

# Pro-Lock® Double Contained Piping System Specification

PVC 80 x PVC 80

PVC 80 x PVC 40

CPVC 80 x CPVC 80

CPVC 80 x CPVC 40

PVC 40 x PVC 40

CPVC 40 x CPVC 40

## PART 1: GENERAL

### 1.1 Summary

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

### 1.2 References

The following standards apply to products used within this section:

- ASTM D 1784
- ASTM D 1785
- ASTM F 1970
- ASTM D 2467 (PVC SCH. 80)
- ASTM D 2464
- ASTM D 2564
- ASTM D 2466 (PVC SCH. 40)
- ASTM F 441 (CPVC SCH 40 & 80)
- ASTM F 438 (CPVC SCH 40 fittings)
- ASTM F 439 (CPVC SCH 80 fittings)
- ASTM D 2855
- NSF 61
- NSF 14

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.

The system design shall meet the stated minimum requirements of Federal Regulations 40 CFR-280.

### 1.3 Definitions

Product pipe: inside pipe/carrier pipe

Containment pipe: outside pipe

### 1.4 System Description

The system shall be a double containment piping system of uniform materials.

The 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 the leak detection vendor and/or contract drawings. The piping system supplier shall specify pipe sizes to accommodate leak detection cable if utilized.

### 1.5 System Performance Requirements

The system shall be operated at a temperature no higher than 140° F when constructed from PVC. The system shall be operated at a temperature no higher than 200° F when constructed from CPVC.

**1.6 Submittals**

Submit the following:

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

**1.7 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. The 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 independently of one another. Anchors will be selectively used to direct thermal expansion into expansion loops, and/or offsets, etc. The manufacturer or design engineer should be consulted for the proper location of anchors and expansion compensation design.

**1.8 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.

**1.9 Warranty**

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

## PART 2: PRODUCTS

### 2.1 Manufacturers

Subject to compliance with requirements and products that may be incorporated into the work include Pro-Lock® PVC double containment by Asahi/America, Inc., of Lawrence, Massachusetts, 1-800-343-3618.

### 2.2 Material

- A. Product pipe: pipe and fittings shall be polyvinyl chloride with a cell classification of 12454-B in accordance with ASTM D 1784.
- B. Product pipe: pipe and fittings shall be manufactured from CPVC (cell class 23447) as identified in ASTM D 1784.  
All pipe and fittings shall be listed to NSF Standard 61 or health effects portion of NSF Standard 14
- C. Containment pipe: same as product pipe.

### 2.3 Pipe and Pressure-Rated Fittings

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

#### Product Pipe Schedule 80 PVC

Schedule 80 PVC pipe shall be iron pipe size dimensions manufactured per ASTM D 1785.  
Fittings shall be produced in accordance with ASTM D-2467. Product pipe shall be in sizes 1/2", 3/4", 1", 1-1/2", 2", 3", and 4".

#### Product Pipe Schedule 40 PVC

Schedule 40 PVC pipe shall be iron pipe size dimensions manufactured per ASTM D 1785.  
Fittings shall be produced in accordance with ASTM D-2466. Product pipe shall be in sizes 1/2", 3/4", 1", 1-1/2", 2", 3", and 4".

#### Containment Pipe Schedule 80 PVC

Schedule 80 PVC pipe shall be iron pipe size dimensions manufactured per ASTM D 1785.  
Fittings shall be produced in accordance with ASTM D-2467.

#### Containment Pipe Schedule 40 PVC

Schedule 40 PVC pipe shall be iron pipe size dimensions manufactured per ASTM D 1785.  
{clear pipe available}  
Fittings shall be produced in accordance with ASTM D-2466.

#### Product Pipe Schedule 80 CPVC

Schedule 80 CPVC pipe shall be iron pipe size dimensions manufactured per ASTM F 441.  
Fittings shall be produced in accordance with ASTM F-439. Product pipe shall be in sizes 1/2", 3/4", 1", 1-1/2", 2", 3", and 4".

#### Product Pipe Schedule 40 CPVC

Schedule 40 CPVC pipe shall be iron pipe size dimensions manufactured per ASTM F 441.  
Fittings shall be produced in accordance with ASTM F 438. Product pipe shall be in sizes 1/2", 3/4", 1", 1-1/2", 2", 3", and 4".

#### Containment Pipe Schedule 80 CPVC

Schedule 80 PVC pipe shall be iron pipe size dimensions manufactured per ASTM F 441.  
Fittings shall be produced in accordance with ASTM F 439.

#### Containment Pipe Schedule 40 CPVC

Schedule 40 PVC pipe shall be iron pipe size dimensions manufactured per ASTM F 441.  
Fittings shall be produced in accordance with ASTM F 438.

**2.8 Unlisted Components**

Any special fittings not supplied as part of the standard product offering shall be classified as unlisted components. Only the double containment system manufacturer shall supply products falling into this category.

**2.9 Valves**

Valve arrangements that are to be double contained shall be supplied pre-assembled. Actuators, stem extensions, and other accessories shall be part of a pre-assembled package where appropriate.

**2.10 Pipe Support Discs and Guides**

Supports, guides, etc., for product pipe shall be provided of the same resin as product pipe. Supports shall allow axial movement of product pipe within containment pipe. Support disks shall maintain a concentric relationship between product pipe and containment. Support disks shall be designed to allow for an annular space.

**2.11 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™.

**2.12 Vents/Drains**

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

## PART 3: EXECUTION

### 3.1 Installation

- Install double containment piping to comply with manufacturer's recommended procedures.
- All joining shall be done utilizing a 2 Step process of Primer and cement in accordance with ASTM D2855.
- Hot gas welding shall not be allowed for wetted components.
- Manufacturer/Manufacturer's representative shall be hired by installing firm for on-site training in the assembly, installation, and operation of double containment systems.

### 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 Test

##### A. Product Pipe

Hydrostatically test to 150% of operating pressure per ASME B31.3 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

An air test can be conducted on the containment pipe to avoid moisture in the containment space. Pressure test is recommended at 5psi. The inner carrier pipe shall be full of water and under pressure to prevent 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 Leak Detection System

#### A. Low Point Leak Detection

- It is recommended that low point leak detection systems be utilized for Pro-Lock® double containment systems
- Access tees shall be provided per contract drawings and the leak detection manufacturer's requirements. Access tees shall be of same resin as pipe.

#### B. Continuous Leak Detection

- Continuous cable leak detection is difficult. Contact Asahi/America Engineering to discuss cable leak detection options if required.