

System shall be operated at a temperature no higher than 140 °F when constructed from PVC.

Part 1. General

1.1.1 Summary

- A. Furnish a complete double-containment piping system including piping, fittings, anchors, terminations, access tees, carrier pipe supports and associated pipe joining method.

1.1.2 References

- A. The following standards apply to products used within this section:
 ASTM D 1784
 ASTM D 1970
 ASTM D 1985
 ASTM D 2466
 ASTM D 2467
 ASTM D 2464
 ASTM D 2564
 NSF 61
 NSF 14
- B. The system design shall meet the requirements of ASME/ANSI B31.3 for design criteria where temperature and pressure fall within the limits of that code.
- C. The system design shall meet the stated minimum requirements of Federal Regulations 40 CFR-280.

1.1.3 Definitions

Product Pipe --- Inside Pipe/Carrier Pipe
Containment Pipe --- Outside Pipe

1.1.4 System Description

- A. System shall be a double-containment piping system of uniform materials.
- B. System shall provide the ability to incorporate leak detection as specified within the Leak Detection Section. Access tees, pull ropes, and low-point instrumentation taps shall be provided as specified by leak detection vendor and/or contract drawings. Supplier of Piping System shall specify Pipe Sizes to accommodate leak detection cable if utilized.

1.2 System Performance Requirements

1.2.1 Submittals

Submit the following:

- A. Product data for each type of double-containment specified including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
- B. Product certificates signed by manufacturer of double-containment product stating compliance with stated requirements.
- C. Qualifications of firms supplying double-containment piping. Firms must have a minimum of 10 years experience in the design, installation and operation of a thermoplastic double-wall piping system.

1.2.2 Quality Assurance

- A. Obtain components from a single source having responsibility and accountability to answer and resolve problems regarding proper installation, compatibility, performance and acceptance.
- B. Design, fabricate and install double-containment piping to meet ASME/ANSI B31.3 where applicable manufacturer shall provide thermal stress analysis demonstrating the ability of the double-containment piping system to handle the stated piping conditions with a restrained or a flexible design, as follows:

1. Restrained Design

The system shall be restrained with no accommodation for inner-pipe movement. Manufacturer or Design Engineer should be consulted for the proper location of anchors.

2. Flexible Design

The system shall be a flexible design with provisions to allow inner and outer pipe ability to move independent of one another. Anchors will be selectively used to direct thermal expansion into expansion loops, and/or offsets, etc. Manufacturer or Design Engineer

should be consulted for the proper location of anchors and expansion compensation design.

1.2.3 Delivery, Storage and Handling

- A. Deliver double-containment piping as a factory assembled unit with protective wrapping/coverings.
- B. Store products on elevated platforms in a dry location with protection from elements.
- C. Lift, support, and transport double-containment piping per manufacturer's recommendations.

1.2.4 Warranty

Warranty period is one year after date of substantial completion of installation.

1.2.5 Extra Materials

Turn over to owner, at end of construction, necessary Assembly, Maintenance and Operating Instructions as suggested by manufacturer.

Part 2. Products

2.1 Manufacturers

Subject to the compliance with requirements and products that may be incorporated into the work include PRO-LOCK PVC Double Containment by Asahi/America, Inc., of Malden, Massachusetts, 1-800-343-3618.

2.2 Materials

- A. Product Pipe: Pipe and fittings shall be Polyvinyl Chloride with a Cell Classification of 12454-B in accordance with ASTM D 1784.
All Pipe and fittings shall be Listed to NSF Standard 61 or health effects portion of NSF Standard 14
- B. Containment Pipe: Same as product pipe.

2.3 Pressure Rating Pipes

Both inner and outer pipes shall conform to requirements for establishing a hydrostatic design basis.

A. Product Pipe

Shall be Schedule 80 PVC Pipe shall be Iron Pipe Size Dimensions manufactured in accordance with ASTM D 1785. Fittings shall be produced in accordance with ASTM D-2467. Product Pipe shall be in sizes ½", ¾", 1", 1-1/2" 2", 3, and 4"

B. Containment Pipe

Shall be Schedule 40 PVC Pipe shall be Iron Pipe Size Dimensions manufactured in accordance with ASTM D 1785. Fittings shall be produced in accordance with ASTM D-2466. Containment pipe shall be at least 2 sizes larger than Product Pipe. Consult Manufacturer for recommendations when using Pull Cable.

2.4 Pressure Rated Fittings

- A. Product Fittings
Shall meet requirements of 2.3.A.
- B. Containment Fittings
Shall meet requirements of 2.3.B.

2.5 Unlisted Components

Any special fittings, not supplied as part of the normal product offering, shall be classified as unlisted components. Products falling into this category shall be supplied by the manufacturer of the Double Containment System Only.

2.6 Valves

Valve arrangements that are to be double contained shall be supplied pre-assembled and tested to 150% of the maximum operating pressures. Actuators, stem extensions, and other accessories shall be part of a pre-assembled package where appropriate.

2.7 Pipe Supports

Supports, guides, etc. for product pipe shall be provided of same resin as product pipe. Supports shall be placed in a manner that a maximum of 0.1" deflection is allowed between supports. Supports shall allow axial movement of product pipe within containment pipe. Supports shall maintain a concentric relationship between product pipe and containment pipe. Supports shall be designed

to allow the pulling of Leak Detection Cable through the pipe.

2.8 Anchors

Anchors shall be provided of same resin as product pipe and containment pipe. Anchors shall be of same wall thickness as product and containment pipe, and must be of unitary construction. Anchors shall be fully pressure rated. Anchors shall be Dogbone style by Asahi/America, Inc. Standard Dogbones shall be used for buried systems, while hung systems must use Restraint Dogbones.

2.9 Fitting Support Disks

Support disks used to centralize fittings shall lock the product (carrier) fitting to the containment fitting. Free-floating fittings are not allowed. Support disks shall be designed to allow for flow and access cable in the annular space.

2.10 Vents/Drains

High-point vents and low-point drains shall provide adequate flows to completely drain annular space. Vents/drains shall be located per contract drawings. Vents/drains shall be of same resin as product pipe.

2.11 Access Tees

Shall be provided per contract drawings and per leak detection manufacturer's requirements. Access tees shall be of same resin as pipe.

2.12 Double Contained Flanges

All double contained flange connection shall consist of a double o-ring flange and a flat - faced flange. The flange design shall provide adequate flow of fluid through the annular space. All flanges shall be of the same resin as the pipe. Consult factory for pressure ratings on Double Contained Flanges

Part 3. Execution

3.1 Installation

- A. Install double-containment piping to comply with manufacturer's recommended procedures.
- B. All Joining shall be done utilizing a 2 Step process of Primer and cement in accordance with ASTM D 2564

- C. Hot gas welding shall not be allowed for wetted components.
- D. Manufacturer/Manufacturer's Representative shall be hired by installing firm for on-site training in the assembly, installation, and operation of double-containment systems.
- E. Install continuous running pull rope for installation of leak detection cable if required. Manufacturer shall supply pipe spools with pull rope in place.

3.2 Testing

Testing shall be conducted in accordance with manufacturer's recommendations. The owner shall be notified at the time of test and choose to be present.

Pressure Systems

- A. Product Pipe
Should be tested hydrostatically to 150% of operating pressure per ASME B31.3 part 345 or per local code.
- B. Containment Pipe
The containment piping shall be tested hydrostatically to 150% of operating pressure per ASME B31.3 or per local codes. The product pipe must be pressurized to the same pressure as the test to prevent collapsing of product pipe.

Alternate to containment pipe hydrostatic test

To avoid moisture in the containment space, an air test can be conducted on the containment pipe. Pressure test is recommended at 5 psi. The inner carrier pipe shall be full of water and under pressure to avoid any possible collapse. When testing with air, the ambient temperature should be above 40 °F and extra safety precautions for personnel shall be put in place during the test.

3.3 Schedules

The following minimum sizes shall be maintained for double-containment assemblies. Annular space must be maintained throughout the pipe, fittings, and all accessories.

Size	Carrier Schedule	Containment Schedule	Leak Cable
1/2" x 2"	80	40	No
3/4" x 3"	80	40	No
1" x 3"	80	40	No
1" x 4"	80	40	Yes
1-1/2" x 4"	80	40	No
2" x 4"	80	40	No
2" x 6"	80	40	Yes
3" x 6"	80	40	Yes
4" x 8"	80	40	Yes