PRODUCT SPECIFICATION

ENERGY EFFICIENT SWEEP ELLS

Solvent Weld

APPLICATION:

Energy efficient injection molded long radius PVC sweep fittings, IPS sizes 1- 4" produced to schedule 40 dimensions, for use at temperatures up to and including 140 °F. Pressure rating varies with pipe size and temperature. Meets applications requiring compliance to California Building Energy Efficiency Standard, Title 24. Typical applications include residential and commercial pool and spa, aquaculture, potable water, automatic refill systems, irrigation, water features, pond systems, and other applications where energy efficient flow performance and corrosion resistance is needed.

SCOPE:

This specification establishes minimum manufacturing requirements for Poly (Vinyl Chloride) (PVC) sweep elbow fittings. These fittings are intended for use in pressure applications where the temperature of the fluid conveyed does not exceed 140 °F. These fittings meet or exceed the industry standards set forth by the American Society for Testing and Materials (ASTM) and NSF International ANSI/NSF Standard 61.

MATERIALS:

The materials used in the manufacturing of the fittings shall be a Rigid Poly (Vinyl Chloride) (PVC) Type 1 PVC compound having a Cell Classification of 12454 per ASTM D1784 (also formerly known as Type I, Grade I PVC; PVC 1120.). Materials used in the manufacture of these fittings shall meet the health and safety requirements of ANSI/NSF Standard 61 as being safe for use with potable water.

DIMENSIONS AND PROPERTIES:

All sizes of PVC injection molded sweep elbows shall be manufactured in strict accordance to the requirements of ASTM D2466 for physical dimensions and tolerances. All PVC injection molded sweep elbows shall consistently meet and/or exceed the quality assurance and other requirements of ASTM D2466 regarding material, workmanship, burst pressure, dimensions and product marking. All PVC injection molded sweep elbows must be certified to meet the requirements of ANSI/NSF Standard 61 for use with potable water and shall bear the mark of the Listing agency. These products shall also be certified to NSF/ANSI 372 conforming to the lead content requirements for "lead free" plumbing as defined by the U.S. Safe Drinking Water act and the state laws of California, Vermont, Maryland, And Louisiana.

Westlake Pipe & Fittings PVC Sch 40 Fittings Conform to the Following Standards and Specifications as applicable:	
ASTM D1784 (Material)	Standard Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds. Cell Classification 12454 Type I PVC (formerly known as Type I, Grade I PVC) PVC 1120
ASTM D2466	Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
NSF Standard 61	Drinking Water System Components – Health Effects (Third Party Certification materials are suitable for potable water applications)
CA Title 24	CA Building Energy Efficiency Standards Sec 150.0 Mandatory Features and Devices
USA	Pipe fittings manufactured by Westlake Pipe & Fittings are manufactured in the United States of America

MARKING:

All sizes of PVC sweep elbow fittings shall be marked "Energy Efficient" and meet the marking requirements of ASTM D2466 that includes as a minimum the manufacturers name and /or trademark, the material designation PVC 1, the NSF mark of approval for use with potable water, and the designation D2466.

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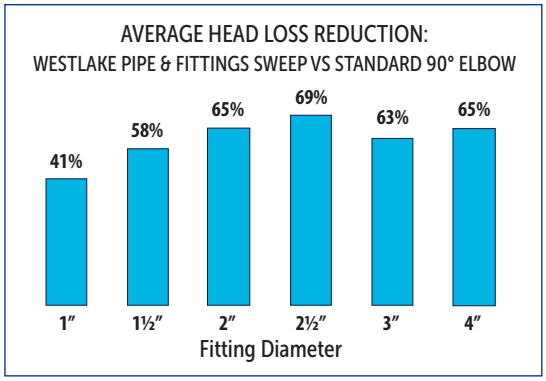
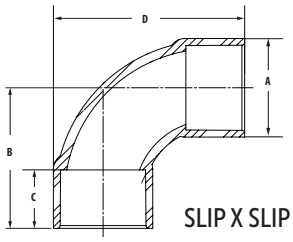
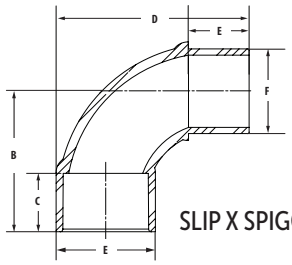
ENERGY EFFICIENCY:

Westlake Pipe & Fittings Sweep Elbows offer 1-1/2 to 3 times less pressure loss than conventional 90° elbows depending on pipe size and flow rate. Westlake Pipe & Fittings' sweep elbows exceed the performance requirements of CA Title 24 Energy Efficiency Code requirements. The friction loss in equivalent feet of pipe for all sweep elbow sizes is shown in the tables below. Efficiencies shown are based on a flow velocity of 8 ft/s.





SLIP X SLIP



SLIP X SPIGOT

SLIP X SLIP

Part No.	A	B	C	D
406-010SW	1.60	2.67	1.00	3.50
406-015SW	2.12	3.15	1.30	4.25
406-020SW	2.70	3.66	1.20	5.00
406-025SW	3.30	4.82	1.80	6.50
406-030SW	3.96	5.00	1.93	6.90
406-040SW	5.00	7.56	2.33	10.00

AVERAGE LOSS IN EQUIVALENT FEET OF PIPE

Pipe Diameter (in)	Conventional Elbow (ft)	WPF Sweep (ft)
1	1.48	0.88
1-1/2	1.95	0.81
2	2.22	0.78
2-1/2	1.98	0.59
3	2.31	0.84
4	1.97	0.66

SLIP X SPIGOT

Part No.	A	B	C	D	E	F
409-010SW	1.60	2.67	1.00	3.50	1.00	1.35
409-015SW	2.12	3.15	1.30	4.25	1.40	1.90
409-020SW	2.70	3.66	1.20	5.00	1.25	2.375
409-025SW	3.30	4.82	1.80	6.50	1.85	2.875
409-030SW	3.96	5.00	1.93	6.90	1.95	3.50
409-040SW	5.00	7.56	2.33	10.00	2.40	4.50

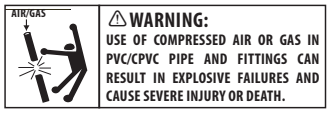
NOTES:

The maximum allowable operating temperature for PVC is 140°F

PVC Schedule 40 Pipe and Fitting Material Equivalents: ASTM D 1784 Cell Classification = PVC Type 1 (Formerly Type 1, Grade 1 PVC) = PVC 1120 = Rigid (Unplasticized) PVC Maximum Hydrostatic Design Stress (HDS) @ 73°F = 2,000 psi; Maximum Hydrostatic Design Basis (HDB) @ 73°F = 4,000 (Per ASTMD2837/PPI TR-3/PPI TR-4). Solvent Welded joints should be utilized for joining systems operating at or near maximum allowable temperatures for PVC. Westlake Pipe & Fittings does not recommend the use of conventional PVC threaded connections at temperatures above 110°F. Use flanged connections, unions, grooved couplings or suitable mechanical connections where disassembly is necessary at elevated temperatures. Flange components must be installed in accordance with Westlake Pipe & Fittings published Flange Installation Guidelines.

Plastic piping systems must be engineered, installed, operated, and maintained in accordance with accepted standards and procedures. Suitability for the intended application should be determined and verified by the designer and/or installer prior to use. Chemical resistance data must be referenced for proper material selection prior to use.

Although fittings meet the same burst pressure as pipe, working pressure ratings for schedule 40 fittings are not established per ASTM D2466. A respected rule of thumb based on practical experience suggests that the working pressure ratings for PVC Sch 40 and Sch 80 molded fittings is 60% of the maximum working pressure rating of the same size and schedule PVC pipe (reference 1987 publication "Operating and Maintaining Piping Systems Using PVC Fittings" by Ron D. Bliesner). Westlake Pipe & Fittings supports this widely accepted rule of thumb. The exception is special engineered fittings such as flanges, unions, valves, and other specialty components that do have working pressure ratings established by the manufacturer (they are typically lower than that of the same pipe size). As is the case with pipe, the maximum allowable working pressure for fittings must be decreased with an increase in temperature using the same material temperature de-rating factors. Factors such as fitting geometry, fitting design, system operating conditions (i.e. actual surge conditions), fluids conveyed, severity of service, temperature and other variables must be considered by the design authority when determining suitability for the intended application. Substantial reductions in working pressure are advisable when handling aggressive chemicals and in high temperature service applications.



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