



GENERAL SPECIFICATION FOR STANDARD FABRICATED FITTINGS

FAB-7-0702

In view of limited industry standards for fabricated fittings, a conscientious supplier should use due caution in selecting a fabricated fitting supplier. Considerable variations in product quality assurance and performance levels may exist with other manufacturers and similar products. Comparison of performance criteria should be evaluated in accordance with accepted industry and engineering practices.

1.0 Scope

- 1.1 This general specification covers fittings fabricated from PVC or CPVC pipe for both pressure rated and drainage, waste and vent (DWV) applications. Included are *general requirements* for materials, dimensions, structural conformance, pressure ratings, testing and workmanship. Additional requirements may be found in applicable referenced specifications.

2.0 Applicable Specifications & Referenced Documents

2.1 American Society for Testing and Materials (ASTM)

- D 1599 Test Method for Short-Term Hydraulic Failure Pressure of Plastic Pipe, Tubing and Fittings.
- D 1784 Specification for Rigid Poly (Vinyl Chloride) (PVC) Compound and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
- D 1785 Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80 and 120
- D 2241 Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series)
- D 2466 Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
- D 2467 Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
- D 2563 Standard Practice for Classifying Visual Defects in Glass-Reinforced Plastic Laminate Parts
- D 2564 Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Piping Systems
- D 2665 Specification for Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste and Vent Pipe and Fittings
- F 441 Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedule 40 & 80
- F 442 Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe (SDR-PR)
- F 477 Specification for Elastomeric Seals (Gaskets for Joining Plastic Pipe
- F 1498 Specification for Tapered Pipe Threads 60° for Thermoplastic Pipe and Fittings
- F 1866 Specification for Poly (Vinyl Chloride) (PVC) Plastic Schedule 40 Drainage and DWV Fabricated Fittings

2.2 Canadian Standards Association (CAN/CSA) B181.2 PVC Drain, Waste and Vent Pipe and Pipe Fittings

3.0 Basic Materials

- 3.1 Pipe - Fittings shall be fabricated from pipe stock certified by the National Sanitation Foundation (NSF) for use with potable water and in conformance with all applicable ASTM Specifications.
- 3.2 Solvent Cements - solvent cements shall be certified by NSF for use with potable water and in conformance with ASTM Specification D 2564.
- 3.3 Injection Molded Components - molded components used in fitting fabrication shall be certified by NSF for use with potable water and in conformance with applicable ASTM Specifications.
- 3.4 Gaskets - gaskets shall be in conformance with ASTM Specification F 477.

4.0 General Performance Specifications

4.1 All fabricated fittings shall meet or exceed the applicable performance criterial list below

1. Dimensional Conformance
 - a. All sockets shall have an interference fit with applicable pipe.
 - b. All change-of-direction fittings shall not exceed $\pm 1^\circ$ variance in the specified angle.
 - c. All standard stock fittings shall have specified cut lengths for all components in order to maintain dimensional consistence. Maximum overall deviations shall not exceed $\pm 1/2$ " for fittings to 12", ± 1 " for sizes 14" & larger and all wyes.
2. Structural Conformance
 - a. Burst Pressure - representative sample of fittings shall be tested to a minimum of two times the applicable maximum internal pressure rating in accordance with ASTM D 1599.
 - b. Fabricated fittings shall meet the applicable requirements of the following Quality Assurance testing in accordance with the designated Standard Test Method.

| TEST | STANDARD TEST METHOD |
|----------------------------------|--------------------------------|
| Burst Test | ASTM D 1599 |
| Lap Shear Test | CAN/CSA B181.2 |
| Joint Delamination | Spears® Test |
| Air-Gap Spark Test | Spears® Test |
| Fusion Bond Tensile Test | CAN/CSA B181.2 |
| Fusion Bond Deflection | CAN/CSA B181.2 |
| Branch Deflection Test (Bending) | CAN/CSA B181.2/ ASTM F 1866 |
 - c. All DWV and Low Pressure fittings shall additionally meet the requirements of ASTM F 1866 and the applicable portions of CAN/CSA B181.2.



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- d. Fittings designed for use at pressures in excess of 130 psi may be reinforced where reinforcement has been deemed necessary for proper fitting performance.
- e. Fiberglass reinforced fittings shall be free of visible chips, cracks, foreign inclusions, air bubbles, lack of fill-out, delamination and sharp obtrusive surfaces as defined in ASTM D 2563.

6.3 SDR Series Pressure Fittings (IPS & PIP Sizes)

| SDR | COMMON REFERENCE | PSI RATING |
|------|--------------------------|------------|
| 21 | Class 200 IPS | 200 |
| 26 | Class 160 IPS | 160 |
| 32.5 | Class 125 IPS / 125# PIP | 125 |
| 41 | Class 100 IPS / 100# PIP | 100 |
| 51 | 80# PIP | 80 |
| 64 | Class 63 IPS | 63 |

6.4 Ratings for Special Fabricated Fitting Configurations

| TYPE | PSI RATING |
|--|------------|
| Saddles | NPR |
| Duct Fittings | NPR |
| DWV Fittings | NPR |
| Wye, Combo Wye, Double Wye, Sanitary Tee (DWV) | NPR |
| Wye, Sanitary Tee (reinforced) | 100 |
| Schedule 40 & 80 Low Pressure (thru 12") | 130 |
| Schedule 40 & 80 Low Pressure (14" thru 24") | 100 |
| 50 & 100 ft. Head (Low Head) | 43 |
| IPS Flange (Steel Ring) | 150 |
| IPS Flange (Plastic Ring) | 50 |
| PIP Flange 6" - 16" (Plastic Ring) | 125 |
| PIP Flange 14" - 24" (Steel Ring) | 125 |
| Blind Flange 14" - 24" | 50 |
| CPVC 150 Series | 150 |

5.0 Product Labeling

5.1 Fittings or product packaging shall be labeled with the manufacturer's name, part number, size, description, product code and ASTM Specification Number, if applicable.

6.0 Pressure Rating of Spears® Fabricated Fittings

6.1 Spears® fabricated fittings are rated to the following maximum internal pressures for water at 73°F.

6.2 Schedule 40 & Schedule 80 Pressure Fittings

| NOMINAL SIZE | SCHEDULE 40 PSI RATING | SCHEDULE 80 PSI RATING |
|--------------|------------------------|------------------------|
| 2" | 280 | 400 |
| 3" | 260 | 370 |
| 4" | 220 | 320 |
| 5" | 190 | 290 |
| 6" | 180 | 280 |
| 8" | 160 | 250 |
| 10" | 140 | 230 |
| 12" | 130 | 230 |
| 14" | 130 | 220 |
| 16" | 130 | 220 |
| 18" | 130 | 220 |
| 20" | 120 | 220 |
| 24" | 120 | 210 |

Note: NPR = Non Pressure Rated
 Custom fabricated fittings and manifolds are manufactured to user specification and may not meet the above specified requirements.



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