

**NATURAL RESOURCES CONSERVATION SERVICE
MATERIAL SPECIFICATION**

PIPELINE

(feet)
CODE 516

TABLE 1

PLASTIC PIPE MATERIALS SUITABLE FOR PIPELINE INSTALLATIONS

This applies to pipelines that have an inside diameter of less than 4 inches. Plastic pressure pipe shall be suitable for underground use. The pipe shall conform to the requirements of one of the following ASTM Specifications: The controlling diameter is shown in parenthesis (ID or OD), ID - Inside Diameter and OD - Outside Diameter.

- D1785 Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, 120 (ID)
- D2104 Polyethylene (PE) Plastic Pipe, Schedule 40 (ID > nominal)
- D2241 Polyvinyl Chloride (PVC) Plastic Pipe (SDR-PR) (ID)
- D2239 Polyethylene (PE) Plastic Pipe (SDR-PR) (ID) Based on controlled Inside Diameter (ID > nominal)
- D3035 Polyethylene (PE) Plastic Pipe (SDR_PR) Based on controlled Outside Diameter (OD)
- D2447 Polyethylene (PE) Plastic Pipe Schedule 40 and 80, Based on Outside Diameter (OD)
- D2737 Polyethylene (PE) Plastic Tubing (ID)
- F771 Polyethylene (PE) Thermoplastic High-Pressure Irrigation Pipeline Systems

or AWWA Specifications:

- C901 Polyethylene (PE) Pressure Pipe and Tubing 1/2 through 3 inch for Water Service (Inside Diameter greater than Nominal)

Pressure pipe fittings shall conform to the requirements of the appropriate ASTM Specification:

- D2466 Polyvinyl Chloride (PVC) Plastic Pipe Fitting, Schedule 40
- D2467 Socket-Type Polyvinyl Chloride (PVC) Plastic Pipe fitting, Schedule 80
- D2464 Threaded Polyvinyl Chloride (PVC) Plastic Pipe Fitting, Schedule 80
- D2609 Plastic Insert Fitting for Polyethylene (PE) Plastic Pipe
- D3261 Butt Hat Fusion Polyethylene (PE) Plastic Fitting, for Polyethylene (PE) Plastic Pipe and Tubing
- D2672 Bell-End Polyvinyl Chloride (PVC) Pipe
- D2683 Socket-Type Polyethylene Fitting for Outside Diameter-Controlled Polyethylene Pipe and Tubing
- D3139 Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals

Solvents-welded pipe joints conform to the appropriate ASTM Specifications:

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| Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version, contact the Natural Resources Conservation Service. |
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D2564 Solvent Cements for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings

D2855 Making Solvent-Cements Joints with Polyvinyl Chloride (PVC) Pipe and Fittings

Rubber gaskets for pipe joints shall conform to the requirements of ASTM Specifications F477, Elastomeric Seals (Gaskets) for joining plastic pipe.

Much of the plastic pipe that is normally used for water pipe has a pressure class stamped on the pipe. If not, the pressure class can be computed by the following equation:

$$PC = \frac{2 \times HDS}{DR - 1}$$

where PC = Pressure (pounds per square inch)

HDS = Hydrostatic Design Stress at 73° Fahrenheit

DR or SDR = Dimension Ratio or Standard Dimension Ratio

$$DR = \frac{\text{inside diameter}}{\text{wall thickness}}$$

$$SDR = \frac{\text{outside diameter}}{\text{wall thickness}}$$

The hydrostatic design stress for various plastics are:

| Cell Class for Polyethylene (PE) | Plastic Designation | Hydrostatic Design Stress (pounds per square inch) |
|-------------------------------------|------------------------|---|
| PE 213323C | PE2306 and PE 2406 | 630 |
| PE 324433C | PE3406 | 630 |
| PE 334434C | PE3408 | 800 |
| <hr/> | | |
| for Poly Vinyl chloride (PVC) | | |
| PVC 12454-B | PVC 1120 | 2000 |
| PVC 12454-C | PVC 1220 | 2000 |
| PVC 14333-D | PVC 2120 | 2000 |
| PVC 14333-D | PVC 2116 | 1600 |
| PVC 14333-D | PVC 2112 | 1250 |
| PVC 14333-D | PVC 2110 | 1000 |

Schedule 40 pipe made of PVC 1120 is a common pipe and would meet the 150 pounds per square inch requirements for plastic pipe 4 inches in diameter or smaller. Further information on pipe diameters and wall thickness can be obtained for the pertinent ASTM or AWWA specification listed.

**NATURAL RESOURCES CONSERVATION SERVICE
OPERATION AND MAINTENANCE**

PIPELINE

An operation and maintenance plan shall be developed and established by the producer to maintain the pipeline capacity and associated vegetative cover. Items to consider are:

1. Protect pipeline from damage by farm equipment, vehicles, and livestock.
2. Check for leaks and improper operation. Repair any damage as soon as possible after being noted.
3. Repair any eroded areas that are hazardous to the pipeline. Reestablish vegetative cover immediately where erosion has removed seeding.
4. Mark pipeline locations in areas where they can be damaged by other activities.
5. Record on a map the location of pipeline and its approximate depth.
6. Check to ensure needed volume of water is being supplied at the designed pressure.

Additional Details: _____

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**NATURAL RESOURCES CONSERVATION SERVICE
MISSOURI CONSTRUCTION SPECIFICATION****PIPELINE****General**

Construction operations shall be carried out in a manner and sequence that erosion and air and water pollution are minimized and held within legal limits.

The completed job shall present a workmanlike appearance and shall conform to the line, grades, and elevations shown on the drawings or as staked in the field.

All operations shall be carried out in a safe and skillful manner. Safety and health regulations shall be observed and appropriate safety measures used. Contractor shall be assured that all state laws concerning buried utilities have been met.

All trees, stumps, roots, brush, weeds, and other objectionable materials shall be removed from designated work area.

Materials

Materials and fabrication shall be as specified on the drawings. Plastic pipe 2 inches or less in diameter meeting ASTM specifications D1785, D2239, D2241 or AWWA C901 may be used. Plastic pipe over 2 inches in diameter shall be polyvinyl chloride (PVC) 1120 or 1220 conforming to ASTM D1785 or D-2241. The ASTM or AWWA designation shall be stamped on the pipe. Steel pipe shall meet ASTM specification A53 or AWWA specification C202. Other plastic pipe meeting MO-NRCS Conservation Practice Standard (516) Pipeline is acceptable.

To ensure adequate strength, pipe with a minimum pressure rating of 150 pounds per square inch shall be used when burying the pipe or working with systems that operate at over 50 pounds per square inch.

Placement

Placement of the pipeline shall be as shown on the plans or as staked. The pipe should be free of dirt and other materials before assembling. Flexible plastic pipe shall be placed in a "snake-like" position to provide expansion and contraction with temperature change.

Other parts of the water system shall be installed and connected to the pipeline as specified.

Pipelines shall be placed so that they are protected against hazards imposed by traffic, farm operations, freezing temperatures, or soil cracking. Minimum depth of burial shall be as shown on drawings. Unless otherwise specified, plastic pipe should be buried at least 24 inches for ordinary field traffic. When crossing under a road, pipeline should be buried deeper or otherwise protected from collapsing by placing it in a steel or concrete conduit.

Other means of protection must be provided if the depth required for protection is impractical because of shallow soils over rock or for other reasons. Abrupt changes in grade must be avoided to prevent damage to the pipe.

The pipeline should be buried below frost line or otherwise protected from freezing. If it cannot be protected from freezing, the pipeline should be provided with valves properly located so that the pipe can be drained during periods of freezing weather.

Trenches for plastic pipelines shall be free of rocks and other sharp-edged materials, and pipe shall be carefully placed to prevent damage.

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Flexible plastic pipelines may be placed by plow-in equipment if soils are suitable and rocks and boulders will not damage the pipe material.

All PVC pipe connections designed to be glued will use PVC solvent cement. Allow glue to cure according to manufacturer's guidelines prior to moving pipe and pressure testing. Gluing shall not be done at temperatures below freezing.

Testing

Pipelines shall be pressure tested by one of the following methods:

1. Before backfilling, the pipe shall be filled with water and tested at design working head or a minimum head of 10 feet., whichever is greater. All leaks shall be repaired and the test shall be repeated before backfilling.
2. Pipelines shall be pressure tested at the working pressure for 2 hours. The allowable leakage shall not be greater than 1 gallon per diameter inch per mile. If the test exceeds this rate, the defect shall be repaired until retests show that the leakage is within the allowable limits, except that all visible leaks shall be repaired.

Backfilling

All backfilling shall be completed before the line is placed in service. For plastic or copper pipe, the initial backfill shall be of selected material that is free from rocks or other sharp-edged material that can damage the pipe. Deformation or displacement of the pipe must not occur during backfilling.

Plastic pipelines installed by the plow-in method require surface compaction and shaping in addition to the normal plow-in operations.

Mound soil over pipe to allow for settlement. Provisions shall be provided for stabilizing disturbed areas and controlling erosion, as necessary.

Vegetation

Topsoil shall be added, if needed, to establish vegetation. Refer to JS-AGRON-25 for seeding and mulching recommendations or equivalent.

Additional Details:
