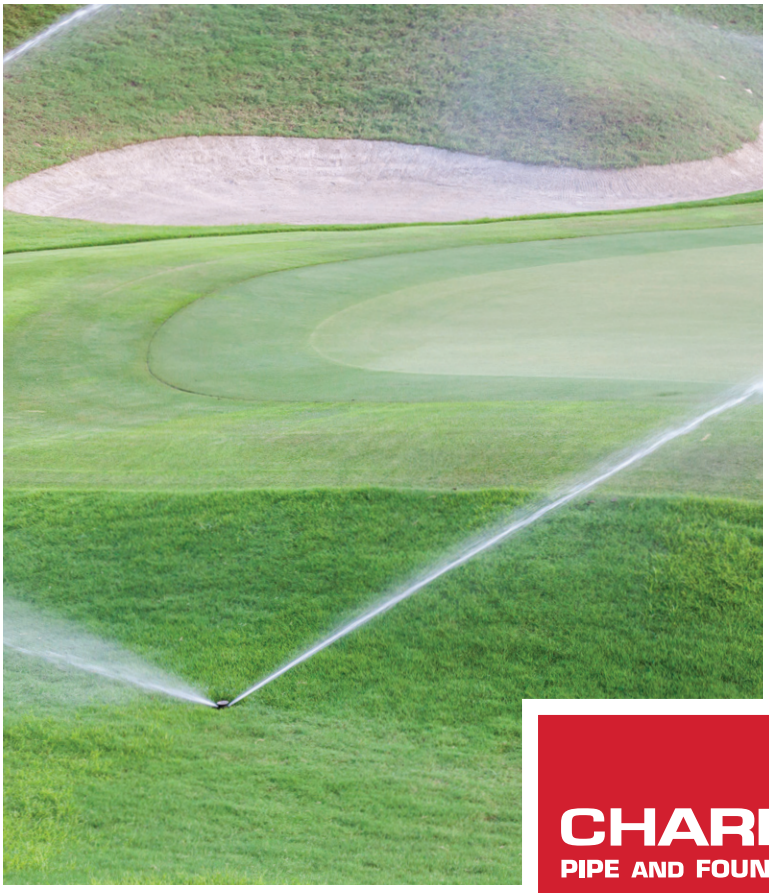
IRRIGATION TECHNICAL GUIDE



CHARLOTTE
PIPE AND FOUNDRY COMPANY

IRRIGATION

Family-Owned Since 1901– Trust Charlotte Pipe® for All Your Irrigation Product Needs.

Charlotte Pipe has a proud heritage of family ownership that goes back four generations, and it still operates on the philosophy of founder Willis Frank Dowd — provide the best service for the customer and produce the best product possible.

The company offers a complete line of irrigation piping — all proudly made in the USA to the highest quality standards.

- PVC PIP PR 50/SDR 81 THROUGH PR 200/SDR 21
- PVC PR 100/SDR 41 THROUGH PR 315/SDR 13.5
- PVC D3034/SDR 35 SEWER
- PVC SCH 40 AND SCH 80
- PVC SOLVENT WELD, GASKET, PURPLE RECLAIMED

Get What You Need, When You Need It.

Charlotte Pipe's packaging and shipping systems allow quick delivery of large or small quantities. Our pallet configurations and bundles are designed for easy storage in your yard and to simplify picking and delivery.

We offer many options, including:

- Job site delivery — product shipments to your specific project location*
- Flexible freight — partial-truck and mixed-truckload, and non-peak orders.
- Regional stock — Charlotte Pipe's irrigation pipe is manufactured and stocked in six plants throughout the United States.

*based on minimum pallet quantities

World-Class Customer Service.

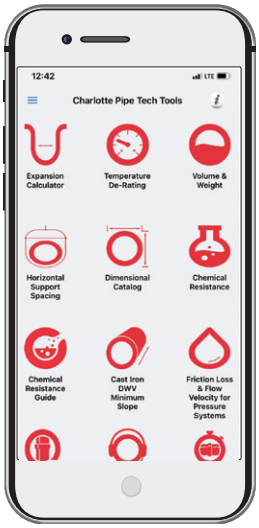
Our experienced customer service associates provide unmatched service, offering a wealth of information on products, orders and processes. We take a team approach to serving your business with flexibility and reliability you can count on.

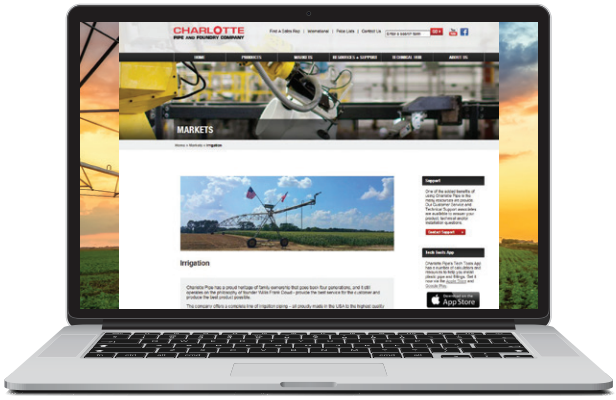
Multiple Locations to Serve You.

Charlotte Pipe has manufacturing facilities across the U.S.

Resources for You.

charlottepipe.com/techtoolsapp. Download it now at the App Store and Google Play or scan our QR code for tools such as our easy friction loss and flow velocity calculator for pressure systems, and more.





Get more information on our products, technical specs and much more at charlottepipe.com/irrigation

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PIPE REFERENCE GUIDE

SIZES AVAILABLE

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PVC SCH. 40 PLAIN END	*	*	*	*	*	*	*	*	*		*	*	*	*	*		*
PVC SCH. 40 WELL CASING						*	*	*	*		*	*	*	*	*		*
PVC SCH. 80 BELL END	*	*	*	*	*	*	*	*	*		*	*	*	*	*		*
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PVC RECLAIMED WATER PIPE SDR 13.5 (PR 315) BELL END	*																
PVC RECLAIMED WATER PIPE SCH 40 BELL END		*	*	*	*	*	*	*	*								
PVC SDR 41 (PR 100) BELL END								*	*	*	*	*	*	*			
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PVC SDR 26 (PR 160) BELL END				*	*	*	*	*	*		*						
PVC SDR 26 (PR 160) GASKETED								*	*		*	*	*				
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PVC 2729 SEWER/DRAIN PIPE BELL END (SOLID WALL)								*	*		*						
PVC 2729 SEWER/DRAIN PIPE BELL END (PERFORATED)								*	*								

DIMENSIONS

PVC SCH 40				
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID	MAX PSI
½"	0.840	0.109	0.622	600 PSI
¾"	1.050	0.113	0.824	480 PSI
1"	1.315	0.133	1.049	450 PSI
1¼"	1.660	0.140	1.380	370 PSI
1½"	1.900	0.145	1.610	330 PSI
2"	2.375	0.154	2.067	280 PSI
2½"	2.875	0.203	2.469	300 PSI
3"	3.500	0.216	3.068	260 PSI
4"	4.500	0.237	4.026	220 PSI
5"	5.563	0.258	5.047	190 PSI
6"	6.625	0.280	6.065	180 PSI
8"	8.625	0.322	7.981	160 PSI
10"	10.750	0.365	10.020	140 PSI
12"	12.750	0.406	11.938	130 PSI
14"	14.000	0.437	13.126	130 PSI
16"	16.000	0.500	15.000	130 PSI

PVC SCH 80				
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID	MAX PSI
½"	0.840	0.147	0.546	850 PSI
¾"	1.050	0.154	0.742	690 PSI
1"	1.315	0.179	0.957	630 PSI
1¼"	1.660	0.191	1.278	520 PSI
1½"	1.900	0.200	1.500	470 PSI
2"	2.375	0.218	1.939	400 PSI
2½"	2.875	0.276	2.323	420 PSI
3"	3.500	0.300	2.900	370 PSI
4"	4.500	0.337	3.826	320 PSI
5"	5.563	0.375	4.813	290 PSI
6"	6.625	0.432	5.761	280 PSI
8"	8.625	0.500	7.625	250 PSI
10"	10.750	0.593	9.564	230 PSI
12"	12.750	0.687	11.376	230 PSI
14"	14.000	0.750	12.500	220 PSI
16	16.000	0.843	14.314	220 PSI

PVC SDR 41 (100 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
3"	3.500	0.085	3.330
4"	4.500	0.110	4.280
5"	5.563	0.136	5.290
6"	6.625	0.162	6.300
8"	8.625	0.210	8.200
10"	10.750	0.262	10.230
12"	12.750	0.311	12.130

DIMENSIONS

PVC SDR 32.5 (125 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
2½"	2.875	0.088	2.700
3"	3.500	0.108	3.280
4"	4.500	0.138	4.224
5"	5.630	0.171	5.221
6"	6.625	0.204	6.217
8"	8.625	0.265	8.095
10"	10.750	0.311	10.088
12"	12.750	0.392	11.966

PVC SDR 26 (160 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
1¼"	1.660	0.064	1.532
1½"	1.900	0.073	1.754
2"	2.375	0.091	2.193
2½"	2.875	0.110	2.655
3"	3.500	0.135	3.230
4"	4.500	0.173	4.154
5"	5.563	0.214	5.135
6"	6.625	0.255	6.115
8"	8.625	0.332	7.961
10"	10.750	0.413	9.924
12"	12.750	0.490	11.770

PVC SDR 21 (200 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
½"*	0.840	0.062	0.716
¾"	1.050	0.060	0.930
1"	1.315	0.063	1.189
1¼"	1.660	0.079	1.502
1½"	1.900	0.090	1.720
2"	2.375	0.113	2.149
2½"	2.875	0.137	2.601
3"	3.500	0.167	3.166
4"	4.500	0.214	4.072
5"	5.563	0.265	5.033
6"	6.625	0.316	5.993
8"	8.625	0.410	7.805
10"	10.750	0.511	9.728
12"	12.750	0.606	11.538

* PR 315/SDR 13.5

DIMENSIONS

PVC PIP SDR 81 (50 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
6"	6.140	0.076	5.988
8"	8.160	0.101	7.958
10"	10.200	0.126	9.948
12"	12.240	0.151	11.938
15"	15.300	0.189	14.922

PVC PIP SDR 51 (80 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
6"	6.140	0.150	5.840
8"	8.160	0.160	7.840
10"	10.200	0.200	9.800
12"	12.240	0.240	11.760
15"	15.300	0.300	14.700

PVC PIP SDR 41 (100 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
6"	6.140	0.150	5.840
8"	8.160	0.199	7.762
10"	10.200	0.249	9.702
12"	12.240	0.299	11.642
15"	15.300	0.373	14.554

PVC PIP SDR 32.5 (125 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
6"	6.140	0.189	5.762
8"	8.160	0.251	7.658
10"	10.200	0.314	9.572
12"	12.240	0.377	11.486
15"	15.300	0.471	14.358

PVC PIP SDR 26 (160 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
15"	15.300	0.588	14.124

PVC PIP SDR 21 (200 PSI)			
PIPE SIZE	AVG. OD.	MIN. WALL	AVG. ID
15"	15.300	0.728	13.844

LOADING CHART

PVC PIP SDR PIPE (WHITE)

PIP SDR 81 (PR 50 PSI) GASKETED

44′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
6″	1,452′	46″	34″	1363 LB	6	16.67%
8″	528′	49″	20″	876 LB	10	10%
10″	**440*/352′**	**44*/44″**	**24″**	**1,140*/912 LB**	**8**	**13.9*/11.2%**
12″	352′	49″	27.5″	1,313 LB	6	16.67%

22′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
15″	132′	59″	33.5″	786 LB	12	8.33%

*** "FIVE-WIDE" SKID DATA (MUST BE PURCHASED TOGETHER)**

PIP SDR 51 (PR 80 PSI) GASKETED

44′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
6″	1,452′	46″	34″	2,133 LB	6	16.67%
8″	528′	49″	20″	1,375 LB	10	10%
10"	**440*/352′**	**51*/44"**	**24"**	**1,793*/1,435 LB**	**8**	**13.9*/11.2%**

22′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
6″	726′	46″	34″	1,081 LB	12	8.33%
8″	264′	49″	20″	698 LB	20	5%
10″	**220*/176′**	**51*/44″**	**24″**	**911*/729 LB**	**16**	**7*/5.75%**
12″	176′	49″	27.5″	1,052 LB	12	8.33%
15″	132′	49″	33.5″	1,239 LB	12	8.33%

*** "FIVE-WIDE" SKID DATA (MUST BE PURCHASED TOGETHER)**

PIP SDR 41 (PR 100 PSI) GASKETED

44′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
6″	1,452′	46″	34″	2,651 LB	6	16.67%
8″	528′	49″	20″	1,701 LB	10	10%
10″	440*/352′	51*/44″	24″	2,220*/1,776 LB	8	13.9*/11.2%

22′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
6″	726′	46″	34″	1,343 LB	12	8.33%
8″	264′	49″	20″	863 LB	20	5%
10″	**220*/176′**	**44″**	**24″**	**1,128*/902 LB**	**16**	**7*/5.75%**
12″	176′	49″	40″	1,303 LB	12	8.33%
15″	132′	49″	33.5″	1,527 LB	12	8.33%

*** "FIVE-WIDE" SKID DATA (MUST BE PURCHASED TOGETHER)**

PIP SDR 32.5 (PR 125 PSI) GASKETED

22′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
6″	726′	46″	34″	1,680 LB	12	8.33%
8″	264′	49″	20″	1,081 LB	20	5%
10″	**220*/176′**	**51*/44″**	**24″**	**1,412*/1,129 LB**	**16**	**7*/5.75%**
12″	176′	49″	27.5″	1,631 LB	12	8.33%
15″	132′	49″	33.5″	1,913 LB	12	8.33%

*** "FIVE-WIDE" SKID DATA (MUST BE PURCHASED TOGETHER)**

PIP SDR 26 (PR 160 PSI) GASKETED

22′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
15″	132′	49″	33.5″	2,369 LB	12	8.33%

PIP SDR 21 (PR 200 PSI) GASKETED

22′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
15″	132′	49″	33.5″	2,904 LB	12	8.33%

LOADING CHART

PVC RECLAIMED WATER PIPE (PURPLE)

SDR 21 (PR 200 PSI) BELL END (RW)

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
¾″	7,000′	42.5″	11″	917 LB	28	3.57%
1″	6,000′	43.25″	15″	1,038 LB	24	4.16%
1¼″	4,000′	46.5″	14.5″	1,040 LB	24	4.16%
1½″	3,300′	49″	14″	1,115 LB	28	3.57%
2″	2,220′	48.5″	14.25″	1,170 LB	28	3.57%
2½″	1,460′	48.5″	14.5″	1,123 LB	28	3.57%
3″	1,000′	47″	14.5″	1,138 LB	28	3.57%
4″	1,340′	49″	29.5″	2,513 LB	12	8.33%
6″	660′	51″	33″	2,643 LB	12	8.33%

SDR 21 (PR 200 PSI) GASKETED (RW)

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
2½″	1,460′	48.5″	14.5″	1,096 LB	28	3.57%
3″	1,000′	47″	14.5″	1,138 LB	28	3.57%
4″	1,340′	49″	29.5″	2,522 LB	12	8.33%
6″	660′	51″	33″	2,757 LB	12	8.33%
8″	280′	47″	26.5″	1,351 LB	16	6.25%
10″	160′	43″	23.5″	1,678 LB	16	6.25%
12″	60′	39.25″	14.75″	885 LB	28	3.57%

SDR 13.5 (PR 315 PSI) BELL END (RW)

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
½″	9,000′	42.5″	9.25″	945 LB	28	3.57%

SCH 40 BELL END (RW)

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
¾″	7,000′	42″	12.5″	1,491 LB	28	3.57%
1″	6,000′	46.5″	15.5″	1,896 LB	24	4.16%
1¼″	4,000′	46.5″	14″	1,716 LB	28	3.57%
1½″	3,300′	49″	14″	1,690 LB	24	4.17%
2″	2,220′	48.5″	14.25″	1,530 LB	28	3.57%
2½″	1,460′	48.5″	14.5″	1,591 LB	28	3.57%
3″	1000′	47″	14.5″	1,425 LB	28	3.57%
4″	1,340′	49″	29.5″	2,775 LB	12	8.33%

LOADING CHART

PVC SDR PRESSURE PIPE (WHITE)

SDR 41 (PR 100 PSI) BELL END

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
3″	1,000′	46″	14.25″	604 LB	28	3.57%
4″	1,340′	49″	29.5″	1,656 LB	12	8.33%
5″	760′	47.75″	26″	1,434 LB	12	8.33%
6″	660′	51″	33″	1,415 LB	12	8.33%
8″	280′	47″	26.5″	1,026 LB	16	6.25%
10″	160′	43″	23.5″	912 LB	16	6.25%
12″	80′	17.75″	26″	1,144 LB	28	3.57%

SDR 41 (PR 100 PSI) GASKETED

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
6″	660′	51″	33″	1,383 LB	12	8.33%
8″	280′	47″	26.5″	990	16	6.25%
10″	160′	43″	23.5″	880 LB	16	6.25%
12″	60′	39.25″	14.75″	465 LB	28	3.57%

SDR 32.5 (PR 125 PSI) BELL END

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
2½″	1,460′	48.5″	14.5″	745 LB	28	3.57%
3″	1,000′	46″	14.25″	756 LB	28	3.57%
4″	1,340′	49″	29.5″	1,656 LB	12	8.33%
5″	760′	47.75″	26″	1,434 LB	12	8.33%
6″	660′	51″	33″	1,767 LB	12	8.33%
8″	280′	47″	26.5″	1,287 LB	16	6.25%
10″	160′	47.75″	26″	1,144 LB	16	6.25%
12″	80′	51″	14.75″	804 LB	28	3.57%

SDR 32.5 (PR 125 PSI) GASKETED

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
6″	660′	51″	33″	1,730 LB	12	8.33%
8″	280′	47″	26.5″	1,241 LB	16	6.25%
10″	160′	43″	23.5″	1,159 LB	16	6.25%
12″	60′	39.25″	14.75″	582 LB	28	3.57%

LOADING CHART

PVC SDR PRESSURE PIPE (WHITE)

SDR 26 (PR 160 PSI) BELL END

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
1¼″	4,000′	46.5″	13.75″	860 LB	24	4.17%
1½″	3,300′	47″	15.5″	921 LB	24	4.16%
2″	2,220′	48.5″	14.25″	957 LB	24	4.17%
2½″	1,460′	48.5″	14.50″	915 LB	28	3.57%
3″	1,000′	47″	14.5″	933 LB	28	3.57%
4″	1,340′	49″	29.5″	2,050 LB	12	8.33%
6″	660′	51″	33″	2,192 LB	12	8.33%

SDR 26 (PR 160 PSI) GASKETED

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
3″	1,000′	47″	14.5″	908 LB	28	3.57%
4″	1,340′	49″	29.5″	2,007 LB	12	8.33%
6″	660′	51″	33″	2,145 LB	12	8.33%
8″	280′	47″	26.5″	1,543 LB	16	6.25%
10″	160′	43″	23.5″	1,367 LB	16	6.25%

SDR 21 (PR 200 PSI) BELL END

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
½″*	9,000′	42.5″	9.25″	945 LB	28	3.57%
¾″	7,000′	42.5″	11″	917 LB	24	4.16%
1″	6,000′	43.25″	15″	1,038 LB	24	4.16%
1¼″	4,000′	43″	14.5″	1,040 LB	24	4.17%
1½″	3,300′	46.5″	15.5″	1,115 LB	28	3.57%
2″	2,220′	48.5″	14.25″	1,170 LB	28	3.57%
2½″	1,460′	48.5″	14.5″	1,123 LB	28	3.57%
3″	1,000′	47″	14.5″	1,138 LB	28	3.57%
4″	1,340′	49″	29.5″	2,513 LB	12	8.33%
6″	660′	51″	33″	2,643 LB	12	8.33%

* PR 315/SDR 13.5

SDR 21 (PR 200 PSI) GASKETED

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
2½″	1,460′	48.5″	14.5″	1,096 LB	28	3.57%
3″	1,000′	47″	14.5″	1,138 LB	28	3.57%
4″	1,340′	49″	29.5″	2,522 LB	12	8.33%
6″	660′	51″	33″	2,757 LB	12	8.33%
8″	280′	47″	26.5″	1,891 LB	16	6.25%
10″	160′	43″	23.5″	1,678 LB	16	6.25%
12″	60′	39.25″	14.75″	885 LB	28	3.57%

LOADING CHART

PVC SCH. 40 PIPE (WHITE)

SCH. 40 BELL END

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
½″	9,000′	42″	11″	1,440 LB	28	3.57%
¾″	7,000′	42″	12.5″	1,491 LB	28	3.57%
1″	6,000′	44.5″	15.5″	1,896 LB	24	4.16%
1¼″	4,000′	46.5″	14″	1,716 LB	24	4.16%
1½″	3,300′	49″	14″	1,690 LB	28	3.57%
2″	2,220′	48.5″	14.25″	1,530 LB	28	3.57%
2½″	1,460′	48.5″	14.5″	1,591 LB	28	3.57%
3″	1,000′	49″	14.5″	1,425 LB	28	3.57%
4″	1,340′	49″	29.5″	2,775 LB	12	8.33%
5″	760′	47.75″	26″	2,071 LB	12	8.33%
6″	660′	51″	33″	2,420 LB	12	8.33%
8″	280′	47″	26.5″	1,570 LB	16	6.25%
10″	160′	43″	23.5″	1,236 LB	16	6.25%
12″	80′	51″	14.75″	817 LB	28	3.57%
14″	60′	41.5″	16.5″	725 LB	24	4.16%
16″	60′	49.5″	18″	948 LB	20	5.00%

SCH. 40 BELL END

10′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
¾″	3,500′	43″	11.5″	746 LB	56	1.78%
1″	3,000′	47″	15.75″	948 LB	44	2.27%

SCH. 40 PLAIN END

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
½″	9,000′	42″	10.5″	1,431 LB	28	3.57%
¾″	7,000′	42″	11.75″	1,484 LB	28	3.57%
1″	6,000′	46″	16″	1,884 LB	24	4.16%
1¼″	4,240′	43.5″	14.5″	1,806 LB	24	4.16%
1½″	3,300′	49″	14.5″	1,680 LB	28	3.57%
2″	2,220′	48.5″	14.25″	1,521 LB	28	3.57%
2½″	1,460′	48.5″	14.75″	1,586 LB	28	3.57%
3″	1,000′	49″	14.5″	1,420 LB	28	3.57%
4″	1,340′	49″	30″	2,711 LB	12	8.33%
6″	660′	51″	33″	2,349 LB	12	8.33%
8″	280′	47″	26.5″	1,579 LB	12	8.33%
10″	220′	46.25″	30.5″	1,683 LB	12	8.33%
12″	80′	51″	14.75″	809 LB	28	3.57%
14″	60′	42″	16″	718 LB	24	4.16%
16″	60′	48.5″	18″	938 LB	20	5.00%

LOADING CHART

PVC SCH. 80 PIPE (GRAY)

SCH. 80 BELL END

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
½″	9,000′	42″	11″	1,836 LB	24	4.16%
¾″	7,000′	42″	12.5″	1,932 LB	24	4.16%
1″	3,540′	43″	9″	1,441 LB	28	3.57%
1¼″	4,240′	45″	15.25″	2,387 LB	28	3.57%
1½″	3,300′	49″	13.5″	2,251 LB	28	3.57%
2″	2,220′	48.5″	14.25″	2,093 LB	28	3.57%
2½″	1,460′	48.5″	14.5″	2,101 LB	28	3.57%
3″	1,000′	49″	14.50″	1,926 LB	28	3.57%
4″	1,140′	49″	26.25″	3,211 LB	12	8.33%
6″	520′	51″	26″	2,794 LB	12	8.33%
8″	280′	48″	26.5″	2,825 LB	12	8.33%
10″	160′	46.5″	23″	1,936 LB	12	8.33%
12″	60′	39.25″	14.75″	999 LB	28	3.57%
14″	60′	43.75″	16″	1,198 LB	24	4.17%
16″	60′	48″	19″	1,540 LB	20	5.00%

SCH. 80 PLAIN END

20′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
½″	9,000′	42″	11″	1,827 LB	24	4.16%
¾″	7,000′	42″	12.5″	1,925 LB	24	4.16%
1″	3,540′	43″	9″	1,437 LB	28	3.57%
1¼″	4,240′	45″	15.25″	2,379 LB	28	3.57%
1½″	3,300′	49″	13.25″	2,244 LB	28	3.57%
2″	2,220′	48.5″	14.25″	2,087 LB	28	3.57%
2½″	1,460′	48.5″	14.5″	2,094 LB	28	3.57%
3″	1,000′	49″	14.50″	1,920 LB	28	3.57%
4″	1,140′	49″	26.25″	3,201 LB	12	8.33%
5″	760′	49.5″	28″	2,959 LB	16	6.25%
6″	520′	51″	26″	2,785 LB	12	8.33%
8″	280′	47″	26.5″	2,278 LB	12	8.33%
10″	160′	43″	24″	1,930 LB	12	8.33%
12″	80′	51″	14.75″	1,328 LB	12	8.33%
14″	60′	42″	15.5″	1,194 LB	24	4.17%
16″	60′	48″	19″	1,535 LB	20	5.00%

SCH. 80 PLAIN END (GRAY or WHITE)

10′ LENGTH						
PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
¾″	4,000′	42.5″	13.50″	1,100 LB	48	2.08%
1″	2,600′	47.5″	11.25″	1,056 LB	44	2.27%

LOADING CHART

PVC SEWER PIPE (NOT FOR PRESSURE) (GREEN)

SDR 35 BELLED END

20′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
4″	1,340′	49″	29.5″	1,365 LB	12	8.33%
6″	660′	51″	33″	1,502 LB	12	8.33%

SDR 35 BELLED END

10′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
4″	670′	49″	29.5″	683 LB	24	4.16%
6″	330′	51″	33″	778 LB	24	4.16%

SDR 35 BELLED END PERFORATED

10′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
4″	670′	49″	29.5″	689 LB	24	4.16%

SDR 35 GASKETED

20′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
4″	1340′	49″	29.5″	1,470 LB	12	8.33%
6″	660′	51″	33″	1,630 LB	12	8.33%

SDR 35 GASKETED

14′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
4″	938′	49″	29.5″	1,036 LB	18	5.56%
6″	462′	51″	33″	1,153 LB	18	5.56%
8″	196′	47″	26.5″	884 LB	24	4.17%

PVC 2729 SEWER & DRAIN PIPE (NOT FOR PRESSURE) (WHITE)

2729 PIPE BELLED END (SOLID WALL)

10′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
3″	1,130′	49″	29″	522 LB	24	4.16%
4″	670′	49″	30″	431 LB	24	4.16%
6″	330′	51″	33″	423 LB	24	4.16%

2729 PIPE BELLED END (PERFORATED)

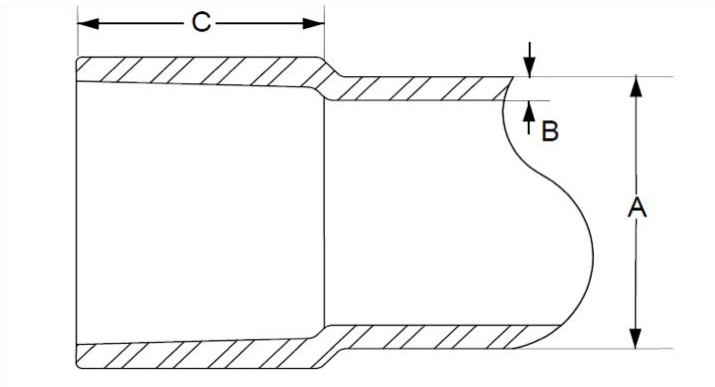
10′ LENGTH

PIPE SIZE	SKID QTY (FT)	WIDTH (IN)	HEIGHT (IN)	GROSS WT (LB)	SKIDS PER TRUCK	TRUCK % PER SKID
3″	1,130′	49″	29″	519 LB	24	4.16%
4″	670′	49″	30″	430 LB	24	4.16%

BELL END DIMENSIONS

BELL END SOLVENT WELD PIPE

PIPE SIZE	MINIMUM WALL THICKNESS (B)				AVERAGE PIPE OD (A)	AVERAGE BELL DEPTH (C)
	SDR 41	SDR 32.5	SDR 26	SDR 21		
¾"	N/A	N/A	N/A	0.060	1.050	1.250
1"	N/A	N/A	N/A	0.063	0.063	1.500
1¼"	N/A	N/A	0.064	0.079	1.660	1.750
1½"	N/A	N/A	0.073	0.09	1.900	2.000
2"	N/A	N/A	0.091	0.113	2.375	2.250
2 ½"	N/A	0.088	0.110	0.137	2.875	2.500
3"	0.085	0.108	0.135	0.167	3.500	3.250
4"	0.110	0.138	0.173	0.214	4.500	4.000
5"	0.136	0.171	N/A	N/A	5.563	4.000
6"	0.162	0.204	0.255	0.316	6.625	6.000
8"	0.210	0.265	0.332	N/A	8.625	6.000
10"	0.262	0.311	0.413	N/A	10.750	7.500
12"	0.311	0.392	0.490	N/A	12.750	8.500

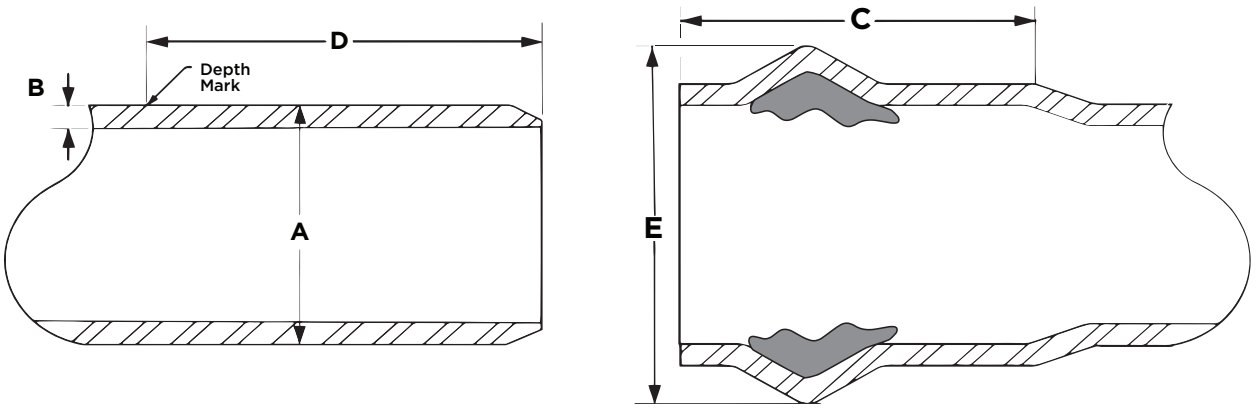


+/- 1/2" Tolerance For (C) Dimension

GASKETED DIMENSIONS

GASKETED PIPE

PIPE SIZE	MINIMUM WALL THICKNESS (B)				AVERAGE PIPE OD (A)	INSERTION MARK (D)	AVERAGE BELL DEPTH (C)	APPROXIMATE BELL OD CLEARANCE (E)
	SDR 41	SDR 32.5	SDR 26	SDR 21				
2½"	N/A	N/A	N/A	0.137	2.875	4.250	5.250	4.375
3"	N/A	N/A	0.135	0.167	3.500	4.500	5.250	4.750
4"	N/A	N/A	0.173	0.214	4.500	4.500	5.500	5.850
6"	0.162	0.204	0.255	0.316	6.625	5.000	6.500	8.500
8"	0.210	0.265	0.332	0.410	8.625	6.000	7.250	10.750
10"	0.262	0.311	0.413	0.511	10.750	7.000	8.250	12.875
12"	0.311	0.392	N/A	0.606	12.750	8.000	9.500	15.875



+/- 1/2" Tolerance For (C) And (D) Dimensions

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC SCH. 40 IPS THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	½" Velocity Feet Per Second	½" Friction Head Feet	½" Friction Loss PSI	¾" Velocity Feet Per Second	¾" Friction Head Feet	¾" Friction Loss PSI	1" Velocity Feet Per Second	1" Friction Head Feet	1" Friction Loss PSI	1¼" Velocity Feet Per Second	1¼" Friction Head Feet	1¼" Friction Loss PSI	1½" Velocity Feet Per Second	1½" Friction Head Feet	1½" Friction Loss PSI	2" Velocity Feet Per Second	2" Friction Head Feet	2" Friction Loss PSI	2½" Velocity Feet Per Second	2½" Friction Head Feet	2½" Friction Loss PSI	3" Velocity Feet Per Second	3" Friction Head Feet	3" Friction Loss PSI
3	3.170	7.580	3.280	2.230	3.210	1.390	1.110	0.600	0.260															
4	4.230	12.910	5.600	2.970	5.470	2.370	1.490	1.020	0.440															
6	8.230	51.570	22.360	4.450	11.590	5.030	2.680	3.360	1.460	1.500	0.820	0.360												
10	10.560	70.450	30.540	7.420	29.860	12.950	3.710	5.540	2.400	2.150	1.460	0.630												
13	13.730	114.530	49.650	9.650	48.540	21.050	4.830	9.010	3.900	2.790	2.370	1.030	2.050	1.120	0.490									
20				14.850	107.800	46.740	7.430	20.000	8.670	4.290	5.270	2.280	3.150	2.490	1.080									
23							8.540	25.910	11.230	4.940	6.820	2.960	3.630	3.220	1.400									
30							11.140	42.380	18.370	6.440	11.160	4.840	4.730	5.270	2.290									
31										6.650	11.860	5.140	4.890	5.600	2.430									
36										7.730	15.640	6.780	5.680	7.390	3.200	3.440	2.190	0.950						
40													6.310	8.980	3.890	3.830	2.660	1.150						
45													7.100	11.170	4.840	4.300	3.310	1.440						
50																4.780	4.030	1.740						
52																4.970	4.330	1.880	3.490	1.820	0.790			
60																5.740	5.640	2.450	4.020	2.380	1.030			
65																6.220	6.540	2.840	4.360	2.760	1.190			
70																6.700	7.510	3.250	4.690	3.160	1.370			
74																			4.960	3.500	1.520			
82																			5.500	4.240	1.840			
85																			5.700	4.530	1.960	3.690	1.570	0.680
90																			6.030	5.040	2.180	3.910	1.750	0.760
95																						4.130	1.930	0.840
100																						4.340	2.130	0.920
115																						4.990	2.760	1.190
130	3.280	0.920	0.400																			5.640	3.460	1.500
135	3.400	0.990	0.430																			5.860	3.710	1.610
140	3.530	1.060	0.460																			6.080	3.970	1.720
150	3.780	1.200	0.520																					
198	4.990	2.010	0.870																					
220	5.550	2.440	1.060																					
225	5.670	2.550	1.100	3.610	0.850	0.370																		
245	6.180	2.980	1.290	3.930	0.990	0.430																		
250				4.010	1.030	0.450																		
275				4.410	1.230	0.530																		
311				4.990	1.540	0.670																		
325				5.210	1.670	0.730																		
340				5.460	1.820	0.790	3.780	0.740	0.320															
350				5.620	1.920	0.830	3.890	0.790	0.340															
370							4.110	0.870	0.380															
400							4.440	1.010	0.440															
450							5.000	1.250	0.540															
480							5.330	1.410	0.610															
500							5.560	1.520	0.660															
535							5.940	1.720	0.750															
550										3.530	0.480	0.210												
600										3.850	0.560	0.240												
650										4.170	0.650	0.280												
700										4.490	0.750	0.320												
779										5.000	0.910	0.390												
800										5.130	0.960	0.410												
820										5.260	1.000	0.430	3.340	0.330	0.140									
850										5.450	1.070	0.460	3.460	0.350	0.150									
900													3.660	0.390	0.170	2.580	0.170	0.070						
1000													4.070	0.480	0.210	2.870	0.200	0.090						
1228													5.000	0.700	0.300	3.520	0.300	0.130	2.910	0.190	0.080			
1500													6.110	1.010	0.440	4.300	0.430	0.190	3.560	0.270	0.120			
1745													7.100	1.340	0.580	5.000	0.570	0.250	4.140	0.360	0.160	3.170	0.190	0.080
1800													7.330	1.420	0.610	5.160	0.600	0.260	4.270	0.380	0.170	3.270	0.200	0.090
2100																6.020	0.800	0.350	4.980	0.510	0.220	3.810	0.260	0.110
2500																7.170	1.110	0.480	5.930	0.700	0.300	4.540	0.370	0.160
2755																			6.400	0.800	0.350	5.000	0.440	0.190
3000																			7.120	0.980	0.430	5.450	0.510	0.220
3500																						6.360	0.680	0.300
4000																						7.270	0.870	0.380

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC SCH. 80 IPS THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	½" Velocity Feet Per Second	½" Friction Head Feet	½" Friction Loss PSI	¾" Velocity Feet Per Second	¾" Friction Head Feet	¾" Friction Loss PSI	1" Velocity Feet Per Second	1" Friction Head Feet	1" Friction Loss PSI	1¼" Velocity Feet Per Second	1¼" Friction Head Feet	1¼" Friction Loss PSI	1½" Velocity Feet Per Second	1½" Friction Head Feet	1½" Friction Loss PSI	2" Velocity Feet Per Second	2" Friction Head Feet	2" Friction Loss PSI	2½" Velocity Feet Per Second	2½" Friction Head Feet	2½" Friction Loss PSI	3" Velocity Feet Per Second	3" Friction Head Feet	3" Friction Loss PSI
1	1.370	1.870	0.810	0.740	0.420	0.180	0.450	0.120	0.050															
3	4.110	14.290	6.190	2.230	3.210	1.390	1.340	0.930	0.400	1¼"														
6	8.230	51.570	22.360	4.450	11.590	5.030	2.680	3.360	1.460	1.500	0.820	0.360												
10	13.710	132.820	57.580	7.420	29.860	12.950	4.460	8.660	3.750	2.500	2.120	0.920	1½"											
11	15.080	158.460	68.700	8.170	35.630	15.450	4.910	10.330	4.480	2.750	2.530	1.100	2.000	1.160	0.500									
15				11.140	62.380	27.430	6.690	18.350	7.950	3.750	4.490	1.950	2.720	2.060	0.890									
20							8.930	31.260	13.550	5.000	7.650	3.320	3.630	3.510	1.520									
25							11.160	47.250	20.490	6.260	11.570	5.010	4.540	5.310	2.300	2"								
27										6.760	13.340	5.780	4.900	6.120	2.650	2.94	1.75	0.76						
36										9.010	22.730	9.850	6.540	10.420	4.520	3.910	2.990	1.300						
40													7.270	12.670	5.490	4.350	3.630	1.580	2½"					
45													8.170	15.760	6.830	4.890	4.520	1.960	3.41	1.88	0.81			
46																5.000	4.710	2.040	3.48	1.95	0.85			
50																5.440	5.490	2.380	3.790	2.280	0.990			
60																6.520	7.700	3.340	4.540	3.200	1.390			
66																7.170	9.190	3.980	5.000	3.810	1.650			
70																			5.300	4.250	1.840			
74																			5.600	4.710	2.040	3"		
82																			6.210	5.700	2.470	3.99	1.94	0.84
85																						4.130	2.070	0.900
90																						4.370	2.300	1.000
95																						4.620	2.540	1.100
102																						4.960	2.900	1.260
115	4"																					5.590	3.620	1.570
130	3.630	1.180	0.510																			6.320	4.550	1.970
135	3.770	1.270	0.550																			6.560	4.880	2.110
140	3.910	1.350	0.590																					
150	4.190	1.540	0.670																					
179	5.000	2.140	0.930																					
220	6.140	3.130	1.360	5"																				
225	6.280	3.260	1.410	3.970	1.070	0.460																		
245	6.840	3.820	1.660	4.320	1.250	0.540																		
250				4.410	1.300	0.560																		
275				4.850	1.550	0.670																		
283				4.990	1.630	0.710																		
325				5.730	2.110	0.910	6"																	
340				6.000	2.290	0.990	4.190	0.960	0.410															
350				6.180	2.420	1.050	4.310	1.010	0.440															
370							4.560	1.120	0.480															
400							4.930	1.290	0.560															
406							5.000	1.330	0.580															
480							5.910	1.810	0.790															
500							6.160	1.950	0.850															
535							6.590	2.210	0.960	8"														
550										3.870	0.600	0.260												
600										4.220	0.700	0.300												
650										4.570	0.810	0.350												
700										4.920	0.930	0.400												
710										4.990	0.960	0.410												
800										5.620	1.190	0.520	10"											
820										5.760	1.250	0.540	3.660	0.410	0.180									
850										5.980	1.330	0.580	3.800	0.440	0.190	12"								
900													4.020	0.490	0.210	2.840	0.210	0.090						
1000													4.470	0.600	0.260	3.160	0.260	0.110	14"					
1120													5.000	0.740	0.320	3.540	0.320	0.140	2.930	0.200	0.090			
1500													6.700	1.270	0.550	4.740	0.550	0.240	3.920	0.340	0.150	16"		
1580													7.060	1.400	0.610	4.990	0.600	0.260	4.130	0.380	0.160	3.150	0.200	0.090
1800													8.040	1.780	0.770	5.680	0.760	0.330	4.710	0.480	0.210	3.590	0.250	0.110
1910																6.030	0.850	0.370	5.000	0.540	0.230	3.810	0.280	0.120
2000																6.320	0.930	0.400	5.230	0.590	0.250	3.990	0.300	0.130
2500																			6.540	0.890	0.390	4.990	0.460	0.200
3000																			0.540	1.250	0.540	5.980	0.640	0.280
3500																						6.980	0.860	0.370
4000																						7.980	1.100	0.480

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC SDR 21 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	¾" Velocity Feet Per Second	¾" Friction Head Feet	¾" Friction Loss PSI	1" Velocity Feet Per Second	1" Friction Head Feet	1" Friction Loss PSI	1¼" Velocity Feet Per Second	1¼" Friction Head Feet	1¼" Friction Loss PSI	1½" Velocity Feet Per Second	1½" Friction Head Feet	1½" Friction Loss PSI	2" Velocity Feet Per Second	2" Friction Head Feet	2" Friction Loss PSI	2½" Velocity Feet Per Second	2½" Friction Head Feet	2½" Friction Loss PSI	3" Velocity Feet Per Second	3" Friction Head Feet	3" Friction Loss PSI
5	2.360	2.760	1.200	1.450	0.830	0.360															
10	4.730	9.950	4.310	2.890	3.010	1.310															
15	7.090	21.090	9.140	4.340	6.380	2.770	2.720	2.050	0.890												
17	8.030	26.590	11.530	4.910	8.050	3.490	3.080	2.580	1.120												
20	9.450	35.930	15.580	5.780	10.870	4.710	3.620	3.490	1.510	2.760	1.800	0.780									
25				7.230	16.430	7.120	4.530	5.270	22.900	3.450	2.730	1.180									
27				7.810	18.950	8.220	4.890	6.080	2.640	3.730	3.140	1.360									
30							5.430	7.390	3.200	4.140	3.820	1.660	2.650	1.290	0.560						
35							6.340	9.830	4.260	4.840	5.080	2.200	3.100	1.720	0.750						
36							6.520	10.360	4.490	4.970	5.360	2.320	3.190	1.810	0.790						
40										5.530	6.510	2.820	3.540	2.200	0.960	2.420	0.870	0.380			
45										6.220	8.100	3.510	3.980	2.740	1.190	2.720	1.080	0.470			
50										6.910	9.840	4.270	4.420	3.330	1.440	3.020	1.320	0.570			
56													4.960	4.110	1.780	3.380	1.620	0.700	2.280	0.620	0.270
60													5.310	4.670	2.020	3.620	1.840	0.800	2.450	0.710	0.310
65													5.750	5.410	2.350	3.930	2.140	0.930	2.650	0.820	0.360
70													6.190	6.210	2.690	4.230	2.450	1.060	2.850	0.940	0.410
75																4.530	2.790	1.210	3.060	1.070	0.460
82																4.950	3.290	1.430	3.340	1.260	0.550
85	2.100	0.400	0.170													5.140	3.520	1.520	3.470	1.350	0.590
90	2.220	0.440	0.190													5.440	3.910	1.690	3.670	1.500	0.650
95	2.340	0.490	0.210													5.740	4.320	1.870	3.870	1.660	0.720
100	2.460	0.540	0.230																4.080	1.830	0.790
122	3.010	0.780	0.340																4.970	2.640	1.140
130	3.200	0.870	0.380	2.100	0.310	0.130													5.300	2.970	1.290
135	3.330	0.940	0.410	2.180	0.330	0.140													5.500	3.180	1.380
140	3.450	1.000	0.430	2.260	0.360	0.150													5.710	3.400	1.480
150	3.700	1.140	0.490	2.420	0.410	0.180															
203	5.000	1.990	0.860	3.280	0.710	0.310	2.310	0.300	0.130												
220	5.420	2.310	1.000	3.550	0.820	0.360	2.500	0.350	0.150												
225	5.550	2.410	1.040	3.630	0.860	0.370	2.560	0.370	0.160												
245	6.040	2.820	1.220	3.950	1.010	0.440	2.790	0.430	0.190												
250				4.030	1.040	0.450	2.840	0.450	0.190												
275				4.440	1.250	0.540	3.130	0.530	0.230												
310				5.000	1.560	0.670	3.530	0.670	0.290	2.080	0.180	0.080									
325				5.240	1.700	0.740	3.700	0.730	0.310	2.180	0.200	0.090									
340				5.490	1.850	0.800	3.870	0.790	0.340	2.280	0.220	0.090									
350				5.650	1.950	0.840	3.980	0.830	0.360	2.350	0.230	0.100									
370							4.210	0.920	0.400	2.480	0.260	0.110									
400							4.550	1.070	0.460	2.680	0.290	0.130									
439							5.000	1.270	0.550	2.950	0.350	0.150									
480							5.460	1.490	0.650	3.220	0.410	0.180	2.070	0.140	0.060						
500							5.690	1.610	0.700	3.350	0.450	0.190	2.160	0.150	0.070						
535							6.090	1.830	0.790	3.590	0.510	0.220	2.310	0.170	0.080						
550										3.690	0.530	0.230	2.380	0.180	0.080						
600										4.030	0.620	0.270	2.590	0.210	0.090						
650										4.360	0.720	0.310	2.810	0.250	0.110	2.000	0.110	0.050			
700										4.700	0.830	0.360	3.020	0.280	0.120	2.150	0.120	0.050			
745										5.000	0.930	0.400	3.220	0.320	0.140	2.290	0.140	0.060			
800										5.370	1.060	0.460	3.460	0.360	0.160	2.460	0.160	0.070			
820										5.500	1.110	0.480	3.540	0.380	0.170	2.520	0.170	0.070			
850										5.700	1.190	0.520	3.670	0.410	0.180	2.610	0.180	0.080			
900													3.890	0.450	0.200	2.760	0.200	0.090			
1000													4.320	0.550	0.240	3.070	0.240	0.100			
1158													5.000	0.720	0.310	3.560	0.320	0.140			
1500													6.480	1.170	0.510	4.610	0.510	0.220			
1630													6.910	1.320	0.570	5.000	0.590	0.250			
1800													7.770	1.640	0.710	5.530	0.710	0.310			
2000																6.140	0.870	0.380			
2500																7.680	1.310	0.570			

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC SDR 26 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	1¼"			1½"			2"			2½"			3"			4"			6"			8"		
	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI
20	3.480	3.170	1.370	2.660	1.640	0.710																		
25	4.350	4.790	2.080	3.320	2.480	1.070																		
28	4.880	5.910	2.560	3.720	3.060	1.330	2.380	1.030	0.450															
30	5.220	6.710	2.910	3.990	3.470	1.510	2.550	1.170	0.510															
35	6.090	8.930	3.870	4.650	4.620	2.000	2.970	1.560	0.680															
37	6.440	9.900	4.290	4.920	5.120	2.220	3.140	1.730	0.750	2.150	0.680	0.300												
40				5.310	5.920	2.570	3.400	2.000	0.870	2.320	0.790	0.340												
45				5.980	7.360	3.190	3.820	2.480	1.080	2.610	0.980	0.420												
50				6.640	8.950	3.880	4.250	3.020	1.310	2.900	1.190	0.520												
55							4.670	3.600	1.560	3.190	1.420	0.620	2.150	0.550	0.240									
60							5.100	4.230	1.830	3.480	1.670	0.720	2.350	0.640	0.280									
65							5.520	4.910	2.130	3.770	1.940	0.840	2.550	0.750	0.320									
70							5.950	5.630	2.440	4.060	2.220	0.960	2.740	0.860	0.370									
75										4.350	2.520	1.090	2.940	0.970	0.420									
80										4.640	2.840	1.230	3.130	1.100	0.470	1.890	0.320	0.140						
85										4.930	3.180	1.380	3.330	1.230	0.530	2.010	0.360	0.160						
90										5.220	3.540	1.530	3.530	1.360	0.590	2.130	0.400	0.170						
95										5.510	3.910	1.690	3.720	1.510	0.650	2.250	0.440	0.190						
100										5.800	4.300	1.860	3.920	1.660	0.720	2.370	0.490	0.210						
125													4.900	2.500	1.090	2.960	0.740	0.320	1.370	0.110	0.050			
130													5.090	2.690	1.170	3.080	0.790	0.340	1.420	0.120	0.050			
135													5.290	2.890	1.250	3.200	0.850	0.370	1.480	0.130	0.060			
140													5.480	3.090	1.340	3.320	0.910	0.390	1.530	0.140	0.060			
150																3.550	1.030	0.450	1.640	0.160	0.070			
200																4.740	1.760	0.760	2.190	0.270	0.120			
215																5.090	2.010	0.870	2.350	0.310	0.130	1.390	0.080	0.040
220																5.210	2.100	0.910	2.400	0.320	0.140	1.420	0.090	0.040
225																5.330	2.190	0.950	2.460	0.330	0.140	1.450	0.090	0.040
245																			2.680	0.390	0.170	1.580	0.110	0.050
250																			2.730	0.400	0.180	1.610	0.110	0.050
275																			3.010	0.480	0.210	1.770	0.130	0.060
300																			3.280	0.570	0.250	1.930	0.160	0.070
325																			3.550	0.660	0.290	2.100	0.180	0.080
340																			3.720	0.720	0.310	2.190	0.200	0.090
350																			3.830	0.760	0.330	2.260	0.210	0.090
370																			4.040	0.840	0.360	2.390	0.230	0.100
375	10"																		4.100	0.860	0.370	2.420	0.240	0.100
400	1.660	0.090	0.040																4.370	0.970	0.420	2.580	0.270	0.120
450	1.870	0.110	0.050																4.920	1.200	0.520	2.900	0.330	0.140
470	1.950	0.120	0.050																5.140	1.300	0.570	3.030	0.360	0.160
480	1.990	0.130	0.060																5.250	1.360	0.590	3.100	0.380	0.160
500	2.070	0.140	0.060																5.470	1.460	0.630	3.220	0.400	0.180
550	2.280	0.170	0.070	12"																		3.550	0.480	0.210
600	2.490	0.190	0.080	1.770	0.080	0.040																3.870	0.570	0.250
650	2.700	0.230	0.100	1.920	0.100	0.040																4.190	0.660	0.290
700	2.900	0.260	0.110	2.070	0.110	0.050																4.510	0.760	0.330
750	3.110	0.290	0.130	2.210	0.130	0.060																4.840	0.860	0.370
800	3.320	0.330	0.140	2.360	0.140	0.060																5.160	0.970	0.420
820	3.400	0.350	0.150	2.420	0.150	0.070																5.290	1.010	0.440
850	3.530	0.370	0.160	2.510	0.160	0.070																5.480	1.080	0.470
900	3.730	0.410	0.180	2.660	0.180	0.080																		
1000	4.150	0.500	0.220	2.950	0.220	0.090																		
1200	4.980	0.700	0.300	3.540	0.310	0.130																		
1300	5.390	0.810	0.350	3.840	0.350	0.150																		
1500	6.220	1.060	0.460	4.430	0.460	0.200																		
1600	6.640	1.190	0.520	4.720	0.520	0.230																		
1650				4.870	0.550	0.240																		
1700				5.020	0.580	0.250																		
1800				5.310	0.650	0.280																		
2000				5.900	0.790	0.340																		

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC SDR 32.5 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	2½"			3"			4"			5"			6"			8"			10"			12"		
	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI
20	1.120	0.200	0.090																					
25	1.400	0.300	0.130	0.950	0.120	0.050																		
30	1.680	0.430	0.180	1.140	0.170	0.070																		
35	1.960	0.570	0.250	1.330	0.220	0.100																		
40	2.240	0.730	0.310	1.520	0.280	0.120																		
45	2.520	0.900	0.390	1.710	0.350	0.150																		
50	2.800	1.100	0.480	1.900	0.430	0.180																		
55	3.080	1.310	0.570	2.090	0.510	0.220	1.260	0.150	0.060															
60	3.360	1.540	0.670	2.280	0.600	0.260	1.370	0.170	0.080															
65	3.640	1.780	0.770	2.470	0.690	0.300	1.490	0.200	0.090															
70	3.920	2.050	0.890	2.660	0.790	0.340	1.600	0.230	0.100															
75	4.200	2.320	1.010	2.850	0.900	0.390	1.720	0.260	0.110															
80	4.490	2.620	1.140	3.040	1.020	0.440	1.830	0.300	0.130															
85	4.770	2.930	1.270	3.230	1.140	0.490	1.950	0.330	0.140	1.270	0.120	0.050												
90	5.050	3.260	1.410	3.420	1.260	0.550	2.060	0.370	0.160	1.350	0.130	0.060												
95	5.330	3.600	1.560	3.610	1.400	0.610	2.180	0.410	0.180	1.420	0.150	0.060												
100	5.610	3.960	1.720	3.800	1.540	0.670	2.290	0.450	0.190	1.500	0.160	0.070												
125				4.750	2.320	1.010	2.860	0.680	0.290	1.870	0.240	0.100												
130				4.940	2.500	1.080	2.980	0.730	0.320	1.950	0.260	0.110												
135				5.130	2.680	1.160	3.090	0.780	0.340	2.020	0.280	0.120	1.430	0.120	0.050									
140				5.320	2.870	1.240	3.210	0.840	0.360	2.100	0.300	0.130	1.480	0.130	0.060									
150				5.700	3.260	1.410	3.440	0.950	0.410	2.250	0.340	0.150	1.590	0.150	0.060									
200							4.580	1.620	0.700	3.000	0.580	0.250	2.110	0.250	0.110									
215							4.920	1.850	0.800	3.220	0.660	0.290	2.270	0.280	0.120									
220							5.040	1.930	0.840	3.300	0.690	0.300	2.330	0.290	0.130									
225							5.150	2.020	0.870	3.370	0.720	0.310	2.380	0.310	0.130									
245							5.610	2.360	1.020	3.670	0.840	0.360	2.590	0.360	0.160	1.530	0.100	0.040						
250										3.750	0.870	0.380	2.640	0.370	0.160	1.560	0.100	0.040						
275										4.120	1.040	0.450	2.910	0.450	0.190	1.720	0.120	0.050						
300										4.500	1.220	0.530	3.170	0.520	0.230	1.870	0.140	0.060						
325										4.870	1.420	0.620	3.440	0.610	0.260	2.030	0.170	0.070						
340										5.100	1.540	0.670	3.600	0.660	0.290	2.120	0.180	0.080						
350										5.250	1.630	0.710	3.700	0.700	0.300	2.180	0.190	0.080	1.410	0.070	0.030			
370										5.550	1.810	0.780	3.910	0.770	0.330	2.310	0.210	0.090	1.490	0.070	0.030			
375													3.970	0.790	0.340	2.340	0.220	0.100	1.510	0.080	0.030			
400													4.230	0.890	0.390	2.490	0.250	0.110	1.610	0.080	0.040			
450													4.760	1.110	0.480	2.810	0.310	0.130	1.810	0.110	0.050			
470													4.970	1.200	0.520	2.930	0.330	0.140	1.890	0.110	0.050			
480													5.080	1.250	0.540	2.990	0.350	0.150	1.930	0.120	0.050	1.370	0.050	0.020
500													5.290	1.350	0.580	3.120	0.370	0.160	2.010	0.130	0.060	1.430	0.060	0.020
535													5.660	1.530	0.660	3.340	0.420	0.180	2.150	0.150	0.060	1.530	0.060	0.030
550																3.430	0.450	0.190	2.210	0.150	0.070	1.570	0.070	0.030
600																3.740	0.520	0.230	2.410	0.180	0.080	1.710	0.080	0.030
650																4.050	0.610	0.260	2.610	0.210	0.090	1.860	0.090	0.040
700																4.370	0.700	0.300	2.810	0.240	0.100	2.000	0.100	0.050
750																4.680	0.790	0.340	3.010	0.270	0.120	2.140	0.120	0.050
800																4.990	0.890	0.390	3.210	0.310	0.130	2.280	0.130	0.060
820																5.110	0.930	0.400	3.290	0.320	0.140	2.340	0.140	0.060
850																5.300	1.000	0.430	3.410	0.340	0.150	2.430	0.150	0.060
900																5.610	1.110	0.480	3.610	0.380	0.160	2.570	0.170	0.070
1000																			4.020	0.460	0.200	2.850	0.200	0.090
1200																			4.820	0.650	0.280	3.430	0.280	0.120
1300																			5.220	0.750	0.330	3.710	0.330	0.140
1500																			6.020	0.980	0.420	4.280	0.430	0.180
1600																			6.430	1.100	0.480	4.570	0.480	0.210
1700																						4.850	0.540	0.230
1800																						5.140	0.600	0.260
2000																						5.710	0.730	0.320
2500																						7.140	1.100	0.480

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC SDR 41 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	3"			4"			5"			6"			8"			10"			12"		
	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI
20	0.740	0.070	0.030																		
25	0.920	0.110	0.050	0.560	0.030	0.010															
30	1.110	0.150	0.070	0.670	0.050	0.020															
35	1.290	0.200	0.090	0.780	0.060	0.030															
40	1.470	0.260	0.110	0.890	0.080	0.030															
45	1.660	0.330	0.140	1.000	0.100	0.040															
50	1.840	0.400	0.170	1.120	0.120	0.050															
55	2.030	0.470	0.200	1.230	0.140	0.060	0.800	0.050	0.020												
60	2.210	0.550	0.240	1.340	0.160	0.070	0.880	0.060	0.030												
65	2.400	0.640	0.280	1.450	0.190	0.080	0.950	0.070	0.030												
70	2.580	0.740	0.320	1.560	0.220	0.090	1.020	0.080	0.030												
75	2.760	0.840	0.360	1.670	0.250	0.110	1.100	0.090	0.040												
80	2.950	0.940	0.410	1.780	0.280	0.120	1.170	0.100	0.040												
85	3.130	1.060	0.460	1.900	0.310	0.140	1.240	0.110	0.050	0.880	0.050	0.020									
90	3.320	1.170	0.510	2.010	0.350	0.150	1.310	0.120	0.050	0.930	0.050	0.020									
95	3.500	1.300	0.530	2.120	0.380	0.170	1.390	0.140	0.060	0.980	0.060	0.030									
100	3.690	1.430	0.620	2.230	0.420	0.180	1.460	0.150	0.070	1.030	0.060	0.030									
125	4.610	2.160	0.940	2.790	0.640	0.280	1.830	0.230	0.100	1.290	0.100	0.040									
130	4.790	2.320	1.010	2.900	0.680	0.300	1.900	0.240	0.110	1.340	0.100	0.050									
135	4.980	2.490	1.080	3.010	0.730	0.320	1.970	0.260	0.110	1.390	0.110	0.050	0.820	0.030	0.010						
140	5.160	2.660	1.150	3.120	0.790	0.340	2.040	0.280	0.120	1.440	0.120	0.050	0.850	0.030	0.010						
150	5.530	3.030	1.310	3.350	0.890	0.390	2.190	0.320	0.140	1.540	0.140	0.060	0.910	0.040	0.020						
200	7.370	5.150	2.230	4.460	1.520	0.660	2.920	0.540	0.240	2.060	0.230	0.100	1.220	0.060	0.030						
220				4.910	1.810	0.790	3.210	0.650	0.280	2.270	0.280	0.280	1.340	0.080	0.030						
225				5.020	1.890	0.820	3.290	0.670	0.290	2.320	0.290	0.120	1.370	0.080	0.030						
245				5.470	2.210	0.960	3.580	0.790	0.340	2.520	0.340	0.150	1.490	0.090	0.040	0.960	0.030	0.010			
250				5.580	2.300	1.000	3.650	0.820	0.360	2.570	0.350	0.150	1.520	0.100	0.040	0.980	0.030	0.010			
275							4.020	0.980	0.420	2.830	0.420	0.180	1.670	0.120	0.050	1.070	0.040	0.020			
300							4.380	1.150	0.500	3.090	0.490	0.210	1.820	0.140	0.060	1.170	0.050	0.020			
325							4.750	1.330	0.580	3.350	0.570	0.250	1.980	0.160	0.070	1.270	0.050	0.020			
340							4.970	1.450	0.630	3.500	0.620	0.270	2.070	0.170	0.070	1.330	0.060	0.030			
350							5.110	1.530	0.660	3.600	0.650	0.280	2.130	0.180	0.080	1.370	0.060	0.030	0.970	0.030	0.010
370							5.400	1.690	0.730	3.810	0.720	0.310	2.250	0.200	0.090	1.440	0.070	0.030	1.030	0.030	0.010
375							5.480	1.740	0.750	3.860	0.740	0.320	2.280	0.210	0.090	1.460	0.070	0.030	1.040	0.030	0.010
400										4.120	0.840	0.360	2.430	0.230	0.100	1.560	0.080	0.030	1.110	0.030	0.010
450										4.630	1.040	0.450	2.740	0.290	0.130	1.760	0.100	0.040	1.250	0.040	0.020
480										4.940	1.170	0.510	2.920	0.330	0.140	1.870	0.110	0.050	1.330	0.050	0.020
500										5.150	1.260	0.550	3.040	0.350	0.150	1.950	0.120	0.050	1.390	0.050	0.020
535										5.510	1.430	0.620	3.250	0.400	0.170	2.090	0.140	0.060	1.490	0.060	0.030
550										5.660	1.510	0.650	3.340	0.420	0.180	2.150	0.140	0.060	1.530	0.060	0.030
600													3.650	0.490	0.210	2.340	0.170	0.070	1.670	0.070	0.030
650													3.950	0.570	0.250	2.540	0.190	0.080	1.810	0.080	0.040
700													4.250	0.650	0.280	2.730	0.220	0.100	1.940	0.100	0.040
750													4.560	0.740	0.320	2.930	0.250	0.110	2.080	0.110	0.050
800													4.860	0.840	0.360	3.120	0.290	0.120	2.220	0.120	0.050
820													4.980	0.880	0.380	3.200	0.300	0.130	2.280	0.130	0.060
850													5.170	0.940	0.410	3.320	0.320	0.140	2.360	0.140	0.060
900													5.470	1.040	0.450	3.510	0.360	0.150	2.500	0.150	0.070
1000													6.080	1.270	0.550	3.910	0.430	0.190	2.780	0.190	0.080
1280																5.000	0.680	0.300	3.560	0.300	0.130
1500																5.860	0.910	0.400	4.170	0.400	0.170
1600																6.250	1.030	0.450	4.440	0.450	0.200
1800																7.030	1.280	0.560	5.000	0.560	0.240
2000																			5.560	0.680	0.290
2500																			6.940	1.030	0.450
3000																			8.330	1.440	0.620

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC PIP SDR 32.5 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	6″			8”			10”			12”			15”		
	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI
175	2.150	0.280	0.120												
200	2.460	0.360	0.160												
250	3.080	0.540	0.230												
300	3.690	0.760	0.330												
350	4.310	1.010	0.440	2.440	0.250	0.110									
405	4.990	1.320	0.570	2.820	0.330	0.140									
415	5.110	1.380	0.600	2.890	0.350	0.150									
470	5.790	1.740	0.750	3.280	0.440	0.190									
500	6.160	1.950	0.850	3.480	0.490	0.210	2.230	0.170	0.070						
550				3.830	0.580	0.250	2.450	0.200	0.090						
600				4.180	0.690	0.300	2.680	0.230	0.100						
650				4.530	0.800	0.340	2.900	0.270	0.120						
700				4.880	0.910	0.400	3.120	0.310	0.130	2.170	0.130	0.060			
718				5.000	0.960	0.410	3.200	0.320	0.140	2.220	0.130	0.060			
800				5.580	1.170	0.510	3.570	0.390	0.170	2.480	0.160	0.070			
820				5.710	1.220	0.530	3.660	0.410	0.180	2.540	0.170	0.070			
850				5.920	1.310	0.570	3.790	0.440	0.190	2.630	0.180	0.080			
900							4.010	0.490	0.210	2.790	0.200	0.090			
1000							4.460	0.600	0.260	3.100	0.250	0.110	1.980	0.080	0.040
1120							5.000	0.740	0.320	3.470	0.300	0.130	2.220	0.100	0.040
1300							5.800	0.970	0.420	4.030	0.400	0.170	2.580	0.130	0.060
1500							6.690	1.260	0.550	4.650	0.520	0.230	2.970	0.180	0.080
1610							7.180	1.440	0.620	4.990	0.590	0.260	3.190	0.200	0.090
1690										5.240	0.650	0.280	3.350	0.220	0.100
1745										5.410	0.690	0.300	3.460	0.230	0.100
1800										5.580	0.730	0.320	3.570	0.250	0.110
2000													3.970	0.300	0.130
2100													4.160	0.330	0.140
2520													5.000	0.460	0.200
3000													5.950	0.630	0.280
3500													6.940	0.840	0.370
4000													7.930	1.080	0.470

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC PIP SDR 41 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	6" Velocity Feet Per Second	6" Friction Head Feet	6" Friction Loss PSI	8" Velocity Feet Per Second	8" Friction Head Feet	8" Friction Loss PSI	10" Velocity Feet Per Second	10" Friction Head Feet	10" Friction Loss PSI	12" Velocity Feet Per Second	12" Friction Head Feet	12" Friction Loss PSI	15" Velocity Feet Per Second	15" Friction Head Feet	15" Friction Loss PSI
175	2.100	0.260	0.110												
200	2.400	0.340	0.150												
250	3.000	0.510	0.220												
300	3.600	0.710	0.310												
350	4.190	0.940	0.410	2.370	0.240	0.100									
400	4.790	1.210	0.520	2.710	0.300	0.130									
416	4.990	1.300	0.560	2.820	0.330	0.140									
470	5.630	1.630	0.710	3.190	0.410	0.180									
500	5.990	1.830	0.790	3.390	0.460	0.200	2.170	0.150	0.070						
550	6.590	2.180	0.950	3.730	0.550	0.240	2.390	0.180	0.080						
600				4.070	0.640	0.280	2.610	0.220	0.090						
650				4.410	0.740	0.320	2.820	0.250	0.110						
700				4.750	0.850	0.370	3.040	0.290	0.130	2.110	0.120	0.050			
735				4.990	0.930	0.410	3.190	0.320	0.140	2.220	0.130	0.060			
800				5.430	1.090	0.470	3.470	0.370	0.160	2.410	0.150	0.070			
820				5.560	1.140	0.500	3.560	0.390	0.170	2.470	0.160	0.070			
850				5.770	1.220	0.530	3.690	0.410	0.180	2.560	0.170	0.070			
900							3.910	0.460	0.200	2.710	0.190	0.080			
1000							4.340	0.560	0.240	3.020	0.230	0.100	1.930	0.080	0.030
1150							4.990	0.720	0.310	3.470	0.300	0.130	2.220	0.100	0.040
1300							5.640	0.910	0.390	3.920	0.370	0.160	2.510	0.130	0.050
1500							6.510	1.180	0.510	4.520	0.490	0.210	2.890	0.160	0.070
1600							6.950	1.330	0.580	4.820	0.550	0.240	3.090	0.190	0.080
1650										4.980	0.580	0.250	3.180	0.200	0.090
1745										5.260	0.650	0.280	3.370	0.220	0.090
1800										5.430	0.680	0.300	3.470	0.230	0.100
2000										6.030	0.830	0.360	3.860	0.280	0.120
2100													4.050	0.310	0.130
2590													5.000	0.450	0.200
3000													5.790	0.590	0.260
3500													6.750	0.790	0.340
4000													7.720	1.010	0.440

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC PIP SDR 51 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	6"			8"			10"			12"			15"		
	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI
175	2.100	0.260	0.110												
200	2.400	0.340	0.150												
250	3.000	0.510	0.220												
300	3.600	0.710	0.310												
350	4.190	0.940	0.410	2.330	0.230	0.100									
400	4.790	1.210	0.520	2.660	0.290	0.130									
415	4.970	1.290	0.560	2.760	0.310	0.130									
470	5.630	1.630	0.710	3.130	0.390	0.170									
500	5.990	1.830	0.790	3.320	0.440	0.190	2.130	0.150	0.060						
550	6.590	2.180	0.950	3.660	0.520	0.230	2.340	0.180	0.080						
600				3.990	0.610	0.270	2.550	0.210	0.090						
650				4.320	0.710	0.310	2.770	0.240	0.100						
700				4.650	0.810	0.350	2.980	0.270	0.120	2.070	0.110	0.050			
750				4.990	0.920	0.400	3.190	0.310	0.140	2.220	0.130	0.060			
800				5.320	1.040	0.450	3.400	0.350	0.150	2.360	0.140	0.060			
820				5.450	1.090	0.470	3.490	0.370	0.160	2.420	0.150	0.070			
850				5.650	1.170	0.510	3.620	0.390	0.170	2.510	0.160	0.070			
900							3.830	0.440	0.190	2.660	0.180	0.080			
1000							4.260	0.530	0.230	2.960	0.220	0.090	1.890	0.070	0.030
1175							5.000	0.720	0.310	3.470	0.300	0.130	2.220	0.100	0.040
1300							5.530	0.860	0.370	3.840	0.360	0.150	2.460	0.120	0.050
1500							6.380	1.130	0.490	4.430	0.460	0.200	2.840	0.160	0.070
1600							6.810	1.270	0.550	4.730	0.520	0.230	3.030	0.180	0.080
1690										4.990	0.580	0.250	3.200	0.200	0.080
1745										5.160	0.610	0.270	3.300	0.210	0.090
1800										5.320	0.650	0.280	3.400	0.220	0.100
2000										5.910	0.790	0.340	3.780	0.270	0.120
2500													4.730	0.400	0.170
2640													4.990	0.450	0.190
3000													5.670	0.570	0.250
3500													6.620	0.750	0.330
4000													7.570	0.960	0.420

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC PIP SDR 81 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	6"			8"			10"			12"			15"		
	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI
175	1.990	0.230	0.100												
200	2.280	0.300	0.130												
250	2.850	0.450	0.190												
300	3.420	0.630	0.270												
350	3.990	0.840	0.360	2.260	0.210	0.090									
400	4.560	1.070	0.460	2.580	0.270	0.120									
439	5.000	1.270	0.550	2.830	0.320	0.140									
470	5.360	1.440	0.630	3.030	0.360	0.160									
500	5.700	1.620	0.700	3.230	0.410	0.180	2.060	0.140	0.060						
550	6.270	1.930	0.840	3.550	0.480	0.210	2.270	0.160	0.070						
600				3.870	0.570	0.250	2.480	0.190	0.080						
650				4.190	0.660	0.290	2.680	0.220	0.100						
700				4.520	0.760	0.330	2.890	0.260	0.110	2.010	0.110	0.050			
775				5.000	0.910	0.400	3.200	0.310	0.130	2.220	0.130	0.060			
800				5.160	0.970	0.420	3.300	0.330	0.140	2.290	0.130	0.060			
820				5.290	1.010	0.440	3.390	0.340	0.150	2.350	0.140	0.060			
850				5.490	1.080	0.470	3.510	0.370	0.160	2.440	0.150	0.070			
900							3.720	0.410	0.180	2.580	0.170	0.070			
1000							4.130	0.490	0.210	2.870	0.200	0.090	1.840	0.070	0.030
1210							5.000	0.700	0.310	3.470	0.290	0.130	2.220	0.100	0.040
1300							5.370	0.800	0.350	3.730	0.330	0.140	2.390	0.110	0.050
1500							6.190	1.050	0.450	4.300	0.430	0.190	2.750	0.150	0.060
1600							6.610	1.180	0.510	4.590	0.490	0.210	2.940	0.160	0.070
1700										4.880	0.540	0.240	3.120	0.180	0.080
1745										5.000	0.570	0.250	3.200	0.190	0.080
1800										5.160	0.600	0.260	3.300	0.200	0.090
2000										5.740	0.730	0.320	3.670	0.250	0.110
2500										7.170	1.110	0.480	4.590	0.380	0.160
2720													4.990	0.440	0.190
3000													5.510	0.530	0.230
3500													6.420	0.700	0.300
4000													7.340	0.900	0.390

FRICTION LOSS AND FLOW VELOCITY CHART

FRICTION LOSS AND FLOW VELOCITY FOR PVC PIP SDR 26 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI
15”			
500	1.020	0.020	0.010
800	1.640	0.060	0.030
1000	2.050	0.090	0.040
1500	3.070	0.190	0.080
2000	4.100	0.320	0.140
2440	5.000	0.470	0.200
2500	5.120	0.490	0.210
3000	6.150	0.690	0.300
3500	7.170	0.910	0.400

FRICTION LOSS AND FLOW VELOCITY FOR PVC PIP SDR 21 THERMOPLASTIC PIPE

(Friction head and friction loss are per 100 feet of pipe.) Notice: Flow velocities should not exceed 5 feet per second, velocities exceeding 5 feet per second may result in failure and property damage

Gallons per Minute	Velocity Feet Per Second	Friction Head Feet	Friction Loss PSI
15”			
500	1.070	0.030	0.010
800	1.710	0.070	0.030
1000	2.130	0.100	0.040
1500	3.200	0.210	0.090
2000	4.270	0.360	0.150
2340	4.990	0.480	0.210
2500	5.330	0.540	0.230
3000	6.400	0.760	0.330
3500	7.460	1.010	0.440

Gasketed Pipe Assembly*

Bar and block is the recommended method of assembly. Small-diameter pipes can be assembled by one worker, while larger diameters may require two people working together.

Besides quicker installation of a pipe line, the major advantage of barring pipe (see Bar & Block illustration below) is that the worker has a feel for the process. This assures proper alignment and assembly.

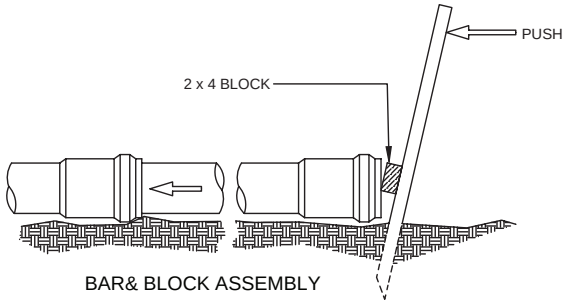
NOTE: Assembly with power equipment is not recommended.

Standard good mechanical assembly practice take alignment into consideration and produces reliable, leak-free pipe lines.

Straight alignment assembly will not dislodge gaskets. Forced, improper alignment insertion produces an insertion curve characterized by the tremendous force necessary to dislodge the gasket from the race, trap it between the bell and spigot surfaces, and stretch it backwards. The insertion force necessary to assemble a joint with dislodged gaskets is so extreme, it can only be accomplished using mechanical equipment without the operator's knowledge of the dislocation.

Joint Insertion Instructions

1. Clean the gasket area. Remove sand, dirt, grease, and debris. Do not remove gaskets from bells.
2. Check the gasket. Make sure it is seated uniformly in the groove by running your finger around the inner edge of the gasket. If the gasket has a plastic retainer ring, make sure it it's properly seated into the rubber portion of the gasket.
3. Clean the spigot. Use a rag to wipe the spigot clean.
4. Lower the pipe into the trench carefully to avoid getting dirt onto the bell or spigot.
5. Lubricate. Apply approved pipe lubricant to the bevel of the spigot end and approximately mid-way back to the reference line. A thin layer of lubricant may be applied to the face of the gasket, but be careful not to get lubricant behind or under the gasket.
6. Keep lubricated areas clean. If dirt or sand adheres to lubricated areas, clean and re-lubricate.
7. Assemble pipe. Insert the spigot end into the pipe until it contacts the gasket uniformly or is a short distance from the gasket. Straight alignment is essential. Apply steady pressure by hand or by mechanical means (bar and block, come-along, hydraulic jack) until the spigot slips through the gasket. Insert pipe until the assembly stop line is flush with the bell end.
8. If undue resistance to pipe insertion is encountered or if the pipe cannot be inserted to the reference mark, disassemble the joint and check the position of the gasket. If the gasket is still properly positioned, verify proper positioning of the reference mark. Relocate the mark if it is not correctly positioned. In general, fittings allow less insertion than do pipe bells.
9. If the pipe must be field-cut, mark the entire circumference to ensure a square cut. Bevel the field cut the same as a factory bevel. If being installed into fittings, follow manufacturer's recommendations. Round off any sharp edges on the leading edge of the bevel with a pocket knife or a file. Mark cut end with an insertion line similar to uncut pipe.



BAR& BLOCK ASSEMBLY

*Data and language courtesy of Hultec

NOTICE

All pipe thread sealants must conform to the requirements of IAPMO's PS 36 and with the thread sealant manufacturer to confirm that these sealants are chemically compatible with ABS, PVC, and CPVC. Incompatible pipe thread sealants may result in the degradation of plastic pipe or fittings resulting in product failure and property damage.

- Verify that paints, thread sealants, lubricants, plasticized PVC products, foam insulations, caulks, leak detectors, insecticides, termiticides, antifreeze solutions, pipe sleeve, firestop materials or other materials are chemically compatible with ABS, PVC or CPVC.
- Do not use edible oils such as Crisco® for lubricant.
- Read and follow chemical manufacturer's literature before using with piping materials.
- Confirm compatibility of pipe marking adhesive tape with the manufacturer of the tape to ensure chemical compatibility with CPVC pipe and fittings.

LIMITED WARRANTY

Charlotte Pipe and Foundry Company® (Charlotte Pipe®) Products are warranted to be free from manufacturing defects and to conform to currently applicable ASTM standards for a period of five (5) years from date of delivery. Buyer's remedy for breach of this warranty is limited to replacement of, or credit for, the defective product. This warranty excludes any expense for removal or reinstallation of any product and any other incidental, consequential, or punitive damages. **This limited warranty is the only warranty made by seller and is expressly in lieu of all other warranties, express and implied, including any warranties of merchantability and fitness for a particular purpose.** No statement, conduct or description by Charlotte Pipe 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 Charlotte Pipe.

This Limited Warranty will not apply if:

1) The Products are used for purposes other than their intended purpose as defined by local plumbing and building codes, and the applicable ASTM standard.
2) The Products are not installed in good and workmanlike manner consistent with normal industry standards; installed in compliance with the latest instructions published by Charlotte Pipe and good plumbing practices; and installed in conformance with all applicable plumbing, fire and building code requirements.
3) This limited warranty does not apply when the products of Charlotte Pipe are used with the products of other manufacturers that do not meet the applicable ASTM or CISPI standards or that are not marked in a manner to indicate the entity that manufactured them.
4) In hubless cast iron installations, this warranty will not apply if products are joined with unshielded hubless couplings. Charlotte Pipe requires that its hubless cast iron pipe and fittings be joined only with shielded hubless couplings manufactured in accordance with CISPI 310, ASTM C 1277 and certified by NSF® International or with Heavy Duty Couplings meeting ASTM C 1540.
5) The Products fail due to defects or deficiencies in design, engineering, or installation of the piping system of which they are a part.
6) The Products have been the subject of modification; misuse; misapplication; improper maintenance or repair; damage caused by the fault or negligence of anyone other than Charlotte Pipe; or any other act or event beyond the control of Charlotte Pipe.
7) The Products fail due to the freezing of water in the Products.
8) The Products fail due to contact with chemical agents, fire stopping materials, thread sealant, plasticized vinyl products, or other aggressive chemical agents that are not compatible.
9) Pipe outlets, sound attenuation systems or other devices are permanently attached to the surface of Charlotte® PVC, ABS or CPVC products with solvent cement or adhesive glue.

Charlotte Pipe products are manufactured to the applicable ASTM or CISPI standard. Charlotte Pipe and Foundry **cannot** accept responsibility for the performance, dimensional accuracy, or compatibility of pipe, fittings, gaskets, or couplings not manufactured or sold by Charlotte Pipe and Foundry.

This Limited Warranty will not apply unless written notice of a claim is mailed to Charlotte Pipe at the address below within 30 days of discovery of the allegedly defective product.

Any Charlotte Pipe products alleged to be defective **must** be made available to Charlotte Pipe at the following address for verification, inspection and determination of cause:

Charlotte Pipe and Foundry Company
Attention: Technical Services
2109 Randolph Road
Charlotte, North Carolina 28207

Purchaser must obtain a return materials authorization and instructions for return shipment to Charlotte Pipe of any product claimed defective or shipped in error.

Any Charlotte Pipe product **proved** to be defective in manufacture will be replaced F.O.B. point of original delivery, or credit will be issued, at the discretion of Charlotte Pipe.

5/19/23

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NOTES

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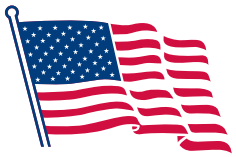

All products manufactured by
Charlotte Pipe and Foundry Company
are proudly made in the U.S.A.