

PVC SOLVENT WELD

PLUMBING/IRRIGATION



**High
Standard
Pipe**



High Standard Pipe®



SOLVENT VELD

PVC Solvent Weld Pipe

Meets ASTM D1785, D2241, D2665, D2729, D2949, D3034 & F891

PVC Schedule 40, 80 and Cellular Core Schedule 40

Pressure Rated 100, 125, 160, 200, 250 and 315 psi

Sewer and Drain Pipe, Perforated Pipe

Meets ASTM D2661 and ASTM F628



High Standard Pipe®

SOLVENT WELD

PLUMBING AND IRRIGATION

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PRODUCT DESCRIPTION

SOLVENT WELD

FOR USE IN PLUMBING, DRAINAGE WASTE AND IRRIGATION

DESCRIPTION

HSP covers the following Solvent Weld pressure and non-pressure products in this catalog: PVC Schedule 40 and 80 (ASTM D1785 and/or ASTM D2665), Cellular Core PVC Sch 40 (ASTM F891), PVC Schedule 30 (ASTM D2949), PVC Pressure Rated (ASTM D2241), PVC Sewer Pipe (ASTM D3034), PVC Perforated Drain Pipe (ASTM D2729), ABS Sch 40 (ASTM D2661), and Cellular Core ABS Sch 40 (ASTM F628).

LONG LAYING LENGTHS

All JM Eagle™ Solvent Weld pipe products are offered in 20 and/or 10 feet standard lengths. This means that more ground can be covered during installation while eliminating the cost of unnecessary joints.



APPLICATIONS

Solvent Weld joints are designed to provide a rigid (or restrained) joint connection. These products are engineered for use in a variety of applications from potable water distribution to sewer and drainage systems. Additionally, the schedule rated products are specifically engineered for use in partial support systems above ground.



PURPLE RECLAIM

HSP also manufactures this pipe in purple, specifically for reclaimed water systems. This pipe is made and tested to the same requirements as our standard products. The only difference is that the pigment used is purple. These products will not be marked with the UL or NSF listing marks. Additionally, the purple pipe will be marked: "Reclaimed Water... Do Not Drink."

QUALITY CONTROL

This pipe is tested in accordance with the provisions of the appropriate listed standard(s) and subject to inspection by our quality control inspectors throughout every step of the manufacturing process.

HSP Quality Management System is ISO 9001: 2008 registered. Copies of the registration certificates are available on our website at <http://www.highstandardpipes.com>.

CORROSION RESISTANCE

Solvent Weld PVC is unaffected by electrolytic or galvanic corrosion, or any known corrosive soil or water condition. You don't have to worry about tuberculation, or the need for costly lining, wrapping, coating, or cathodic protection.



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FLOW CAPACITY

This PVC water pipe has a smooth interior that stays smooth over its long service life with no loss in carrying capacity. It's coefficient of flow is C=150 (hazen & Williams) the best available in common use water systems. This capacity often allows savings in pumping costs as well as savings on the size of pipe required.

SAVE IN HANDLING COSTS

HSP Solvent Weld pipe products are designed for installed-cost savings. Most sizes can be handled manually, so there is no need for costly installation equipment. Use the backhoe for excavating and backfilling only. Dig more trench, lay pipe faster, and save more in costs per foot installed.

LIGHT WEIGHT

A 20 foot length of 6" Schedule 40 PVC water pipe weighs approximately 72 pounds. That makes it easy to load, easy to transport, and easy to handle. Installers prefer it because it goes into the ground quickly, thus saving on installation costs.



SERVICE LIFE

Since PVC does not corrode and is resistant to most chemicals, the pipe does not lose strength due to either potable water corrosion or external galvanic soil conditions. The design of the pressure rated pipe products allows for a 2 to 1 long-term safety factor at the marked capacity of the pipe.

FIELD CUTTING

You can cut Solvent Weld PVC pipe with a power saw or an ordinary handsaw. This eliminates the need to invest in costly cutting equipment. The pipe can also be beveled without the use of any expensive or complicated machinery.



I.P.S. AND GRAVITY SEWER O.D.'S

Available in .5" through 16" diameter sizes, this pipe can be connected directly to most plumbing and I.P.S. fixtures without complicated procedures or adapters. In addition, it can be connected into C.I.O.D. fittings with adapters and/or transition gaskets.





High Standard Pipe®



PRODUCT DESCRIPTION (CONTINUED)



SOLVENT WELD JOINTS

Solvent Weld joints provide a rigid joint connection for use in applications where restraint of the joint may be needed. This allows the whole run of pipe to act as one piece of pipe, regardless of the number of joints. This is accomplished by fusing material from both the spigot end and the bell end (or coupling) together.

Once this is properly done and the joint has cured, the result is a “zero-leak” joint that is structurally sound.

Solvent Weld joints are most often used in applications above ground and/or indoors. They may be used, however, in underground applications. During installation, it is important to remember that the finished product will function as a single span of pipe. Therefore, allowances in the form of “snaking,” or offsets, should be made to accommodate thermal expansion of the material and/or surges.

ACCESSORIES

HSP Solvent Weld PVC pipe is compatible with all the items required for smooth installation of plumbing, vent, and drainage pipe systems.





High Standard Pipe®

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SURGE DESIGN

SURGE PRESSURES IN VARIOUS PRESSURE PIPE

It is important to note that for the same conditions of interrupted flow, the surge pressures generated in pipe with high tensile module will be greater than the surges in low module (PVC) pipe of similar dimensions.

As the modulus of tensile elasticity for a piping material increases, the resultant pressure surges, or “water hammer”, caused by a change in flow velocity increases. For example, an instantaneous 2 fps (0.6 mps) flow velocity change in an 6" water pipe will create surge pressures, as shown in **Table 1**, for different pipe materials. For all system designs, surge pressures should be examined with the pipe material in use.

Table 1

PRESSURE SURGES IN 6 IN. WATER MAIN

In Response to 2 fps (0.6 mps) Instantaneous Flow Velocity Change.

PIPE Product	PRESSURE SURGE	
	psi	kPa
Class 350 DI Pipe	109.0	751
Sch. 40 PVC Pipe	29.2	202

Pressure surges in PVC pipe of different dimension schedules in response to a 1 fps (0.3 mps) instantaneous flow velocity change are shown in **Table 2**.

Table 2

DESIGN TABLE FOR PVC PIPE-PRESSURE SURGE VS. SIZE

In Response to 1 fps (0.3 mps) Instantaneous Flow Velocity Change.

SIZE (IN)	PRESSURE SURGE (psi)	
	Sch. 40	Sch. 80
0.5	27.9	32.9
0.75	25.3	29.9
1	24.4	28.7
1.5	21.1	25.0
2	19.3	23.2
3	18.9	22.4
4	17.4	20.9
6	15.5	19.4
8	14.6	18.3
10	13.9	17.3
12	13.4	17.6

* For surge generated in Pressure Rated (SDR Series) products.





SHORT FORM SPECIFICATION

SOLVENT WELD

SCOPE

This specification designates general requirements for 0.5" through 16" unplasticized polyvinyl chloride (PVC) and 1.5" through 6" ABS Solvent Weld pipe for the conveyance of water and other fluids in pressure and non-pressure applications. Please contact HSP Sales for availability.

MATERIALS

All solid wall PVC pipe shall be made from quality PVC resin, compounded to provide physical and mechanical properties that equal or exceed cell class 12454 or 12364 or 12164 as defined in ASTM D1784. PVC cellular core pipe material shall meet cell classification 11432 per ASTM D4396. All pipe constructed of ABS materials shall be made from quality ABS resin, compounded to provide physical and mechanical properties that equal or exceed cell class 42222 as defined in ASTM D3965.

STANDARD LAYING LENGTHS

Standard lengths are 10 or 20 feet for all sizes depending on the product and shipping location.

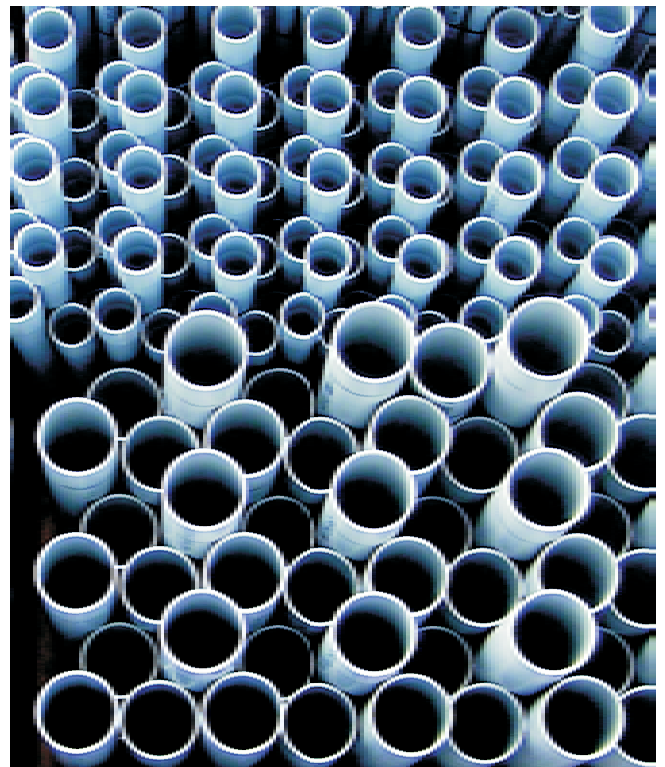
PIPE

All pipe shall be suitable for use as pressure conduit and/or DWV conduit. Provisions must be made for expansion and contraction of the pipe structure. The bell section shall be designed to be at least as hydrostatically strong as the pipe wall and meet the requirements of the appropriate specification for the pipe. Sizes and dimensions shall be as shown in this specification.

For product installation notes and procedures, please contact HSP info@highstandardpipes.com, sales@highstandardpipes.com

OTHER PROPERTIES

Pipe stiffness and impact resistance of these products are measured in accordance with the applicable standards. For specific values, please contact HSP Sales or consult the latest edition of the ASTM product standard.





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QUICK BURST TEST

Randomly selected samples of pressure rated pipe is tested in accordance with ASTM D1599 and shall withstand the prescribed pressures without failure, when applied in 60-70 seconds.

TESTING REQUIREMENTS FOR ASTM D1785

PIPE SIZE (IN)	Schedule 40		Schedule 80	
	Long Term Pressure Test 1000 hours (psi)	Short Term Burst Test psi	Long Term Pressure Test 1000 hours (psi)	Short Term Burst Test psi
½	1250	1910	1780	2720
¾	1010	1540	1440	2200
1	950	1440	1320	2020
1¼	770	1180	1090	1660
1½	690	1060	990	1510
2	580	890	850	1290
2½	640	970	890	1360
3	590	840	790	1200
4	470	710	680	1040
5	410	620	610	930
6	370	560	590	890
8	330	500	520	790
10	300	450	490	750
12	280	420	480	730

TESTING REQUIREMENTS FOR ASTM D2241

	SDR 41 100 psi	SDR 32.5 125 psi	SDR 26 160 psi	SDR 21 200 psi	SDR 17 250 psi
Long Term Pressure Test 1000 hours (psi)	210	270	340	420	530
Long Term Pressure Test (psi)	315	400	500	630	800





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SHORT FORM SPECIFICATION

SOLVENT WELD

(CONTINUED)

ADDITIONAL TEST REQUIREMENTS FOR SOLVENT WELD PRESSURE RATED PIPE

ASTM D2241 ASTM D1785

ACETONE IMMERSION TEST PER ASTM D2152						
Sch 40	Sch 80	SDR 41	SDR 32.5	SDR 26	SDR 21	SDR 17
20 min.	20 min.	20 min.	20 min.	20 min.	20 min.	20 min.
FLATTENING TEST - TESTS EXTRUSION QUALITY AND DUCTILITY UNDER SLOW LOADING CONDITIONS						
Sch 40	Sch 80	SDR 41	SDR 32.5	SDR 26	SDR 21	SDR 17
40% between the plates within 2 - 5 min	40% between the plates within 2 - 5 min	40% between the plates within 2 - 5 min	40% between the plates within 2 - 5 min	40% between the plates within 2 - 5 min	40% between the plates within 2 - 5 min	40% between the plates within 2 - 5 min

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

PROPERTY	SOLVENT WELD PVC PIPE	ASTM TEST METHOD
Fiber hoop Stress at 73° F Short Term Bursting Strength (psi) 1,000 Hour Strength (psi)	6400 * 4200 *	D1599 D1598
working Pressurizing 73° F (% of rating at 73° F) 80° F (% of rating at 73° F) 100° F (% of rating at 73° F)	100% * 88% * 60% *	—
chemical resistance at 73° F Acids Salts - Bases Aliphatic Hydrocarbons (including crude oil)	excellent excellent good	—
Thermal Expansion (in / 100 ft / 50° F Change)	2"	—
Fire resistance	Self extinguishing	—
Flame Spread	10	e162
Smoke development	330	e84
coefficient of Flow Hazen & Williams	C = 150	—
manning's Nvalue	n = 0.009	—

* Pressure Rated products only

* Please contact sales for availability and product range.



High Standard Pipe®

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DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

PVC SOLVENT WELD - (SCHEDULE SERIES)

Dual marking for both Pressure and Drain, Waste, Vent (DWV) Applications

HSP PVC SCHEDULE 40/DWV PIPE

Specifications: ASTM D1785 & ASTM D2665 ::

Listed : ANSI/NSF-PW NSF-DWV
Standard 61, Standard 14

Nom. PIPE SIZE (IN)	O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	WATER PRESSURE RATING AT 23 °C (73 °F)	APPROX. WEIGHT (LBS/FT)
½	0.840	0.609	0.109	600	0.164
¾	1.050	0.810	0.113	480	0.218
1	1.315	1.033	0.133	450	0.324
1¼	1.660	1.363	0.140	370	0.439
1½	1.900	1.593	0.145	330	0.525
2	2.375	2.049	0.154	280	0.705
2½	2.875	2.445	0.203	300	1.118
3	3.500	3.042	0.216	260	1.463
4	4.500	3.998	0.237	220	2.083
6	6.625	6.031	0.280	180	3.663
8	8.625	7.942	0.322	160	5.512
10	10.750	9.976	0.365	140	7.815
12	12.750	11.889	0.406	130	10.333
14	14.000	13.073	0.437	130	12.220
16	16.000	14.940	0.500	130	15.980

:: Standard Color: White, Standard Length 10' & 20', Plain End and Belled End.

HSP PVC SCHEDULE 30/DWV FOR DRAIN, WASTE, VENT PIPE

Specifications: ASTM D2949 ::

Listed : ANSI/NSF-DWV, Standard 14

Nom. PIPE SIZE (IN)	o.d. (IN)	Nom. I.d. (IN)	min. T. (IN)	WATER PRESSURE RATING AT 23 °C (73 °F)	APPROX. WEIGHT (LBS/FT)
3	3.250	2.980	0.125	none	0.800

:: Cell Class 12454

* Prior to ordering or specifying, please consult HSP for product and/or listing availability.

I.D. : Inside Diameter

O.D. : Outside Diameter

T. : Wall Thickness





High Standard Pipe®

DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

HSP PVC SCHEDULE 80 PIPE

Specifications: ASTM D1785 ::

Listed : ANSI/NSF-PW Standard 61, Standard 14

Nom. PIPE SIZE (IN)	O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	WATER PRESSUR E RATING AT 23 °c (73 °F)	APPROX. WEIGHT (LBS/FT)
½	0.840	0.528	0.147	850	0.210
¾	1.050	0.724	0.154	690	0.285
1	1.315	0.936	0.179	630	0.419
1¼	1.660	1.255	0.191	520	0.579
1½	1.900	1.476	0.200	470	0.701
2	2.375	1.913	0.218	400	0.969
2½	2.875	2.290	0.276	420	1.479
3	3.500	2.864	0.300	370	1.979
4	4.500	3.786	0.337	320	2.892
6	6.625	5.709	0.432	280	5.516
8	8.625	7.565	0.500	250	8.336
10	10.750	9.493	0.593	230	12.375
12	12.750	11.294	0.687	230	17.027

: : Standard Color: Dark Gray, Standard Length: 20' overall, Plain End Only

I.D. : Inside Diameter

O.D. : Outside Diameter

T. : Wall Thickness





High Standard Pipe®



DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

CELLULAR CORE PIPE

HSP PVC SCHEDULE 40/DWV CELLULAR CORE PIPE

Specifications: ASTM F891 ::

Listed : ANSI/NSF-DWV Standard 14

Nom. PIPE SIZE (IN)	O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	APPROX. WEIGHT (LBS/FT)
1½	1.900	1.593	0.145	0.383
2	2.375	2.049	0.154	0.500
3	3.500	3.042	0.216	1.050
4	4.500	3.998	0.237	1.450
6	6.625	6.031	0.280	2.450
8	8.625	7.942	0.322	—
10	10.750	9.976	0.365	—
12	12.750	11.889	0.406	—

:: Standard Color: White, Standard Length: 10' & 20', Plain End and Belled End

* Prior to ordering or specifying, please consult HSP for product and/or listing availability.

I.D. : Inside Diameter

O.D. : Outside Diameter

T. : Wall Thickness

HSP ABS SCHEDULE 40/DWV AND/OR WITH CELLULAR CORE PIPE

Specifications: ASTM D2661 and ASTM F628 ::

Listed : ANSI/NSF - DWV, Standard 14

Nom. PIPE SIZE (IN)	o.d. (IN)	Nom. I.d. (IN)	MIN T. (IN)	APPROX. WEIGHT SCH 40/DWV	APPROX. WEIGHT SCH 40/DWV CELLULAR CORE
1½	1.900	1.593	0.145	0.383	0.277
2	2.375	2.049	0.154	0.515	0.363
3	3.500	3.042	0.216	1.069	0.728
4	4.500	3.998	0.237	1.523	1.022
6	6.625	6.031	0.280	1.768	1.768

:: Available in 5', 10' and 20' lengths.

* Prior to ordering or specifying, please consult HSP for product and/or listings availability.

I.D. : Inside Diameter

O.D. : Outside Diameter

T. : Wall Thickness





High Standard Pipe®

DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

PVC SOLVENT WELD - (SDR SERIES) : :

HSP PVC SOLVENT WELD PRESSURE RATED PIPE

Specifications: ASTM D2241

Listed : ANSI/NSF - Standard 61, Standard 14

Nom. PIPE SIZE (IN)	o.d. (IN)	100 psi/ SDR 41 MIN. T. (IN)	125 psi/ SDR 32.5 MIN. T. (IN)	160 psi/ SDR 26 MIN. T. (IN)	200 psi/ SDR 21 MIN. T. (IN)	250 psi/ SDR 17 MIN. T. (IN)	315 psi/ SDR 13.5 MIN. T. (IN)
½	0.840	—	—	—	—	—	0.062
¾	1.050	—	—	—	0.060	0.062	0.078
1	1.315	—	—	0.060	0.063	0.077	0.097
1¼	1.660	—	0.060	0.064	0.079	0.098	0.123
1½	1.900	—	0.060	0.073	0.090	0.112	0.141
2	2.375	—	0.073	0.091	0.113	0.140	0.176
2½	2.875	—	0.088	0.110	0.137	0.169	0.213
3	3.500	0.085	0.108	0.135	0.167	0.206	0.259
3½	4.000	0.098	0.123	0.154	0.190	0.235	0.296
4	4.500	0.110	0.138	0.173	0.214	0.265	0.333
5	5.563	0.136	0.171	0.214	0.265	0.327	0.412
6	6.625	0.162	0.204	0.255	0.316	0.390	0.491
8	8.625	0.210	0.265	0.332	0.410	0.508	—
10	10.750	0.262	0.331	0.413	0.511	0.632	—
12	12.750	0.311	0.392	0.490	0.606	0.750	—

:: Standard Color: White, Standard Length: 20' Overall, Belled End Only.

* Prior to ordering or specifying, please consult HSP for product and/or listing availability.



High Standard Pipe®



DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

PERFORATED UNDER DRAIN PIPE : :

HSP PVC ASTM D3034 SOLVENT WELD SDR35 SEWER PIPE

HSP SOLVENT WELD SEWER PIPE CONFORMS TO SPECIFICATIONS PRIOR TO PERFORATION AND CELL CLASS 12454 OR 12364AS DEFINED IN ASTM D1784

Nom. PIPE SIZE (IN)	o.d. (IN)	Nom. I.d. (IN)	min T. (IN)	APPROX. WEIGHT (LBS/FT)
4"	4.215	3.961	0.120	1.022
4" x 10' Perf	4.215	3.961	0.120	1.022
6"	6.275	5.893	0.180	2.285
6" x 10' Perf	6.275	5.893	0.180	2.285

:: Standard Color: Gray, Standard length: 10' or 20' Overall, Belled End Only.

:: Standard perforations for pipe are two rows of holes ½" in diameter on 5" centers and 120° angle apart.

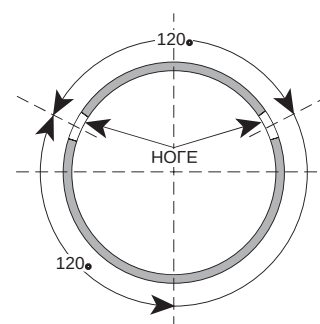
Perforated pipe does not have ASTM designation on print line.

WHEN USING HSP PVC ASTM D3034 SOLVENT WELD SEWER PIPE FOR SEPTIC TANK FIELDS, PLEASE INSTALL IN ACCORDANCE WITH ASTM D2321

HSP PVC ASTM D2729 SOLVENT WELD DRAIN PIPE

HSP SOLVENT WELD DRAIN PIPE CONFORMS TO SPECIFICATIONS AND CELL CLASS 12454 OR 12164 AS DEFINED IN ASTM D1784

Nom. PIPE SIZE (IN)	o.d. (IN)	Nom. I.d. (IN)	MIN T. (IN)	APPROX. WEIGHT (LBS/FT)
3" SOLID	3.250	3.102	0.070	0.465
3" Perf	3.250	3.102	0.070	0.465
4" Solid	4.215	4.056	0.075	0.648
4" Perf	4.215	4.056	0.075	0.648
6" Solid	6.275	6.063	0.100	1.300
6" Perf	6.275	6.063	0.100	1.300



:: Standard Color: White, Standard length: 10' Overall, Belled End Only.

:: Standard perforations for pipe are two rows of holes ½" in diameter on 5" centers and 120° angle apart.

Three perforation rows may be available.

WHEN USING HSP PVC ASTM D2729 SOLVENT WELD DRAIN PIPE FOR SEPTIC TANK FIELDS, PLEASE INSTALL IN ACCORDANCE WITH ASTM F481.

* Prior to ordering or specifying, please consult HSP for product and /or listing availability.

I.D. : Inside Diameter

O.D. : Outside Diameter

T. : Wall Thickness





High Standard Pipe®

DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

HSP SOLAR BLOK - UVR SCHEDULE 40 IPS SIZE

Specifications: [ASTM D1785](#)

Listed : ANSI/NSF 61

Nom. PIPE SIZE (IN)	O.D. (IN)	APPROX. I. d. (IN)	MIN. T. (IN)	PRESSURE RATING (PSI)	APPROX. WEIGHT (LBS/FT)
½	0.840	0.609	0.109	600	0.164
¾	1.050	0.810	0.113	480	0.218
1	1.315	1.033	0.133	450	0.324
1¼	1.660	1.363	0.140	370	0.439
1½	1.900	1.593	0.145	330	0.525
2	2.375	2.049	0.154	280	0.705
2½	2.875	2.445	0.203	300	1.118
3	3.500	3.042	0.216	260	1.463
4	4.500	3.998	0.237	220	2.083

Pipe color is brown.

Pipe is produced with integral Solvent Weld bells.

Available in 20 foot lengths only.

PVC material is specially formulated to increase resistance to ultraviolet rays.

The material includes the maximum amount of titanium dioxide allowed by the PPI PVC Range Composition for pressure pipe applications.





High Standard Pipe®

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FLOW/FRICTION CHARTS

FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SCHEDULE 40

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
½	1	0.90	2.08	1.13	2	30	0.70	1.62	2.93
	2	1.80	4.16	2.26		35	0.93	2.15	3.41
	5	10.15	23.44	5.64		40	1.19	2.75	3.90
	7	13.64	43.06	7.90		45	1.49	3.43	4.39
	10	35.51	82.02	11.28		50	1.80	4.16	4.88
¾	1	0.22	0.51	0.63		60	2.53	5.84	5.85
	2	0.44	1.02	1.26		70	3.36	7.76	6.83
	5	2.48	5.73	3.16		75	3.82	8.82	7.32
	7	4.56	10.52	4.43		80	4.30	9.94	7.80
	10	8.68	20.04	6.32		90	5.36	12.37	8.78
	15	18.39	42.46	9.48		100	6.51	15.03	9.75
	20	31.32	72.34	12.65	2-½	1	—	—	—
1	1	—	—	—		2	—	—	—
	2	0.24	0.55	0.77		5	0.016	0.038	0.30
	5	0.75	1.72	1.93		7	0.023	0.051	0.49
	7	1.37	3.17	2.72		10	0.039	0.09	0.68
	10	2.61	6.02	3.86		15	0.082	0.19	1.03
	15	5.53	12.77	5.79		20	0.14	0.32	1.37
	20	9.42	21.75	7.72		25	0.21	0.49	1.71
	25	14.22	32.88	9.65		30	0.29	0.68	2.05
1¼	30	19.95	46.08	11.58		35	0.39	0.91	2.39
	1	—	—	—		40	0.50	1.16	3.73
	2	0.06	0.14	0.44		45	0.62	1.44	3.08
	5	0.19	0.44	1.11		50	0.76	1.75	3.42
	7	0.35	0.81	1.55		60	1.07	2.46	4.10
	10	0.67	1.55	2.21		70	1.42	3.27	4.79
	15	1.42	3.28	3.31		75	1.61	3.71	5.13
	20	2.42	5.59	4.42		80	1.81	4.19	5.47
	25	3.66	8.45	5.52		90	2.26	5.21	6.15
	30	5.13	11.85	6.63		100	2.74	6.33	6.84
	35	6.82	15.76	7.73		125	4.15	9.58	8.55
	40	8.74	20.18	8.84	3	150	5.81	13.41	10.26
1½	45	10.87	25.10	9.94		1	—	—	—
	50	13.21	30.51	11.05		2	—	—	—
	1	—	—	—		5	0.007	0.015	0.22
	2	0.03	0.07	0.33		7	0.009	0.021	0.31
	5	0.09	0.22	0.81		10	0.013	0.03	0.44
	7	0.17	0.38	1.13		15	0.030	0.07	0.66
	10	0.31	0.72	1.62		20	0.048	0.11	0.88
	15	0.66	1.53	2.42		25	0.074	0.17	1.10
	20	1.13	2.61	3.23		30	0.10	0.23	1.33
	25	1.71	3.95	4.04		35	0.13	0.31	1.55
	30	2.39	5.53	4.85		40	0.17	0.40	1.77
	35	3.19	7.36	5.66		45	0.22	0.50	1.99
2	40	4.08	9.43	6.47		50	0.26	0.60	2.21
	45	5.08	11.73	7.27		60	0.37	0.85	2.65
	50	6.17	14.25	8.08		70	0.49	1.13	3.09
	60	8.65	19.98	9.70		75	0.55	1.28	3.31
	1	—	—	—		80	0.62	1.44	3.53
	2	—	—	—		90	0.78	1.80	3.98
	5	0.029	0.066	0.49		100	0.94	2.18	4.42
	7	0.048	0.11	0.69		125	1.43	3.31	5.52
2	10	0.091	0.21	0.98		150	2.00	4.63	6.63
	15	0.19	0.45	1.46		175	2.67	6.16	7.73
	20	0.33	0.76	1.95		200	3.41	7.88	8.83
	25	0.50	1.15	2.44		250	5.17	11.93	11.04

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.





High Standard Pipe®



FLOW/FRICTION CHARTS

(CONTINUED)

FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SCHEDULE 40 (CONTINUED)

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
4	20	0.013	0.03	0.51	6	175	0.096	0.22	1.97
	25	0.017	0.04	0.64		200	0.12	0.28	2.25
	30	0.026	0.06	0.77		250	0.19	0.43	2.81
	35	0.035	0.08	0.89		300	0.26	0.60	3.37
	40	0.048	0.11	1.02		350	0.34	0.79	3.94
	45	0.056	0.13	1.15		400	0.44	1.01	4.49
	50	0.069	0.16	1.28		450	0.55	1.26	5.06
	60	0.095	0.22	1.53		500	0.66	1.53	5.62
	70	0.13	0.30	1.79		750	1.41	3.25	8.43
	75	0.15	0.34	1.92		1000	2.40	5.54	11.24
	80	0.16	0.38	2.05	8	100	0.012	0.03	0.65
	90	0.20	0.47	2.30		125	0.015	0.035	0.81
	100	0.25	0.58	2.56		150	0.017	0.04	0.97
	125	0.38	0.88	3.20		175	0.024	0.055	1.14
	150	0.53	1.22	3.84		200	0.030	0.07	1.30
	175	0.71	1.63	4.48		250	0.048	0.11	1.63
	200	0.90	2.08	5.11		300	0.069	0.16	1.94
	250	1.36	3.15	6.40		350	0.091	0.21	2.27
	300	1.91	4.41	7.67		400	0.12	0.27	2.59
	350	2.55	5.87	8.95		450	0.14	0.33	2.92
5	400	3.26	7.52	10.23		500	0.17	0.40	3.24
	30	0.009	0.02	0.49		750	0.37	0.85	4.86
	35	0.013	0.03	0.57	10	1000	0.63	1.45	6.48
	40	0.013	0.03	0.65		1250	0.95	2.20	8.11
	45	0.017	0.04	0.73		1500	1.33	3.07	9.72
	50	0.022	0.05	0.81		200	0.012	0.027	0.82
	60	0.030	0.07	0.97		250	0.015	0.035	1.03
	70	0.043	0.10	1.14		300	0.022	0.05	1.23
	75	0.048	0.11	1.22		350	0.028	0.065	1.44
	80	0.056	0.13	1.30		400	0.039	0.09	1.64
	90	0.069	0.16	1.46		450	0.048	0.11	1.85
	100	0.082	0.19	1.62		500	0.056	0.13	2.05
	125	0.125	0.29	2.03	12	750	0.12	0.28	3.08
	150	0.17	0.40	2.44		1000	0.21	0.48	4.11
	175	0.235	0.54	2.84		1250	0.32	0.73	5.14
	200	0.30	0.69	3.25		1500	0.44	1.01	6.16
	250	0.45	1.05	4.06		2000	0.74	1.72	8.21
	300	0.63	1.46	4.87		2500	1.13	2.61	10.27
	350	0.85	1.95	5.69		350	0.012	0.027	1.01
	400	1.08	2.49	6.50		400	0.017	0.04	1.16
	450	1.34	3.09	7.31		450	0.022	0.05	1.30
	500	1.63	3.76	8.12		500	0.026	0.06	1.45
6	50	0.009	0.02	0.56		750	0.052	0.12	2.17
	60	0.013	0.03	0.67		1000	0.087	0.20	2.89
	70	0.017	0.04	0.79		1250	0.13	0.31	3.62
	75	0.022	0.05	0.84		1500	0.19	0.43	4.34
	80	0.022	0.05	0.90		2000	0.32	0.73	5.78
	90	0.026	0.06	1.01		2500	0.49	1.11	7.23
	100	0.035	0.08	1.12		3000	0.67	1.55	8.68
	125	0.052	0.12	1.41		3500	0.90	2.07	10.12
	150	0.069	0.16	1.69		4000	1.15	2.66	11.07

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.





High Standard Pipe®



FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SCHEDULE 80

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
½	1	1.74	4.02	1.48	2	35	1.29	2.99	3.91
	2	3.48	8.03	2.95		40	1.66	3.83	4.47
	5	19.59	45.23	7.39		45	2.07	4.76	5.03
	7	35.97	83.07	10.34		50	2.51	5.79	5.58
	10	—	—	—		60	3.52	8.12	6.70
¾	1	0.37	0.86	0.74		70	4.68	10.80	7.82
	2	0.74	1.72	1.57		75	5.31	12.27	8.38
	5	4.19	9.67	3.92		80	5.99	13.83	8.93
	7	7.69	17.76	5.49		90	7.45	17.20	10.05
	10	14.65	33.84	7.84		100	9.05	20.90	11.17
1	15	31.05	71.70	11.76	2½	1	—	—	—
	1	—	—	—		2	—	—	—
	2	0.38	0.88	0.94		5	0.022	0.05	0.39
	5	1.19	2.75	2.34		7	0.032	0.07	0.54
	7	2.19	5.04	3.28		10	0.052	0.12	0.78
	10	4.16	9.61	4.68		15	0.11	0.26	1.17
	15	8.82	20.36	7.01		20	0.19	0.44	1.56
	20	15.02	34.68	9.35		25	0.29	0.67	1.95
1¼	25	22.70	52.43	11.69		30	0.41	0.94	2.34
	30	31.82	73.48	14.03		35	0.54	1.25	2.73
	1	—	—	—		40	0.69	1.60	3.12
	2	0.09	0.21	0.52		45	0.86	1.99	3.51
	5	0.29	0.66	1.30		50	1.05	2.42	3.90
	7	0.53	1.21	1.82		60	1.47	3.39	4.68
	10	1.00	2.30	2.60		70	1.95	4.51	5.46
	15	2.11	4.87	3.90		75	2.22	5.12	5.85
	20	3.59	8.30	5.20		80	2.50	5.77	6.24
	25	5.43	12.55	6.50		90	3.11	7.18	7.02
	30	7.62	17.59	7.80		100	3.78	8.72	7.80
	35	10.13	23.40	9.10	3	125	5.72	13.21	9.75
1½	40	12.98	29.97	10.40		150	8.00	18.48	11.70
	45	16.14	37.27	11.70		1	—	—	—
	50	19.61	45.30	13.00		2	—	—	—
	1	—	—	—		5	0.009	0.02	0.25
	2	0.041	0.10	0.38		7	0.012	0.028	0.35
	5	0.126	0.30	0.94		10	0.017	0.04	0.50
	7	0.24	0.55	1.32		15	0.039	0.09	0.75
	10	0.45	1.04	1.88		20	0.065	0.15	1.00
	15	0.95	2.20	2.81		25	0.095	0.22	1.25
	20	1.62	3.75	3.75		30	0.13	0.31	1.49
	25	2.46	5.67	4.69		35	0.18	0.42	1.74
	30	3.44	7.95	5.63		40	0.23	0.54	1.99
2	35	4.58	10.58	6.57		45	0.29	0.67	2.24
	40	5.87	13.55	7.50		50	0.35	0.81	2.49
	45	7.30	16.85	8.44		60	0.49	1.14	2.99
	50	8.87	20.48	9.38		70	0.65	1.51	3.49
	60	12.43	28.70	11.26		75	0.74	1.72	3.74
	1	—	—	—		80	0.84	1.94	3.99
	2	—	—	—		90	1.04	2.41	4.48
	5	0.040	0.10	0.56		100	1.27	2.93	4.98
2	7	0.065	0.15	0.78		125	1.92	4.43	6.23
	10	0.13	0.29	1.12		150	2.68	6.20	7.47
	15	0.27	0.62	1.68		175	3.58	8.26	8.72
	20	0.46	1.06	2.23		200	4.58	10.57	9.97
	25	0.69	1.60	2.79		250	6.93	16.00	12.46
	30	0.97	2.25	3.35		—	—	—	—

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.





High Standard Pipe®



FLOW/FRICTION CHARTS

(CONTINUED)

FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SCHEDULE 80 (CONTINUED)

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
4	20	0.017	0.04	0.57	6	175	0.12	0.29	2.20
	25	0.026	0.06	0.72		200	0.16	0.37	2.51
	30	0.035	0.08	0.86		250	0.24	0.56	3.14
	35	0.048	0.11	1.00		300	0.34	0.78	3.76
	40	0.061	0.14	1.15		350	0.45	1.04	4.39
	45	0.074	0.17	1.29		400	0.58	1.33	5.02
	50	0.091	0.21	1.43		450	0.71	1.65	5.64
	60	0.13	0.30	1.72		500	0.87	2.00	6.27
	70	0.17	0.39	2.01		750	1.84	4.25	9.40
	75	0.19	0.45	2.15		1000	3.13	7.23	12.54
	80	0.22	0.50	2.29	8	125	0.019	0.045	0.90
	90	0.27	0.63	2.58		150	0.022	0.05	1.07
	100	0.33	0.76	2.87		175	0.033	0.075	1.25
	125	0.50	1.16	3.59		200	0.039	0.09	1.43
	150	0.70	1.61	4.30		250	0.61	0.14	1.79
	175	0.93	2.15	5.02		300	0.087	0.20	2.14
	200	1.19	2.75	5.73		350	0.12	0.27	2.50
	250	1.81	4.16	7.16		400	0.15	0.34	2.86
	300	2.52	5.83	8.60		450	0.18	0.42	3.21
	350	3.36	7.76	10.03		500	0.22	0.51	3.57
5	400	4.30	9.93	11.47		750	0.47	1.08	5.36
	30	0.013	0.03	0.54	10	1000	0.80	1.84	7.14
	35	0.017	0.04	0.63		1250	1.20	2.78	8.93
	40	0.017	0.04	0.72		1500	1.68	3.89	10.71
	45	0.026	0.06	0.81		200	0.015	0.036	0.90
	50	0.030	0.07	0.90		250	0.02	0.045	1.14
	60	0.043	0.10	1.08		300	0.03	0.07	1.36
	70	0.056	0.13	1.26		350	0.037	0.085	1.59
	75	0.061	0.14	1.35		400	0.048	0.11	1.81
	80	0.069	0.16	1.44		450	0.061	0.14	2.04
	90	0.087	0.20	1.62		500	0.074	0.17	2.27
	100	0.10	0.24	1.80	12	750	0.16	0.36	3.40
	125	0.16	0.37	2.25		1000	0.26	0.61	4.54
	150	0.23	0.52	2.70		1250	0.40	0.92	5.67
	175	0.30	0.69	3.15		1500	0.56	1.29	6.80
	200	0.38	0.88	3.60		2000	0.95	2.19	9.07
	250	0.58	1.34	4.50		2500	1.44	3.33	11.34
	300	0.81	1.87	5.40		350	0.016	0.037	1.12
	350	1.08	2.49	6.30		400	0.022	0.05	1.28
	400	1.38	3.19	7.19		450	0.026	0.06	1.44
	450	1.72	3.97	8.09		500	0.030	0.07	1.60
6	500	2.09	4.82	8.99		750	0.065	0.15	2.40
	50	0.013	0.03	0.63		1000	0.11	0.26	3.20
	60	0.017	0.04	0.75		1250	0.17	0.40	4.01
	70	0.022	0.05	0.88		1500	0.24	0.55	4.81
	75	0.026	0.06	0.94		2000	0.41	0.94	6.41
	80	0.030	0.07	1.00		2500	0.62	1.42	8.01
	90	0.035	0.08	1.13		3000	0.86	1.99	9.61
	100	0.043	0.10	1.25		3500	1.15	2.65	11.21
	125	0.068	0.16	1.57		4000	1.48	3.41	12.82
	150	0.095	0.22	1.88		—	—	—	—

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.



High Standard Pipe®



FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SDR 13.5

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
½	1	0.45	1.03	0.85	2	30	0.78	1.80	3.06
	2	0.89	2.05	1.69		35	1.04	2.40	3.57
	5	5.01	11.58	4.22		40	1.33	3.07	4.08
	7	9.20	21.24	5.91		45	1.65	3.82	4.59
	10	17.52	40.46	8.44		50	2.01	4.64	5.10
¾	1	0.15	0.34	0.54		60	2.81	6.50	6.12
	2	0.29	0.68	1.07		70	3.75	8.65	7.14
	5	1.65	3.82	2.68		75	4.26	9.83	7.65
	7	3.03	7.01	3.75		80	4.80	11.08	8.16
	10	5.78	13.34	5.35		90	5.97	13.78	9.18
	15	12.24	28.27	8.03		100	7.25	16.75	10.20
	20	20.86	48.17	10.70	2½	1	—	—	—
1	1	—	—	—		2	—	—	—
	2	0.17	0.40	0.68		5	0.016	0.038	0.35
	5	0.54	1.24	1.69		7	0.023	0.053	0.49
	7	0.99	2.28	2.36		10	0.039	0.09	0.70
	10	1.87	4.33	3.37		15	0.087	0.20	1.04
	15	3.97	9.18	5.06		20	0.15	0.34	1.39
	20	6.77	15.64	6.74		25	0.22	0.51	1.74
	25	10.24	23.65	8.43		30	0.31	0.71	2.09
1¼	30	14.35	33.15	10.11		35	0.41	0.95	2.44
	1	—	—	—		40	0.52	1.21	2.78
	2	0.06	0.13	0.42		45	0.65	1.51	3.13
	5	0.17	0.39	1.05		50	0.79	1.83	3.48
	7	0.31	0.72	1.47		60	1.11	2.57	4.18
	10	0.59	1.37	2.10		70	1.48	3.42	4.87
	15	1.26	2.91	3.15		75	1.68	3.88	5.22
	20	2.15	4.96	4.21		80	1.89	4.37	5.57
	25	3.24	7.49	5.26		90	2.36	5.44	6.27
	30	4.55	10.50	6.31		100	2.86	6.61	6.96
	35	6.05	13.97	7.36		125	4.33	10.01	8.70
	40	7.75	17.90	8.41	3	150	6.07	14.01	10.44
1½	45	9.64	22.26	9.4		1	—	—	—
	50	11.71	27.05	10.52		2	—	—	—
	1	—	—	—		5	0.009	0.02	0.24
	2	0.028	0.065	0.32		7	0.012	0.03	0.33
	5	0.088	0.20	0.80		10	0.017	0.04	0.47
	7	0.16	0.37	1.12		15	0.035	0.08	0.70
	10	0.31	0.71	1.60		20	0.056	0.13	0.94
	15	0.65	1.50	2.40		25	0.082	0.19	1.17
	20	1.10	2.55	3.20		30	0.12	0.27	1.41
	25	1.67	3.85	4.00		35	0.16	0.36	1.64
	30	2.34	5.40	4.80		40	0.20	0.46	1.88
	35	3.11	7.19	5.60		45	0.25	0.58	2.11
2	40	3.98	9.20	6.40		50	0.30	0.70	2.35
	45	4.95	11.44	7.20		60	0.42	0.98	2.82
	50	6.02	13.91	8.00		70	0.57	1.31	3.29
	60	8.44	19.50	9.60		75	0.65	1.49	3.52
	1	—	—	—		80	0.73	1.68	3.76
	2	0.013	0.03	0.20		90	0.90	2.09	4.23
	5	0.033	0.075	0.51		100	1.10	2.54	4.70
	7	0.054	0.125	0.72		125	1.66	3.84	5.88
2	10	0.10	0.24	1.02		150	2.33	5.37	7.04
	15	0.22	0.50	1.53		175	3.10	7.15	8.22
	20	0.37	0.85	2.04		200	3.96	9.15	9.39
	25	0.56	1.29	2.55		250	6.00	13.86	11.74

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.





High Standard Pipe®



FLOW/FRICTION CHARTS

(CONTINUED)

FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SDR 13.5 (CONTINUED)

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
4	20	0.017	0.04	0.57	5	100	0.12	0.27	1.86
	25	0.026	0.06	0.71		125	0.18	0.40	2.33
	30	0.035	0.08	0.85		150	0.24	0.56	2.79
	35	0.048	0.11	0.99		175	0.33	0.75	3.26
	40	0.060	0.14	1.14		200	0.42	0.96	3.72
	45	0.074	0.17	1.28		250	0.63	1.46	4.66
	50	0.091	0.21	1.42		300	0.88	2.03	5.58
	60	0.13	0.29	1.70		350	1.17	2.70	6.52
	70	0.16	0.38	1.99		400	1.50	3.46	7.44
	75	0.19	0.44	2.13		450	1.87	4.31	8.37
	80	0.21	0.49	2.27	6	500	2.27	5.24	9.30
	90	0.26	0.61	2.56		50	0.013	0.03	0.66
	100	0.32	0.74	2.84		60	0.017	0.04	0.79
	125	0.49	1.13	3.55		70	0.026	0.06	0.92
	150	0.68	1.58	4.26		75	0.030	0.07	0.98
	175	0.91	2.10	4.97		80	0.035	0.08	1.05
	200	1.16	2.69	5.68		90	0.039	0.09	1.18
	250	1.76	4.07	7.10		100	0.048	0.11	1.31
	300	2.46	5.69	8.52		125	0.074	0.17	1.64
	350	3.29	7.58	9.94		150	0.10	0.24	1.97
	400	4.20	9.70	11.36		175	0.14	0.32	2.30
5	30	0.013	0.03	0.56		200	0.18	0.41	2.62
	35	0.017	0.04	0.65		250	0.27	0.62	3.28
	40	0.022	0.05	0.74		300	0.38	0.87	3.93
	45	0.026	0.06	0.84		350	0.50	1.16	4.59
	50	0.030	0.07	0.93		400	0.64	1.48	5.24
	60	0.043	0.10	1.12		450	0.80	1.84	5.90
	70	0.061	0.14	1.30		500	0.97	2.23	6.56
	75	0.069	0.16	1.40		750	2.05	4.73	9.83
	80	0.078	0.18	1.49		1000	3.49	8.06	13.11
	90	0.095	0.22	1.67		—	—	—	—

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.



High Standard Pipe®



FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SDR 21

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
½	1	0.44	1.00	0.84	2	25	0.41	0.95	2.25
	2	0.87	2.00	1.67		30	0.58	1.34	2.71
	5	4.87	11.25	4.17		35	0.77	1.78	3.16
	7	8.95	20.66	5.84		40	0.98	2.27	3.61
	10	17.03	39.34	8.34		45	1.23	2.83	4.06
¾	1	0.12	0.28	0.50		50	1.49	3.44	4.51
	2	0.24	0.56	0.99		60	2.09	4.82	5.41
	5	1.36	3.14	2.47		70	2.78	6.41	6.31
	7	2.49	5.76	3.46		75	3.16	7.29	6.76
	10	4.75	10.96	4.94		80	3.55	8.21	7.21
	15	10.06	23.23	7.40		90	4.42	10.21	8.12
	20	17.13	39.57	9.87		100	5.37	12.41	9.02
1	2	0.13	0.30	0.60	2½	1	—	—	—
	5	0.41	0.93	1.50		2	—	—	—
	7	0.74	1.70	2.09		5	0.014	0.031	0.031
	10	1.40	3.24	2.99		7	0.020	0.044	0.43
	15	2.97	6.86	4.49		10	0.03	0.07	0.61
	20	5.06	11.68	5.98		15	0.61	0.14	0.92
	25	7.65	17.66	7.48		20	0.11	0.25	1.23
	30	10.72	24.76	8.97		25	0.16	0.37	1.53
	35	14.26	32.94	10.47		30	0.23	0.52	1.84
1¼	2	0.04	0.095	0.37		35	0.30	0.70	2.15
	5	0.13	0.30	0.93		40	0.39	0.89	2.45
	7	0.23	0.54	1.31		45	0.48	1.11	2.76
	10	0.44	1.02	1.86		50	0.58	1.35	3.07
	15	0.94	2.16	2.79		60	0.82	1.89	3.68
	20	1.59	3.68	3.72		70	1.09	2.51	4.29
	25	2.41	5.56	4.65		75	1.23	2.85	4.60
	30	3.38	7.80	5.58		80	1.39	3.22	4.91
	35	4.49	10.37	6.51		90	1.73	4.00	5.52
	40	5.75	13.28	7.44		100	2.10	4.86	6.14
	45	7.15	16.52	8.37		125	3.19	7.36	7.67
	50	8.69	20.08	9.30		150	4.46	10.30	9.20
1½	60	12.18	28.14	11.17		175	5.94	13.72	10.74
	2	0.022	0.05	0.29	3	5	0.006	0.015	0.20
	5	0.065	0.15	0.71		7	0.009	0.021	0.29
	7	0.12	0.28	0.99		10	0.013	0.03	0.41
	10	0.23	0.52	1.41		15	0.026	0.06	0.62
	15	0.48	1.11	2.12		20	0.039	0.09	0.83
	20	0.82	1.89	2.83		25	0.061	0.14	1.03
	25	1.23	2.85	3.54		30	0.087	0.20	1.24
	30	1.73	4.00	4.24		35	0.12	0.27	1.45
	35	2.30	5.32	4.95		40	0.15	0.34	1.65
	40	2.95	6.81	5.66		45	0.18	0.42	1.86
	45	3.67	8.47	6.36		50	0.22	0.51	2.06
	50	4.46	10.29	7.07		60	0.31	0.72	2.48
	60	6.24	14.42	8.49		70	0.42	0.96	2.89
2	70	8.31	19.19	9.90		75	0.47	1.09	3.10
	75	9.44	21.80	10.61		80	0.53	1.23	3.30
	1	—	—	—		90	0.66	1.52	3.72
	2	0.010	0.023	0.18		100	0.80	1.85	4.13
	5	0.025	0.06	0.45		125	1.22	2.81	5.17
	7	0.035	0.081	0.63		150	1.70	3.93	6.19
	10	0.074	0.17	0.90		175	2.26	5.23	7.23
	15	0.16	0.37	1.35		200	2.90	6.69	8.26
	20	0.27	0.63	1.80		250	4.39	10.13	10.33

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.





High Standard Pipe®



FLOW/FRICTION CHARTS

(CONTINUED)

FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SDR 21 (CONTINUED)

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
4	20	0.013	0.03	0.50	6	175	0.103	0.24	2.02
	25	0.017	0.04	0.62		200	0.13	0.30	2.31
	30	0.026	0.06	0.75		250	0.20	0.46	2.89
	35	0.035	0.08	0.87		300	0.27	0.63	3.46
	40	0.043	0.10	1.00		350	0.37	0.85	4.04
	45	0.052	0.12	1.12		400	0.47	1.08	4.61
	50	0.065	0.15	1.25		450	0.58	1.34	5.19
	60	0.091	0.21	1.50		500	0.71	1.63	5.76
	70	0.12	0.28	1.75		750	1.50	3.46	8.64
	75	0.14	0.32	1.87		1000	2.55	5.89	11.53
	80	0.16	0.36	2.00	8	100	0.012	0.03	0.67
	90	0.19	0.45	2.25		125	0.015	0.037	0.85
	100	0.23	0.54	2.50		150	0.022	0.05	1.02
	125	0.36	0.82	3.13		175	0.028	0.065	1.19
	150	0.50	1.15	3.75		200	0.035	0.08	1.36
	175	0.67	1.54	4.37		250	0.054	0.125	1.70
	200	0.85	1.96	4.99		300	0.078	0.18	2.04
	250	1.29	2.97	6.24		350	0.103	0.24	2.38
	300	1.80	4.16	7.49		400	0.13	0.30	2.72
	350	2.40	5.54	8.74		450	0.16	0.37	3.06
5	400	3.07	7.09	9.99		500	0.19	0.45	3.40
	450	3.82	8.82	11.24		750	0.42	0.96	5.10
	500	4.64	10.72	12.48		1000	0.64	1.63	6.80
	30	0.009	0.02	0.49	10	1250	1.07	2.47	8.50
	35	0.013	0.03	0.57		1500	1.49	3.45	10.19
	40	0.017	0.04	0.65		2000	2.54	5.87	13.59
	45	0.017	0.04	0.74		200	0.012	0.027	0.86
	50	0.022	0.05	0.82		250	0.020	0.045	1.10
	60	0.035	0.08	0.98		300	0.026	0.06	1.31
	70	0.043	0.10	1.14		350	0.035	0.08	1.54
	75	0.048	0.11	1.23		400	0.043	0.10	1.75
	80	0.056	0.13	1.31		450	0.056	0.13	1.97
	90	0.069	0.16	1.47		500	0.065	0.15	2.19
	100	0.082	0.19	1.63	12	750	0.14	0.33	3.29
	125	0.13	0.30	2.04		1000	0.24	0.56	4.38
	150	0.18	0.41	2.45		1250	0.37	0.85	5.48
	175	0.24	0.55	2.86		1500	0.51	1.18	6.57
	200	0.30	0.70	3.27		2000	0.87	2.02	8.76
	250	0.46	1.06	4.09		2500	1.33	3.06	10.96
	300	0.64	1.48	4.90		3000	1.85	4.27	13.15
	350	0.86	1.98	5.72		350	0.016	0.036	1.08
	400	1.10	2.53	6.54		400	0.017	0.04	1.24
	450	1.36	3.14	7.35		450	0.026	0.06	1.40
6	500	1.65	3.82	8.17		500	0.030	0.07	1.55
	750	3.50	8.09	12.26		750	0.061	0.14	2.33
	50	0.009	0.02	0.58		1000	0.10	0.24	3.11
	60	0.013	0.03	0.69		1250	0.16	0.37	3.89
	70	0.017	0.04	0.81		1500	0.22	0.51	4.66
	75	0.022	0.05	0.86		2000	0.38	0.87	6.22
	80	0.022	0.05	0.92		2500	0.57	1.33	7.77
	90	0.030	0.07	1.04		3000	0.80	1.85	9.33
	100	0.035	0.08	1.15		3500	1.07	2.47	10.88
	125	0.054	0.125	1.44		4000	1.37	3.17	12.44
	150	0.078	0.18	1.73		4500	1.70	3.93	13.99

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.





High Standard Pipe®



FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SDR 26

SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)	SIZE (IN)	FLOW (GAL/MIN)	FRICTION LOSS (PSI)	FRICTION HEAD (FT)	VELOCITY (FT/S)
1/2	1	0.43	1.00	0.84	2	20	0.25	0.57	1.73
	2	0.86	2.00	1.67		25	0.37	0.86	2.16
	5	4.87	11.25	4.17		30	0.52	1.21	2.60
	7	8.95	20.66	5.84		35	0.70	1.61	3.03
	10	17.03	39.34	8.34		40	0.89	2.06	3.46
3/4	1	0.12	0.28	0.50		45	1.11	2.56	3.90
	2	0.24	0.56	0.99		50	1.35	3.11	4.33
	5	1.36	3.14	2.47		60	1.89	4.36	5.19
	7	2.49	5.76	3.46		70	2.51	5.80	6.06
	10	4.74	10.96	4.94		75	2.86	6.60	6.49
	15	10.06	23.23	7.40		80	3.22	7.43	6.92
	20	17.13	39.57	9.87		90	4.01	9.25	7.79
1	2	0.13	0.29	0.59		100	4.87	11.24	8.66
	5	0.39	0.91	1.48	2 1/2	1	—	—	—
	7	0.72	1.66	2.08		2	—	—	—
	10	1.37	3.16	2.96		5	0.011	0.025	0.30
	15	2.90	6.69	4.44		7	0.015	0.035	0.42
	20	4.94	11.40	5.92		10	0.026	0.06	0.59
	25	7.46	17.23	7.40		15	0.056	0.13	0.88
	30	10.46	24.15	8.88		20	0.095	0.22	1.18
	35	13.91	32.13	10.36		25	0.15	0.34	1.47
1 1/4	2	0.037	0.085	0.36		30	0.20	0.47	1.77
	5	0.117	0.27	0.90		35	0.27	0.63	2.06
	7	0.21	0.49	1.25		40	0.35	0.81	2.35
	10	0.40	0.92	1.79		45	0.43	1.00	2.65
	15	0.85	1.96	2.68		50	0.53	1.22	2.94
	20	1.45	3.34	3.58		60	0.74	1.71	3.53
	25	2.18	5.04	4.47		70	0.98	2.27	4.12
	30	3.06	7.07	5.36		75	1.12	2.58	4.41
	35	4.07	9.41	6.26		80	1.26	2.91	4.71
	40	5.22	12.05	7.15		90	1.57	3.62	5.30
	45	6.49	14.98	8.04		100	1.90	4.39	5.89
1 1/2	50	7.88	18.21	8.94		125	2.88	6.65	7.36
	2	0.0087	0.02	0.27	3	150	4.03	9.31	8.83
	5	0.059	0.14	0.68		175	5.37	12.40	10.31
	7	0.104	0.25	0.96		5	0.0045	0.01	0.20
	10	0.20	0.47	1.36		7	0.0063	0.014	0.28
	15	0.43	1.00	2.04		10	0.009	0.02	0.40
	20	0.74	1.71	2.72		15	0.022	0.05	0.59
	25	1.12	2.59	3.40		20	0.039	0.09	0.79
	30	1.57	3.63	4.08		25	0.056	0.13	0.99
	35	2.09	4.83	4.76		30	0.078	0.18	1.19
	40	2.68	6.18	5.44		35	0.10	0.24	1.39
	45	3.33	7.69	6.12		40	0.13	0.31	1.59
	50	4.04	9.34	6.80		45	0.16	0.38	1.78
	60	5.67	13.10	8.16		50	0.20	0.47	1.98
2	70	7.54	17.42	9.52		60	0.28	0.65	2.38
	75	8.57	19.80	10.19		70	0.38	0.87	2.78
	80	9.66	22.31	10.87		75	0.43	0.99	2.97
	90	12.02	27.75	12.23		80	0.48	1.11	3.17
	100	14.61	33.73	13.59		90	0.60	1.38	3.57
	1	—	—	—		100	0.73	1.68	3.97
	2	0.004	0.01	0.17		125	1.10	2.54	4.96
	5	0.020	0.045	0.44		150	1.54	3.56	5.95
	7	0.035	0.08	0.61		175	2.05	4.74	6.94
	10	0.069	0.16	0.87		200	2.63	6.07	7.93
	15	0.14	0.33	1.30		250	3.98	9.18	9.92

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.





High Standard Pipe®



FLOW/FRICTION CHARTS (CONTINUED)

FLOW / FRICTION LOSS, SOLVENT WELD PVC PIPE

SDR 26 (CONTINUED)

SIZE (IN)	Flow (gAL/mIN)	FrlcTloN LoSS (psi)	FrlcTloN hEAd (FT)	vELoc ITy (FT/S)	SIZE (IN)	Flow (gAL/mIN)	FrlcTloN LoSS (psi)	FrlcTloN hEAd (FT)	vELoc ITy (FT/S)
4	20	0.009	0.02	0.48	6	175	0.091	0.21	1.94
	25	0.017	0.04	0.60		200	0.12	0.27	2.21
	30	0.022	0.05	0.72		250	0.18	0.41	2.76
	35	0.030	0.07	0.84		300	0.25	0.57	3.31
	40	0.039	0.09	0.96		350	0.33	0.76	3.87
	45	0.048	0.11	1.08		400	0.42	0.97	4.42
	50	0.061	0.14	1.20		450	0.52	1.21	4.97
	60	0.082	0.19	1.44		500	0.64	1.47	5.52
	70	0.11	0.25	1.67		750	1.35	3.12	8.28
	75	0.13	0.29	1.79		1000	2.30	5.31	11.05
	80	0.14	0.32	1.91	8	100	0.012	0.03	0.66
	90	0.17	0.40	2.15		125	0.015	0.037	0.83
	100	0.21	0.49	2.39		150	0.017	0.04	0.98
	125	0.33	0.74	2.99		175	0.026	0.06	1.14
	150	0.45	1.04	3.50		200	0.030	0.07	1.30
	175	0.60	1.39	4.19		250	0.048	0.11	1.63
	200	0.77	1.77	4.79		300	0.069	0.16	1.95
	250	1.16	2.68	5.98		350	0.091	0.21	2.28
	300	1.62	3.75	7.18		400	0.12	0.27	2.61
	350	2.17	5.00	8.38		450	0.14	0.33	2.93
5	400	2.77	6.39	9.57		500	0.18	0.41	3.26
	450	3.44	7.95	10.77		750	0.37	0.86	4.89
	500	4.18	9.66	11.96		1000	0.64	1.47	6.51
	30	0.009	0.02	0.47		1250	0.96	2.23	8.15
	35	0.013	0.03	0.55		1500	1.35	3.11	9.77
	40	0.013	0.03	0.63		2000	2.29	5.30	13.03
	45	0.017	0.04	0.71	10	200	0.012	0.027	0.83
	50	0.022	0.05	0.78		250	0.017	0.04	1.05
	60	0.030	0.07	0.94		300	0.022	0.05	1.26
	70	0.039	0.09	1.10		350	0.033	0.075	1.47
	75	0.043	0.10	1.18		400	0.039	0.09	1.68
	80	0.052	0.12	1.25		450	0.048	0.11	1.89
	90	0.061	0.14	1.41		500	0.061	0.14	2.10
	100	0.078	0.18	1.57		750	0.13	0.29	3.14
	125	0.12	0.27	1.96		1000	0.22	0.50	4.19
	150	0.16	0.37	2.35		1250	0.33	0.76	5.27
6	175	0.22	0.50	2.74		1500	0.46	1.06	6.29
	200	0.27	0.63	3.13		2000	0.78	1.81	8.38
	250	0.42	0.96	3.92	12	2500	1.19	2.74	10.48
	300	0.58	1.34	4.70		3000	1.66	3.84	12.58
	350	0.77	1.79	5.49		350	0.017	0.04	1.04
	400	0.99	2.28	6.27		400	0.017	0.04	1.19
	450	1.23	2.84	7.05		450	0.022	0.05	1.34
	500	1.49	3.45	7.84		500	0.026	0.06	1.49
	750	3.17	7.31	11.75		750	0.056	0.13	2.23
	50	0.009	0.02	0.55		1000	0.095	0.22	2.98
	60	0.013	0.03	0.66		1250	0.15	0.34	3.73
	70	0.017	0.04	0.77		1500	0.20	0.46	4.47
	75	0.017	0.04	0.83		2000	0.34	0.79	5.96
	80	0.022	0.05	0.88		2500	0.52	1.20	7.45
	90	0.026	0.06	0.99		3000	0.72	1.67	8.94
	100	0.030	0.07	1.10		3500	0.96	2.22	10.43
	125	0.047	0.11	1.39		4000	1.24	2.86	11.92
	150	0.066	0.16	1.66		4500	1.53	3.54	13.41

* For data, sizes, or classes not reflected in these charts, please contact HSP for assistance.





High Standard Pipe®

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SHORT FORM INSTALLATION GUIDE/ WARNING

This information is furnished in order to provide a brief review of the installation requirements for HSP Solvent Weld PVC pipe. It is not intended to serve as or replace the function of the FULL VERSION product installation guide available upon request.

1. Use a good quality ABS cement and primer which meets ASTM D2235 for ABS pipe only. For PVC pipe, use a good quality PVC cement and primer which meets ASTM D2564.
2. Cut pipe to desired length with pipe cutters, hacksaw, or cross cut saw.
3. Ream pipe both internally and externally or remove burrs and ragged edges.
4. Before making Solvent Weld joint be sure all joining surfaces are free of dirt, dust, water, and oil.
5. Immediately apply a smooth coat of primer and cement to the joining surfaces.
6. Immediately insert the pipe into the full depth of the fitting socket.
7. Turn pipe to 1/8 turn in the socket to ensure an even spread of cement.
8. hold firmly in position for 15 seconds.
9. Allow joint to set according to cement manufacturer's instructions.
10. Curvature of the pipe shall be accomplished through longitudinal bending of the pipe barrel in accordance with the following table. Deflection of the joint is not allowed and may cause leaks.

PIPE SIZE (IN)	RADIUS (FT)	PIPE SIZE (IN)	RADIUS (FT)	PIPE SIZE (IN)	RADIUS (FT)
1.5	38	3	75	8	200
2	50	4	100	10	250
2.5	63	6	150	12	300

WARNING: RUPTURE HAZARD

IMPROPER INSTALLATION OR MISUSE OF TAPPING TOOLS MAY CAUSE PIPES UNDER HIGH PRESSURE TO RUPTURE AND RESULT IN HIGH VELOCITY AIRBORNE FRAGMENTATION LEADING TO SERIOUS INJURIES AND/OR DEATH.

BEFORE AND DURING INSTALLATION, ALWAYS:

- Consult and follow the FULL VERSION of the product installation guide
- Closely follow job specifications
- Use protective gear and equipment

BEFORE AND DURING TAPPING, ALWAYS:

- Use the correct tapping tools
- Bleed air from pipes at high spot before tapping
- Use protective gear and equipment

Please contact HSP Product Assurance at +93 799 361046, to obtain FULL VERSION of the appropriate installation guide or for further assistance.



WARRANTY

HSP PRODUCTS LIMITED WARRANTY

High Standard Pipe (HSP) warrants that its standard polyvinyl chloride (PVC), polyethylene (PE), conduit/plumbing/solvent weld and Acrylonitrile-Butadiene-Styrene (ABS) pipe Products ("Products") are manufactured in accordance with applicable industry specifications referenced on the Product and are free from defects in workmanship and materials. Every claim under this warranty shall be void unless in writing and received by HSP within thirty (30) days of the date the defect was discovered, and within one (1) year of the date of shipment from the HSP plant.

Claims for Product appearance defects, such as sun-bleached pipe etc., however, must be made within thirty (30) days of the date of the shipment from the HSP plant. This warranty specifically excludes any Products allowed to become sun-bleached after shipment from the HSP plant. Proof of purchase with the date thereof must be presented to the satisfaction of HSP, with any claim made pursuant to this warranty. HSP must first be given an opportunity to inspect the alleged defective Products in order to determine if it meets applicable industry standards, if the handling and installation have been satisfactorily performed in accordance with HSP recommended practices and if operating conditions are within standards. Written permission and/or a Return Goods Authorization (RGA) must be obtained along with instructions for return shipment to HSP of any Products claimed to be defective.

The limited and exclusive remedy for breach of this Limited Warranty shall be, at HSP's sole discretion, the replacement of the same type, size and like quantity of non-defective Product, or credits, offsets, or combination of thereof, for the wholesale purchase price of the defective unit. This Limited Warranty does not apply for any Product failures caused by user's flawed designs or specifications, unsatisfactory applications, improper installations, use in conjunction with incompatible materials, contact with aggressive chemical agents, freezing or overheating of liquids in the product and any other misuse causes not listed here. This Limited Warranty also excludes failure or damage caused by fire stopping materials, thread sealants, plasticized vinyl Products or damage caused by the fault or negligence of anyone other than HSP, or any other act or event beyond the control of HSP.

HSP's liability shall not, at any time, exceed the actual wholesale purchase price of the Product. The warranties in this document are the only warranties applicable to the Product and there are no other warranties, expressed or implied. This Limited Warranty specifically excludes any liability for general damages, consequential or incidental damages, including without limitation, costs incurred from removal, reinstallation, or other expenses resulting from any defect. IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE SPECIFICALLY DISCLAIMED AND HSP SHALL NOT BE LIABLE IN THIS RESPECT NOTWITHSTANDING HSP'S ACTUAL KNOWLEDGE THE PRODUCT'S INTENDED USE.

HSP's Products should be used in accordance with standards set forth by local plumbing and building laws, codes, or regulations and the applicable standards. Failure to adhere to these standards shall void this Limited Warranty. Products sold by HSP that are manufactured by others are warranted only to the extent and limits of the warranty of the manufacturer. No statement, conduct or description by HSP or its representative, in addition to or beyond this Limited Warranty, shall constitute a warranty. This Limited Warranty may only be modified in writing signed by an officer of HSP.

HSP Sales Branches in



HSP Kabul 1st Distributor

Between Haji Yaqoob Square and Ansari Square, Shar-e-Naw
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Kabul@highstandardpipe.com

HSP Kabul 2nd Distributor

Between Gul – e – Surkh Square and Market,
Besides Azizi Bank, Kolola Pushta
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HSP Jalalabad

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HSP Herat

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HSP Mazar-e-Sharif

Haji Bismillah Market, East to Rowzey Sharif,
Ahmad Shah Masoud Road
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QUALITY IS OUR PROFESSION



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