond® Coating
- Hot-Dipped Galvanized
- Pickled and Oiled
- Bare

### Chemical Requirements Composition, % Max

|                     |           |            |        |
|---------------------|-----------|------------|--------|
| Carbon <sup>A</sup> | Manganese | Phosphorus | Sulfur |
| .25                 | 0.27/0.93 | .035       | .035   |

|          |                     |                     |                       |
|----------|---------------------|---------------------|-----------------------|
| Silicon  | Copper <sup>B</sup> | Nickel <sup>B</sup> | Chromium <sup>B</sup> |
| 0.10 Min | .40                 | .40                 | .15                   |

|                         |                       |
|-------------------------|-----------------------|
| Molybdenum <sup>B</sup> | Vanadium <sup>B</sup> |
| .15                     | .08                   |

<sup>A</sup>For each reduction of 0.01% below the specified carbon maximum, an increase of 0.06% manganese above the specified maximum will be permitted up to a maximum of 1.35%

<sup>B</sup>The combination of these five elements shall not exceed 1.00%

### Tensile Requirements

|                       |             |
|-----------------------|-------------|
| Yield Strength, min   | 35,000 psi  |
| Tensile Strength, min | 60,000 psi  |
| Elongation in 2"      | 35% Minimum |

### Bending Test (Cold) For NPS 2 and under

|               |                |                     |
|---------------|----------------|---------------------|
|               | Degree Of Bend | Diameter of Mandrel |
| Standard      | 90°            | 12 X pipe O.D.      |
| Close Coiling | 180°           | 8 X pipe O.D.       |

### Frequency of Tests

Tensile tests and flattening tests are required on one length of pipe from each lot of 400 lengths or fraction thereof for each size.

### Dimensions and Weights

The dimensions and weights furnished under this specification are in agreement with the standardized dimensions and weights specified in ANSI B 36.10.



F.W. WEBB COMPANY

# ASTM A 106 Seamless Pressure Pipe Grades A & B

Submittal Data

### Plain End Dimensions Schedules 40 & 80

| Nominal Size | O.D. Inches | Schedule 40 |               | Schedule 80 |               |
|--------------|-------------|-------------|---------------|-------------|---------------|
|              |             | Wall        | Weight, Lb/Ft | Wall        | Weight, Lb/Ft |
| 1/8          | 0.405       | .068        | 0.24          | .095        | 0.31          |
| 1/4          | 0.540       | .088        | 0.43          | .119        | 0.54          |
| 3/8          | 0.675       | .091        | 0.57          | .126        | 0.74          |
| 1/2          | 0.840       | .109        | 0.85          | .147        | 1.09          |
| 3/4          | 1.050       | .113        | 1.13          | .154        | 1.48          |
| 1            | 1.315       | .133        | 1.68          | .179        | 2.17          |
| 1-1/4        | 1.660       | .140        | 2.27          | .191        | 3.00          |
| 1-1/2        | 1.900       | .145        | 2.72          | .200        | 3.63          |
| 2            | 2.375       | .154        | 3.66          | .218        | 5.03          |

### Plain End Dimensions Schedules 160 & XXS

| Nominal Size | O.D. Inches | Schedule 160 |               | Schedule XXS |               |
|--------------|-------------|--------------|---------------|--------------|---------------|
|              |             | Wall         | Weight, Lb/Ft | Wall         | Weight, Lb/Ft |
| 1/8          | 0.405       | N/A          | N/A           | N/A          | N/A           |
| 1/4          | 0.540       | N/A          | N/A           | N/A          | N/A           |
| 3/8          | 0.675       | N/A          | N/A           | N/A          | N/A           |
| 1/2          | 0.840       | .188         | 1.31          | .294         | 1.72          |
| 3/4          | 1.050       | .219         | 1.95          | .308         | 2.44          |
| 1            | 1.315       | .250         | 2.85          | .358         | 3.66          |
| 1-1/4        | 1.660       | .250         | 3.77          | .382         | 5.22          |
| 1-1/2        | 1.900       | .281         | 4.86          | .400         | 6.41          |
| 2            | 2.375       | N/A          | N/A           | N/A          | N/A           |

#### Permissible Variations in Wall Thickness

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified. Maximum wall thickness at any point shall not be greater than 20.0% over nominal wall thickness.

#### Workmanship

Visual imperfections such as scabs, seams, laps or tears shall not exceed 5% of the nominal wall thickness.

#### Permissible Variations in Outside Diameter

NPS 1-1/2 and under ± 1/64"  
NPS 2 ± 1/32"

#### Permissible Variations in Weight per Foot

Pipe shall not vary more than 10% over and 3.5% under the standard specified.

#### Product Marking

Each length of pipe is continuously stenciled to show the manufacturer, specification (A106), size (O.D. & wall), "A & B" for Grades A & B, 2500 psi, length and heat number

#### Manufacturing Location

All products furnished manufactured in the USA.

#### Hot-Dipped Galvanized

Pipe is galvanized to the requirements of ASTM A 53. The average weight of zinc coating shall not be less than 1.8 ounces per square foot of surface (inside and outside).

When galvanized pipe is bent or otherwise fabricated to a degree that causes the zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.



## ASTM A 53 TYPE F GRADE A PIPE

### SCOPE

Covers black and hot-dipped galvanized furnace-butt welded (continuous welded) Grade A pipe. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. Pipe is suitable for welding, threading, grooving and bending. Pipe is not intended for flanging. Produced to ASTM A53/A 53M latest revision.

### HOT-DIPPED GALVANIZED

The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside).

When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.

### HYDROSTATIC TESTING

Hydrostatic test pressures for plain-end pipe is indicated below.

| NPS             | Standard Weight - PSI | Extra Strong Weight - PSI |
|-----------------|-----------------------|---------------------------|
| 1/8 through 3/8 | 700                   | 850                       |
| 1/2 through 1   | 1500                  | 1500                      |
| 1-1/4 - 1-1/2   | 2000                  | 2000                      |
| 2 through 3     | 2500                  | 2500                      |
| 3 1/2 - 4       | 2800                  | 2800                      |

### END FINISH

#### Plain End:

NPS 1-1/2 and smaller: unless otherwise specified on order, end finish shall be at the option of the manufacturer.

NPS 2 and larger: STD and Sch 80 weights: ends beveled to angle of 30°, +5°, -0° with a root face of 1/16" ± 1/32".

**Threaded:** To ANSI Standard B 1.20.1

**Couplings:** To ASTM Standard A 865.

### CHEMICAL REQUIREMENTS

Composition, max. %

| Carbon | Manganese | Phosphorus | Sulfur |
|--------|-----------|------------|--------|
| .30    | 1.20      | .05        | .045   |

| *Copper | *Nickel | *Chromium | *Molybdenum | *Vanadium |
|---------|---------|-----------|-------------|-----------|
| .40     | .40     | .40       | .15         | .08       |

\*The combination of these five elements shall not exceed 1.00%.

### TENSILE REQUIREMENTS

|                        |   |
|------------------------|---|
| Tensile Strength, min. | 48 000 psi  |
| Yield Strength, min.   | 30 000 psi.   |
| Elongation in 2"       | Refer to A 53 Table x 4.1, latest revision – ASTM A53/A 53M |

### BENDING TEST (COLD) FOR NPS 2 and UNDER:

|               | Degree of Bend | Diameter of Mandrel        |
|---------------|----------------|----------------------------|
| Standard      | 90°            | 12 x outside pipe diameter |
| Close Coiling | 90°            | 8 x outside pipe diameter  |

### FLATTENING TEST - NPS 2-1/2 and Greater

As a test for quality of the weld, position the weld at 90° from the direction of force and flatten until the OD is 3/4 of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

### DIMENSIONS and WEIGHTS

| BLACK PLAIN END |           |             |                |             |                |
|-----------------|-----------|-------------|----------------|-------------|----------------|
| Nominal Size    | OD Inches | Sch. 40     |                | Sch. 80     |                |
|                 |           | Wall Inches | Weight Lb./Ft. | Wall Inches | Weight Lb./Ft. |
| 1/8"            | .405      | .068        | .24            | .095        | .31            |
| 1/4"            | .540      | .088        | .43            | .119        | .54            |
| 3/8"            | .675      | .091        | .57            | .126        | .74            |
| 1/2"            | .840      | .109        | .85            | .147        | 1.09           |
| 3/4"            | 1.050     | .113        | 1.13           | .154        | 1.48           |
| 1"              | 1.315     | .133        | 1.68           | .179        | 2.17           |
| 1-1/4"          | 1.660     | .140        | 2.27           | .191        | 3.00           |
| 1-1/2"          | 1.900     | .145        | 2.72           | .200        | 3.63           |
| 2"              | 2.375     | .154        | 3.66           | .218        | 5.03           |
| 2-1/2"          | 2.875     | .203        | 5.80           | .276        | 7.67           |
| 3"              | 3.500     | .216        | 7.58           | .300        | 10.26          |
| 3-1/2"          | 4.000     | .226        | 9.12           | .318        | 12.52          |
| 4"              | 4.500     | .237        | 10.80          | .337        | 15.00          |

### PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

### PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

|     |                 |         |
|-----|-----------------|---------|
| NPS | 1-1/2 and under | ± .016" |
| NPS | 2 and over      | ± 1%    |

### PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than ± 10% from the standard specified.

### PRODUCT MARKING

Each length of pipe 1/2 NPS and larger is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A 53), the kind of pipe (F for Continuous Weld, A for Grade A,) the size (Sch 80 for extra strong), and length. Bar Coding is acceptable as a supplementary identification method.



## ASTM A 53 TYPE E GRADE B PIPE

### SCOPE

Covers black and hot-dipped galvanized electric-resistance welded Grade B pipe. Pipe is intended for mechanical and pressure applications and is acceptable for ordinary uses in steam, water, gas and air lines. ASTM A 53 is UL Listed and FM Approved, sizes 1" through 6" nominal, for use in Fire Sprinkler Pipe Applications. Pipe is suitable for welding, threading and grooving. Produced to the latest revision of ASTM A 53/ 53M, Federal Specification WW-P404 and ASME B36.10M.

### MANUFACTURE

The weld seam shall be heat treated after welding to a minimum of 1400 °F or be otherwise processed in such a manner that no untempered martensite remains.

### HOT-DIPPED GALVANIZED

The average weight of zinc coating shall be not less than 1.8 oz. per sq. ft. of surface (inside and outside).

When galvanized pipe is bent or otherwise fabricated to a degree which causes zinc coating to stretch or compress beyond the limit of elasticity, some flaking of the coating may occur.

### HYDROSTATIC AND NONDESTRUCTIVE ELECTRIC TESTING

Hydrostatic inspection test pressures for plain-end pipe are listed in Table X 2.2 of the A53/A 53M specification. Test pressures shall be maintained for a minimum of five seconds.

Nondestructive electric testing of the weld seam is required on each length of ERW pipe NPS 2 and larger.

### CHEMICAL REQUIREMENTS

Composition, max. %

| Carbon | Manganese | Phosphorus | Sulfur |
|--------|-----------|------------|--------|
| .30    | 1.20      | .05        | .045   |

| *Copper | *Nickel | *Chromium | *Molybdenum | *Vanadium |
|---------|---------|-----------|-------------|-----------|
| .40     | .40     | .40       | .15         | .08       |

\*The combination of these five elements shall not exceed 1.00%.

### TENSILE REQUIREMENTS

|                        |                           |
|------------------------|---------------------------|
| Tensile Strength, min. | 60 000 psi                |
| Yield Strength, min.   | 35 000 psi                |
| Elongation in 2"       | Refer to A 53 Table x 4.1 |

### BENDING TEST (COLD)

|                     |   |
|---------------------|---|
| Degree of Bend      | 90°   |
| Diameter of Mandrel | For NPS 2 and under<br>12 x outside pipe diameter |

### FLATTENING TEST

As a test for ductility of the weld for pipe 2-1/2" NPS and larger, position the weld at 0° and alternately at 90° to the direction of force and flatten until the OD is 2/3 of the original outside diameter. No cracks shall occur along the inside or outside surface of the weld.

### FREQUENCY OF TESTS

Tensile tests are required on one length of pipe from each lot of 500 lengths or fraction thereof for each size. Refer to A 53 specification for frequency of flattening tests.

### END FINISH

**Plain End:** NPS 2 and larger, STD and XS weights: ends beveled to angle of 30°, +5°, -0° with a root face of 1/16" ± 1/32"

**Threaded:** To ANSI Standard B 1.20.1  
**Couplings:** To ASTM Standard A 865

### DIMENSIONS AND WEIGHTS

#### PERMISSIBLE VARIATIONS IN WALL THICKNESS

Minimum wall thickness at any point shall not be more than 12.5% under nominal wall thickness specified.

#### PERMISSIBLE VARIATIONS IN OUTSIDE DIAMETER

Pipe NPS 2 and larger shall not vary more than + 1% from the standard specified.

| STANDARD (SCH. 40)<br>BLACK PLAIN END    |             |              |                |
|--|-------------|--------------|----------------|
| Nominal Size                             | O.D. Inches | Nominal Wall | Weight/ Lb. Ft |
| 2"                                       | 2.375       | .154         | 3.66           |
| 2-1/2"                                   | 2.875       | .203         | 5.80           |
| 3"                                       | 3.500       | .216         | 7.58           |
| 4"                                       | 4.500       | .237         | 10.88          |
| 5"                                       | 5.563       | .258         | 14.63          |
| 6"                                       | 6.625       | .280         | 18.99          |
| 8"                                       | 8.625       | .322         | 28.58          |
| EXTRA STRONG (SCH.80)<br>BLACK PLAIN END |             |              |                |
| Nominal Size                             | O.D. Inches | Nominal Wall | Weight/ Lb. Ft |
| 2"                                       | 2.375       | .218         | 5.03           |
| 2-1/2"                                   | 2.875       | .276         | 7.67           |
| 3"                                       | 3.500       | .300         | 10.26          |
| 4"                                       | 4.500       | .337         | 15.00          |

### PERMISSIBLE VARIATIONS IN WEIGHT PER FOOT

Pipe shall not vary more than ± 10% from the standard specified.

### PRODUCT MARKING

Each length of pipe is continuously stenciled to show the manufacturer, the grade of pipe (ASTM A 53), the kind of pipe E for Electric Resistance Welded, B for Grade B, the size, XS for extra strong, and length. Stencil markings indicate UL Listing and FM Approval for sizes 1" through 6" nominal for use in Fire Sprinkler Pipe Applications. Bar coding is acceptable as a supplementary identification method.



**PRODUCT SPECIFICATION BULLETIN**  
**CERTIFICATE of COMPLIANCE - PIPE NIPPLES – MARKING GENERAL**

**SCOPE:** This product specification bulletin applies to carbon steel, stainless steel, red brass, and conduit pipe nipples conforming to the dimensional requirements of ASTM A733. Threads conform to the requirements of ASME B1.20.1. Nipples are manufactured in Schedules 40, 80, 160, and XX heavy wall thickness, conforming to the applicable material specifications listed below:

| <b>NIPPLE TYPE</b> | <b>WELDED/ SEAMLESS</b> | <b>MATERIAL SPECIFICATION</b>                        | <b>MATERIAL GRADE/TYPE</b>    | <b>MARKING REQUIREMENTS</b>  |
|--------------------|-------------------------|--|-------------------------------|--|
| Carbon             | Welded                  | ASTM/ASME A53/SA53                                   | Type F<br>Type ERW            | Not Required   |
| Carbon             | Seamless                | ASTM/ASME A106/SA106<br>ASTM/ASME A53/SA53<br>API 5L | Grade B<br>Grade B<br>Grade B | Logo, Heat Code,<br>A/SA 106 B, Schedule,<br>Size                                      |
| Stainless          | Welded                  | ASTM/ASME A312/SA312                                 | 304/304L<br>316/316L          | Logo, Heat Code, A/SA<br>312, Material Grade (304/L<br>Or 316/L), W, Schedule,<br>Size |
| Stainless          | Seamless                | ASTM/ASME A312/SA312                                 | 304/304L<br>316/316L          | Logo, Heat Code, A/SA<br>312, Material Grade (304/L<br>Or 316/L), S, Schedule,<br>Size |
| Red Brass          | Seamless                | ASTM/ASME B43/SB43                                   | 85/15                         | Not Required   |
| Conduit            | Welded                  | UL-6   | Rigid                         | Underwriters<br>Laboratories<br>Listing Label  |

**NIPPLE MARKINGS**

1/8" through 4" seamless carbon and both welded and seamless stainless nipples with an unthreaded space of 1/2" and longer are marked using low-stress round bottom die stamps. Markings include size, schedule, ASTM/ASME material designation, grade, logo, and heat code. Size markings may be omitted on 1/8", 1/4", and 3/8" pipe size nipples if space is limited due to die stamp character size. Nipples manufactured outside of the United States are marked with the country of origin.

**CARTON MARKINGS**

Carton labels for all nipples, including close nipples, are marked with the size, schedule, A733, grade, logo, heat code, bar code, manufacturing location, and date packed. Carton labels for nipples manufactured in Canada are marked with the country of origin.

These products are produced in accordance with the Capitol Manufacturing, Capproducts Ltd., or Conduit Pipe Products respective ISO 9001:2000 Certified Quality System Program. These products are inspected by independent quality control personnel conforming to the requirements of EN 10204 Section 3.1B. These products were not exposed to mercury or any other metal alloy that is liquid at ambient temperatures during processing or while in our possession.



## MALLEABLE IRON THREADED FITTINGS

### Standard Class 150 Specifications:

[ANSI](#) B1.20.1, Threads, B 16.3, Dimensions, Pressure Rating

[ASTM](#) A197, Material. A153, Galvanizing

[Federal Spec](#): WWP 521

Pressure Ratings: 150 psig – Saturated Stream

300 psig – At 150 Degrees W. O. G.

[U.L.C.](#) and [U.L.](#) listed where applicable, [FM](#) approved

### Extra Heavy Class 300 Specifications:

[ANSI](#) B1.20.1, Threads, B16.3, Dimensions, Pressure Rating

[ASTM](#) A197, Material A153, Galvanizing

Pressure Ratings: 300 psig – Saturated Stream

¼" - 1" – 2000 psig – At 150 Degrees W.O.G.

1 ¼" - 2" – 1500 psig – At 150 Degrees W.O.G.

2 ½" - 3" – 1000 psig – At 150 Degrees W.O.G.

[U.L.C.](#) and [U.L.](#) listed where applicable, [FM](#) approved

### Union Specifications:

**(Brass to Brass, Brass to Iron, Iron to Iron, Gasket Type, Dielectric Iron to Brass)**

[ANSI](#) B1.20.1, Threads, B16.39, Dimensions, Pressure Rating

[ASTM](#) A197, Material. A153, Galvanizing

[Federal Spec](#): WW-U-531

Pressure Ratings: Class 150: 150 psig – Saturated Stream

300 psig – At 150 Degrees W.O.G.

Class 250: 250 psig – Saturated Stream

500 psig – At 150 Degrees W.O.G.

Class 300: 300 psig – Saturated Stream

600 psig – At 150 Degrees W.O.G.

[U.L.C.](#) and [U.L.](#) listed where applicable, [FM](#) approved

### Top Beam & C-Clamp Specifications:

Malleable Iron

[ASTM](#) A197, Material. A153, Galvanizing

3/8", 1/2" rod size

Supplied with set screw and lock nut

Clamp Range: Small mouth Beam Clamp & C-Clamp – ¾"

Large mouth Beam Clamp & C-Clamp – 1 ¼"

[U.L.C.](#) and [U.L.](#) listed where applicable, [FM](#) approved

[ANSI](#) B1.20.1, Threads, B 16.4, Dimensions, Pressure Rating

[ASTM](#) A126, Material. A153, Galvanizing

[Federal Spec](#): WWP 521

Pressure Ratings: 125 psig – Saturated Stream

175 psig – At 150 Degrees W. O. G.

[Federal Spec](#): WW-P-501

[U.L.C.](#) and [U.L.](#) Listed Where Applicable

[FM](#) Approved Where Applicable

### Plug and Bushing Specifications:

[ANSI](#) B1.20.1, Threads, B16.14, Dimensions, Pressure Rating

[ASTM](#) A197 (Malleable), A126 (Cast), Material A153, Galvanizing

Pressure Ratings: Malleable: 150 psig – Saturated Stream

300 psig – At 150 Degrees W.O.G.

Pressure Ratings: Cast: 125 psig – Saturated Stream

175 psig – At 150 Degrees W.O.G.

[Federal Spec](#): WW-P-471

[U.L.C.](#) and [U.L.](#) Listed Where Applicable

[FM](#) Approved Where Applicable

### Drainage Fitting Specifications:

[ANSI](#) B1.20.1, Threads, B16.12, Dimensions

[ASTM](#) A126, Material. A153, Galvanizing

[Federal Spec](#): WW-F-941

### Cast Iron Flange Specifications:

[ANSI](#) B1.20.1, Threads, B16.1, Dimensions, Pressure Rating

[ASTM](#) A126, Material. A153, Galvanizing

Pressure Ratings: 125 psig – Saturated Stream

175 psig – At 150 Degrees W.O.G.

[Federal Spec](#): WW-F-406

[U.L.C.](#) and [U.L.](#) Listed Where Applicable

[FM](#) Approved Where Applicable

### Cast Iron Flange Fitting Specifications:

[ANSI](#) B16.1, Pressure Rating

[ASTM](#) A126, Material

Pressure Ratings: 125 psig – Saturated Stream

175 psig – At 150 Degrees W.O.G.

[Federal Spec](#): WW-F-406

[U.L.C.](#) and [U.L.](#) Listed Where Applicable

[FM](#)



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### PLAIN-END FITTING SPECIFICATIONS

**Housing:** Cast Iron to ASTM A126 Class A

**Set Screws:** Carbon Steel, Cadmium Plated, Self-Locking

**Gaskets:** E.P.D.M. to ASTM D-2000 With Temperature Range of -30 to 230 °F

**Threaded Outlets:** Conform to ANSI B-1.20.1 Specifications

**Pressure Ratings:** 175 psig

U.L. Listed, FM Approved

### MECHANICAL BRANCH CONNECTOR SPECIFICATIONS

**Housing:** Cast Iron to A126 Class A, Ductile to A536

**Gasket:** E.P.D.M. to ASTM D-2000

**Hole Size:** 1 3/16"

**U-Bolt:** Plated High Tensile Steel

**Threaded Outlet:** Conform to ANSI/ASME B-1.20.1 Specifications

**Run Sizes:** 1 1/4", 1 1/2", 2", 2 1/2"

**Outlet Sizes:** 1/2", 3/4", 1"

**Pressure Ratings:** 175 psig

U.L. Listed, FM Approved



F.W. WEBB COMPANY

# System Data Sheet



### System Description

ProPress®, ProPress XL™ and ProPress XLC are safe, reliable, and economical copper pipe installation systems that use modern cold press connection technology for a wide assortment of more than 500 fittings in dimensions ranging from 1/2" to 4".

### Applications

Tubing: K, L, and M hard copper tubing from 1/2" to 4" and soft copper tubing in 1/2" to 1-1/4" diameters. All tubing must comply with the ASTM B88 standard. ProPress fittings are approved for installations in both above and below ground applications. Per code, local inspector approval must be obtained prior to installation below ground.

### Operating Parameters:

Operating Pressure 200 PSI Max.  
Test Pressure 600 PSI Max.  
Low Pressure Steam 15 PSI Max.  
Vacuum 29.2" Mercury Max. @ 68°F  
Operating Temperature 0°F - 250°F

### Approved Applications:

- Potable water
- Hydronic heating (w/ Glycol)
- Chilled water
- Compressed Air (200 PSI Max.)
- Non Medical Gases (140 PSI Max.)
- Fire Sprinkler (175 PSI Max.)
- Low Pressure Steam (15 PSI Max.)
- Vacuum (29.2" Mercury Max. @ 68°F)

### System Benefits

- Fast and Easy to Use
- Flameless
- Permanent Connections
- Wide Capacity from 1/2" to 4"
- Large Selection of Fittings
- Consistent Professional Appearance
- Less Equipment Required
- Environmentally Friendly Connection System
- Versatility of Fittings and Tools for Variety of Applications

### Fittings

Viega ProPress fittings are offered in 500+ configurations including: Elbows, Couplings, Reducers, Tees, Reducing Tees, Threaded Adapters, Unions, Caps, and Flanges. All Threaded 1/2"- 2" fittings are bronze.

### Smart Connect™ (SC Feature)

In ProPress 1/2"- 4" dimensions, the Smart Connect Feature assures leakage of liquids and/or gases from inside the system past the sealing element of an **unpressed** connection. The function of this feature is to provide the installer quick and easy identification of connections which have not been pressed prior to putting the system into operation.

| RIDGID Pressing Tools |           |               |               |
|-----------------------|-----------|---------------|---------------|
| Model                 | CT-400    | 320-E         | 100-B         |
| Volts                 | 120v      | 14.4v Battery | 14.4v Battery |
| Amps                  | 5.2A      | 24A           | 24A           |
| Weight (w/ out jaw)   | 15.6 lbs. | 10.5 lbs      | 7.5 lbs       |

### Tools

RIDGID offers three pressing tools for connecting ProPress fittings.

- CT-400 Corded Tool (1/2" to 4")
- 320-E Battery powered Tool (1/2" to 4")
- 100-B Battery powered Tool (1/2" to 1")
- 1/2" to 4" fittings are pressed in 4-7 sec.

### History

ProPress has been used in Europe since the late 1980s and in the U.S. since the late 1990s for a variety of applications. Backed by two plumbing leaders with over 175 years of combined excellence.

### Warranty

Viega ProPress products carry a 50-year warranty against defects in material and workmanship. The RIDGID Lifetime Warranty applies to tools, jaws and crimp rings from Ridge Tool Company.

### Approvals and Certificates

#### NSF International

[www.nsf.org/business/search\\_listings/index.asp#mname](http://www.nsf.org/business/search_listings/index.asp#mname) (enter "Viega")

#### IAPMO

<http://pld.iapmo.org/> (enter "Viega")

#### UL

<http://database.ul.com/cgi-bin/XYV/template/LISEXT/1FRAME/gfilenbr.html> (enter "ex6157")

#### ABS

(American Bureau of Shipping)  
<http://www.eagle.org/typeapproval/contents.html> (enter "Viega")

#### CSA International

<http://www.csa-international.org/product/> (enter "Viega")

### INTERNATIONAL APPROVALS

- Deutsch Verein des Gas-und Wasserfachese.V. (DVGW)
- Lloyd's Register (LLOYD'S)
- Det Norske Veritas (DNV)
- Registro Italiano Navale (RINA)
- Bureau Veritas (BV)
- KIWA

### Compliant with

- ICC International Plumbing Code
- UPC Uniform Plumbing Code
- PHCC National standard plumbing code
- Florida Building Code, Volume IIPumbing Code
- NFPA 13,13D, and 13R

Contact your local Viega or RIDGID representative for details on local approvals

### For more information on RIDGID

#### products contact:

Ridge Tool Company  
400 Clark Street, Elyria, Ohio 44036  
Demos, Literature: 800-769-7743  
Technical inquiries: 800-519-3456  
Availability: 888-743-4333  
Web: [www.ridgid.com](http://www.ridgid.com)

**VIEGA** • One Company... One Partner... Delivering System Solutions.

301 N. Main, Floor 9 • Wichita, KS 67202 • Ph: 877-Viega-NA • Fax: 800-976-9817 • E-Mail: [service@viega.com](mailto:service@viega.com) • [www.viega-na.com](http://www.viega-na.com)

# Specifications

All of the advantages found in copper as a metal have been capitalized to the utmost in the manufacture of NIBCO Fittings. Because of the accuracy of construction and design, copper plumbing is more efficient and less expensive.

NIBCO manufactures nine general types of fittings: Wrot Pressure; Cast Pressure; Wrot Drainage; Cast Drainage; Flanges; Flared Tube; Threaded Bronze; Insert Fittings for PEX; Barbed Insert Fittings for Polybutylene. Each has its particular place and use and each offers its own advantages when used for the proper service requirement.

**ALLOY AND FINISH** — NIBCO Fittings are made from highest quality raw materials available — Cast Fittings are made from Copper Alloy C84400 which consists of 81% Copper, 7% Lead, 3% Tin, and 9% Zinc per ASTM Specification B584. Wrot Copper Fittings are made from commercially pure copper mill products per ASTM Specifications B75 Alloy C12200.

NIBCO fittings are produced to meet requirements of applicable standards wherever practicable.

NIBCO brand wrot and cast fittings are manufactured in the U.S.A. and Mexico. The manufacturing plants at South Glens Falls, NY, Stuarts Draft, VA, Nacogdoches, TX and Reynosa, Mexico are registered to ISO 9002 quality standards.

Following is suggested phrasing to be incorporated in your specifications or bills of material for Copper Tube Fittings.

**WROT SOLDER JOINT FITTINGS** — “Wrot Solder Joint Fittings shall be produced to one of the following specifications:

1. Material and workmanship shall be in accordance with ASME/ANSI B16.22; Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.”
2. The dimensional, material and workmanship shall meet the requirements of MSS SP-104; Wrought Copper Solder Joint Pressure Fittings.”
3. The dimensional, material and workmanship of 5”–12” copper fittings shall meet the requirements of MSS SP-109 “Welded Fabricated Copper Solder Joint Pressure Fittings.”
4. Certified to ANSI/NSF 61.

dimensions of Federal Specifications WW-F-406 or ASME Std. B16.24.

CLASS 125 — Material, workmanship and dimensions of flanges shall be in accordance with MSS SP-106.

**CAST BRONZE THREADED FITTINGS** — “Cast Bronze Threaded Fittings shall be in accordance with ANSI/ASME B16.15.”

**POLYBUTYLENE COPPER INSERT TYPE VALVES AND FITTINGS** — “Wrot Copper Insert Fittings shall be manufactured per the following specifications: MSS SP-103 or ASTM F1380.”

NIBCO Copper Tube Fittings are all produced to above Standards. To simplify, write your specifications to read: “Copper Tube Fittings to be in accordance with specifications as outlined in NIBCO Catalog c-cf-0602.”

**WROT COPPER MEDICAL MEDICAL GAS SYSTEM COMPONENTS** — Wrot copper fittings that are to be installed in medical gas applications shall be prepared in accordance with NFPA 99, Health Care Facilities Gas and Vacuum Systems and the Compressed Gas Association, Pamphlet G4.1. Packaging shall be adequately protective and include labeling that identifies the preparer and states that the product has been cleaned and bagged for oxygen or med gas service.

For technical information and dimensions refer to the engineering section contained in this catalog.

**CAST COPPER ALLOY SOLDER JOINT FITTINGS** — “Cast Copper Alloy Solder Joint Fittings shall be in accordance with ANSI Std. B16.18.”

**WROT DRAINAGE FITTINGS** — “Wrot Drainage Fittings shall be in accordance with ASME/ANSI Std. B16.29.”

**CAST COPPER ALLOY SOLDER JOINT DRAINAGE FITTINGS** — “Cast Copper Alloy Solder Joint Drainage Fittings shall be in accordance with ASME Std. B16.23.”

**CAST COPPER ALLOY FLARED TUBE FITTINGS** — “Cast Copper Alloy Flared Tube Fittings shall be in accordance with ASME/ANSI Std. B16.26.”

**CAST COPPER ALLOY FLANGES AND FLANGED FITTINGS**—

CLASS 150 — Cast Copper Alloy Flanges and Flanged Fittings shall meet the requirements of MSS SP-106 and/or the workmanship and



Even with all the advances in technology today, the wholly welded piping system has for decades remained the best choice for use in high pressure and high temperature application. Many piping jobs in schools, industrial plants, refineries and factories have benefited from the inherent advantages of a completely welded system. It becomes a closed container joining pipes, valves, fittings, and flanges. A welded joint actually becomes part of the pipe, minimizing leak potential. This provides greater margins of safety, especially under conditions of high internal pressures. Additionally, welding fittings form a continuous metal structure with the pipe, adding forged-in strength to any piping system. Furthermore, smooth forged fittings simplify insulation and take up less space.

## ASTM A 234

### Scope

This standard covers wrought carbon steel fittings of seamless and welded construction which are manufactured to the dimensional specifications of ASME B16.9 and B16.28. These fittings are primarily for use in pressure piping and in pressure vessel fabrication for service at moderate and elevated temperatures.

### Materials

The starting material for fittings shall consist of killed steel, forgings, bars, plates, seamless or fusion-welded tubular products with filler metal added and shall conform to the the chemical requirements of ASTM A 234. Unless otherwise specified, carbon steel plates may be either coarse grain or fine grain practice.

### Manufacture

Forging or shaping operations are performed by hammering, pressing, piercing, extruding, upsetting, rolling, bending, machining, or by a combination of two or more of these operations. The forming process shall be applied so that it will not produce injurious imperfections in the fittings.

### Heat Treatment

Hot-formed WPB fittings, upon which the final forming operation is completed at a temperature above 1150°F and below 1800°F, need not be heat treated.

Cold-Formed WPB fittings, upon which the final forming operation is completed at a temperature below 1150°F, shall be normalized, or shall be stress relieved at 1100°F to 1275°F.

## Fitting Summary Data Sheet

### Chemical requirements (in %):

| Carbon  | Manganese | Phosphorus (max) | Sulfur (max) |
|---------|-----------|------------------|--------------|
| .30 max | .29-1.06  | .050             | .058         |

| Silicon | Chromium | Molybdenum | Nickel  | Copper  |
|---------|----------|------------|---------|---------|
| .10 min | .40 max  | .15 max    | .40 max | .40 max |

| Vanadium | Columbium |
|----------|-----------|
| .08 max  | .02 max   |

### Mechanical requirements:

|                            |                   |
|----------------------------|-------------------|
| Tensile Strength           | 60,000-85,000 psi |
| Yield Strength (min)       | 35,000 psi        |
| Elongation - Longitudinal: | 22%               |
| - Transverse:              | 14%               |

### Dimensions

Butt-welding fittings and butt-welding short radius elbows and returns purchased in accordance with this specification shall conform to the dimensions and tolerances given in the latest revision of ANSI B16.9 and B16.28, respectively.

### Certification

When requested by the purchaser, the manufacturer shall provide a certificate of compliance to this specification.

If requested to provide test reports, the manufacturer shall also provide the following where applicable:

- \* Chemical analysis results. When the amount of an element is less than .02%, the analysis for that element is reported as "<0.02%."
- \* Tensile property results, report the yield strength and ultimate strength in ksi [or MPa] and elongation in percent,
- \* Hardness acceptable in accordance with Section 10 of ASTM A-234,
- \* Seamless or Welded,
- \* Type of Heat Treatment, if any,
- \* Starting material, specifically pipe, plate, etc.,
- \* Statement regarding radiographic or ultrasonic examination.
- \* Any supplemental testing required by the purchase order.

### Product Marking

All fittings shall have the prescribed information stamped or otherwise suitable marked on each fitting in accordance with ASTM A 234/MSS SP-25. A Weldbend fitting is marked as follows: Weldbend's Name, Nominal Pipe Size, Pipe Wall Thickness Designation, Material Grade (WPB/WPC) and Heat Identification Number.

Note: All information contained in this document, and for a complete description of all requirements, refer to ASTM A 105. Sheets are subject to change without notice.



Even with all the advances in technology today, the wholly welded piping system has for decades remained the best choice for use in high pressure and high temperature application. Many piping jobs in schools, industrial plants, refineries, and factories have benefited from the inherent advantages of a completely welded system. It becomes a closed container joining pipes, valves, fittings, and flanges. A welded joint actually becomes part of the pipe, minimizing leak potential. This provides greater margins of safety, especially under conditions of high internal pressures. Additionally, welding fittings form a continuous metal structure with the pipe, adding forged-in strength to any piping system. Furthermore, smooth forged flanges simplify insulation and take up less space.

### ASTM A 105

#### Scope

This standard covers forged carbon steel piping components for ambient- and higher-temperature service in pressure systems. Flanges are ordered either to dimensions specified by the purchaser or to dimensional specifications such as ASME 16.5 and API 6A. Forgings made to ASTM A 105 are normally limited to a maximum weight of 10,000 lb.

#### Materials

Weldbend flanges are made by hammering, pressing, rolling and/or machining cast or forged bars, billets or slabs. These adhere to the extent described in the following sections.

#### Manufacture

ASTM A 105 covers the requirements for forged steel components as finished products only. The requirements for raw materials are covered by the standards specified in Section 2: Referenced Documents of ASTM A 105.

#### Heat Treatment

Heat treatment is not a mandatory requirement of this specification except for the following piping components:

- \* Flanges above Class 300,
- \* Flanges of special design where the design pressure at the design temperature exceeds the pressure-temperature ratings of Class 300, Group 1.1,
- \* Flanges of special design where the design pressure or design temperature is not known.

Heat treatment, when required by the above, shall be annealing, normalizing, normalizing and tempering, or quenching and tempering in accordance with ASTM A 961.

## Flange Summary Data Sheet

### Chemical requirements (in %):

|               |                  |                         |                     |
|---------------|------------------|-------------------------|---------------------|
| <u>Carbon</u> | <u>Manganese</u> | <u>Phosphorus (max)</u> | <u>Sulfur (max)</u> |
| .35 max       | .60-1.05         | .035                    | .040                |

|                |               |               |                 |
|----------------|---------------|---------------|-----------------|
| <u>Silicon</u> | <u>Copper</u> | <u>Nickel</u> | <u>Chromium</u> |
| .10-.35        | .40 max       | .40 max       | .30 max         |

|                   |                 |                  |
|-------------------|-----------------|------------------|
| <u>Molybdenum</u> | <u>Vanadium</u> | <u>Columbium</u> |
| .12 max           | .08 max         | .02 max          |

### Mechanical requirements:

|   |            |
|---|------------|
| Tensile Strength (min)  | 70,000 psi |
| Yield Strength (min)  | 36,000 psi |
| Basic minimum elongation for walls 5/16 in. and over in thickness, strip tests. | 30%        |
| Reduction of area (min)   | 30%        |
| Hardness, HB (max)  | 187        |

### Dimensions

Weldbend flanges are manufactured in accordance with ASME B 16.5 (24" NPS and smaller) and ASME B 16.47 (26" - 60" NPS).

### Certification

For forgings made to specified dimensions agreed upon by the purchaser, and for forgings made to dimensional standards, the application of identification marks, as required by ASTM A 961, shall be the certification that the forgings have been furnished in accordance with the requirements of this standard. The specification designation included on test reports shall include the year of issue and revision letter, if any.

**Test Reports:** When test reports are required, Weldbend will also provide the following, if applicable:

- \*Type of heat treatment,
- \*Tensile property results, i.e., yield strength and ultimate strength in ksi, elongation and reduction in area, in percent,
- \*Chemical analysis results,
- \*Hardness results, and,
- \*Any supplementary testing required by the purchase order.

### Product Marking

All flanges shall have the prescribed information stamped or otherwise suitable marked on each flange in accordance with the Standard/MSS SP-25. A Weldbend flange is marked as follows:

Weldbend's Name, Nominal Pipe Size, A105/SA105, Bore Designation, Heat Identification Number and manufacture date.

Note: All information contained in this document, and for a complete description of all requirements, refer to ASTM A 105. Sheets are subject to change without notice.