

RECOMMENDED PRACTICE FOR THE FABRICATION OF POLYVINYLIDENE FLUORIDE (PVDF) PIPING

Prepared by
Pipe Fabrication Institute Engineering Committee



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Recommended Practice for the Fabrication of Polyvinylidene Fluoride (PVDF) Piping

1. Scope

- 1.1 The purpose of this recommended practice is to provide methods for purchasing, material receiving, welder qualification, fabrication and installation, inspection and documentation for Polyvinylidene Fluoride (PVDF) piping systems.

2. General

- 2.1 This recommended practice applies to Industrial applications and provides additional requirements where high levels of cleanliness and high purity are necessary. Additional measures for high purity applications are delineated in Section 8. of this practice.
- 2.2 Fabrication of PVDF should be pre-planned to minimize the amount the quantity of field fabrication required.
- 2.3 Precautions should be taken to maintain cleanliness for all pipe and components.
 - 2.3.1 Materials should be handled only with latex gloves. Gloves should be changed if they become soiled or torn.
 - 2.3.2 Hand tools that will come in contact with fabrication materials should be pre-cleaned with Iso Propyl Alcohol.
- 2.4 Completed fabrication should be stored out of direct ultraviolet light.

3. Purchasing, Receiving and Inspection

- 3.1 All materials should be purchased in accordance with known standards and appropriately specified quality standards.
- 3.2 Material should be received in accordance with established Quality Control procedures and methods that provide for proper identification and segregation.
- 3.3 Vendor documentation should be verified for any specified certifications, manuals, etc. accompany the shipment and should be legible and complete.
- 3.4 A representative sample from each lot of incoming material should be randomly segregated for detailed inspection. The randomly selected material should be moved into a clean area where QC personnel can perform the required inspections.
 - 3.4.1 Any material received contaminated should be rejected immediately.
 - 3.4.2 Verify inner and outer legs should be verified for integrity of primary and secondary seals.
 - 3.4.3 End-protection film and end caps should be verified to be in place per specifications.
 - 3.4.4 A detailed dimensional and surface cleanliness inspection of randomly selected material should be performed to ensure customer requirements are met.

4. Welder Qualification

- 4.1 The fabricator or installer of PVDF piping materials should qualify all welding technicians in accordance with the PVDF manufacturer's established welding procedures for each size and thickness of tube and fittings to be used. A representative of the PVDF manufacturer may be appointed to oversee the qualifications. (Special arrangements must be made when systems of mixed PVDF materials are being joined.)
- 4.2 Each welder shall demonstrate his skill in welding techniques by making (two) pipe-to-pipe horizontal (SG) welds for each type of welding process that the welder will be using.

4.2.1 Qualification coupons shall be identified with the craftsman's name or ID number.

4.3 Welder's coupons shall be inspected for insufficient or excessive bead, cleanliness, and general craftsmanship criteria as listed in Section 7.0 of this bulletin.

5. Fabrication and Installation

All welding shall be performed in accordance with both the material manufacturer and equipment manufacturer joining equipment recommendations, unless directed otherwise by the customer.

5.2 All cutting, facing, and welding operations shall be performed in a clean environment, whenever possible.

5.3 Piping, fittings, and components should only be re-cleaned if contaminated at the job site (see 3.4).

5.4 All equipment and tools shall be dedicated for use only on PVDF material, kept clean and in good working order. Tools should be identified for PVDF use only.

5.5 Grease, oil, or other lubricants should not be used when pipe must be cut to size for fabrication.

5.6 Tube ends should be verified for square after cutting and prior to fitup. The manufacturer's normal allowable wall offset at a joint is 10% of wall thickness.

5.7 Before any material is entered into the fusion machine and before any joining is performed, materials should be verified for the proper type and size.

5.8 All joining operations should be performed in accordance with the equipment manufacturers' recommendations and the fabricators established joining procedure.

5.9 Care should be taken to eliminate any airflow at both the ID and OD of the weld joint during the welding process. Airflow could adversely affect the quality of the finished weld.

5.10 Pre-fabricated spool pieces should have adequate end protection prior to shipment and/or installation

5.11 After the piping system is completed and inspected (see Sec 6.0), but prior to pressure test, a system walk down should be performed to ensure the following:

5.11.1 All piping supports, guides, and anchors as per specification are installed.

5.11.2 Pipe is in good condition with no visible cracks, gouges, deformations, or other evidence of abuse.

5.11.3 Pipe flanges are aligned and correct system slope is maintained as specified.

5.11.4 Manufacturer's recommended torque sequence for all flange connections must be marked and followed.

5.11.5 Correct bolts, washers, and gaskets were used as per specification.

6. Visual Inspection

6.1 Weld bead geometry should be consistent and symmetrical for the entire circumference. Small irregularities are acceptable as long as the bead size is not smaller than half the average bead size of the remaining circumference.

6.2 A double weld bead is the most desirable geometry (see Fig 1). A double bead that converges to a single bead is rejectable. A uniform width, height, and form to the I.R. weld bead should be apparent.

6.3 Acceptance criteria shall be as stated in the customer specifications. Welds should meet the requirements of Table 1.