

TECHNICAL BULLETIN

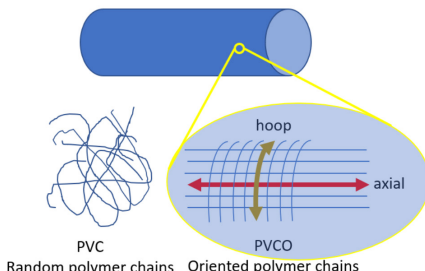
PVCO VS PVC: WHAT TO KNOW

With Westlake Pipe & Fitting's recent release of PVCO pipe into the market, knowing key similarities and differences between PVCO and PVC is essential in making key decisions about which product may be best for your project.

What is PVCO? PVCO stands for molecularly oriented PVC. PVCO pipe actually starts as a piece of PVC pipe stock. During the manufacturing process, the PVC pipe stock is stretched over a mandrel to expand the pipe stock's diameter.

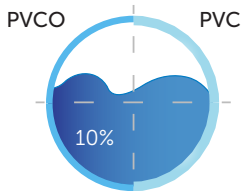
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This process of expanding the pipe stock's diameter orients the PVC molecules in both the hoop orientation and longitudinal orientation. This orientation allows the PVC material to withstand greater stresses from internal pressure than it could before it was expanded.



The final product becomes stronger, tougher, and more flexible than traditional PVC, providing enhanced ease of assembly while maintaining high performance in buried applications.

Why PVCO:



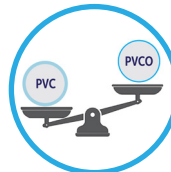
Wall Thickness

Allowing for over 10% more internal flow area for the same pipe outside diameter as PVC.



Impact Resistant

Tougher to endure job site condition.



Less Weight

40% lighter than standard PVC pipe.

PVC's Existing Benefits:



Increased Flow

49% more internal flow area compared to HDPE.



Corrosion Resistant

PVC contains no iron, eliminating the risk of corrosion. Its surface remains consistent over time.



Long Lasting

100 year expected lifetime.



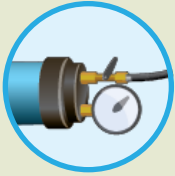
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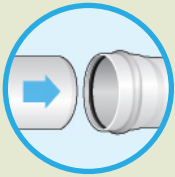
PVCO & PVC: Key Differences

**Nomenclature**

- Unlike PVC, PVCO is not classified by dimension ratio (DR) For example, "AWWA C909 DR 18 PVCO" does not exist.
- PVCO is classified only by its pressure class. For example, "AWWA C909 PC (pressure class) 235 psi".

**Pipe Stiffness**

- The pipe stiffness of PVCO is less than PVC when comparing two pipes of the same size and pressure class. The pipe stiffness of PVCO is still suitable for most buried applications. Refer to table 2 below for more information.

**Making Connections**

- Westlake's PVCO pipe cannot be solvent welded or "glued" like PVC pipe.
- MJ fittings/restraints used on PVCO pipe should be explicitly compatible with PVCO pipe. Designs qualified only for PVC pipe, should not be used with PVCO pipe.

**Maximum Service Temperature**

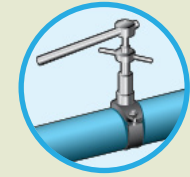
- The maximum allowable operating temperature of PVCO pipe is 130°F (54°C).
- The maximum allowable operating temperature of PVC pipe is 140°F (60°C).
- The pressure class of both PVCO & PVC must be derated at temperatures above 73°F (23°C).

**Wall Thickness**

- A PVCO pipe is approximately 1/2 of the wall thickness as a PVC pipe of the same nominal size and pressure class.

**Bending The Pipe**

- It takes approximately 40% less force to longitudinally bend PVCO pipe compared to PVC.

**Service Tapping**

- Direct tapping of PVCO should not be performed under any circumstances.
- Only PVCO compatible saddle and sleeve taps should be used.

PVCO & PVC: Key Similarities

Bending The Pipe

- The minimum bending radius and offsets for longitudinal bending of PVCO pipe and PVC pipe are the same.

Making Connections

- Both PVCO and PVC pipes are compatible with AWWA C907 injection molded fittings, and PVC Fabricated PVC fittings.
- PVCO and PVC pipe may be assembled together. Correction insertion depths must be accounted for. NOTE: the internal diameters are different

Short Term Pressure Rating

- Both PVCO and PVC have a short pressure rating of 1.6X the pressure class of the pipe.

Thermal Derating Factors

- Operating temperatures elevated above 73°F (23°C) are the same for PVCO and PVC.
- NOTE: The difference in maximum service temperatures above

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PVC0 VS PVC: WHAT TO KNOW

TABLE 1: PVC COMPOUNDS

PVC0		PVC	
Pipe Standard:	AWWA C909-22	Pipe Standard:	AWWA C900-22
Diameter Standard:	CIOD	Diameter Standard:	CIOD
PVC Compound Cell Class:	12454	PVC Compound Cell Class:	12454
Hydrostatic Design Basis (HDB):	7,100 psi (Finished PVC0 Pipe)	Hydrostatic Design Basis (HDB):	4,000 psi
Lay Length:	20'	Lay Length:	20'

TABLE 2: PIPE STIFFNESS

PVC0	PIPE STIFFNESS (PSI)	PVC	PIPE STIFFNESS (PSI)
PC 235	81	DR18	364

TABLE 3: FLOW AREA & WEIGHT

Nominal Size	Outside Diameter (OD) in. [mm]	AWWA C909 PVC0			AWWA C900 PVC				PVC0 Flow Area Advantage over PVC (% more flow area)	PVC0 % Weight Reduction Compared to PVC
		Pressure Class psi [kPa]	PVC0 Flow Area (in. sq.) [M sq.]	Pipe Weight (20 ft./6.1m length) lb. [kg]	DR (PVC Only)	Pressure Class psi [kPa]	PVC Flow Area (in. sq.) [M sq.]	Pipe Weight (20 ft./6.1m length) lb. [kg]		
6" [150mm]	6.900 [175.3]	235 [1,620]	32.7 [0.021]	62 [28]	18	235 [1,620]	29.5 [0.019]	105 [48]	10.8	41.0
8" [200mm]	9.05 [229.9]	235 [1,620]	56.3 [0.036]	107 [49]	18	235 [1,620]	50.8 [0.033]	182 [83]	10.9	41.3
10" [250mm]	11.1 [281.9]	235 [1,620]	84.7 [0.055]	161 [73]	18	235 [1,620]	76.4 [0.049]	275 [125]	10.9	41.3
12" [300mm]	13.2 [335.3]	235 [1,620]	119.8 [0.077]	229 [104]	18	235 [1,620]	108.1 [0.070]	390 [177]	10.8	41.3
14" [350mm]	15.3 [389]	235 [1,620]	161.1 [0.103]	310.8 [141.1]	18	235 [1,620]	145.3 [0.094]	520 [236]	10.9	40.2
16" [400mm]	17.4 [442]	235 [1,620]	208.7 [0.135]	402.8 [182.9]	18	235 [1,620]	188.7 [0.122]	676 [307]	10.6	40.4

Notes:

1. These dimensions are for estimating purposes only.
2. Dimensions in brackets are metric equivalents.
3. DR = Dimension Ratio
4. AWWA Pressure Class @ 73°F [23°C] which includes a 2:1 safety factor.
5. Flow area calculated using nominal outside diameter and minimum wall thickness.