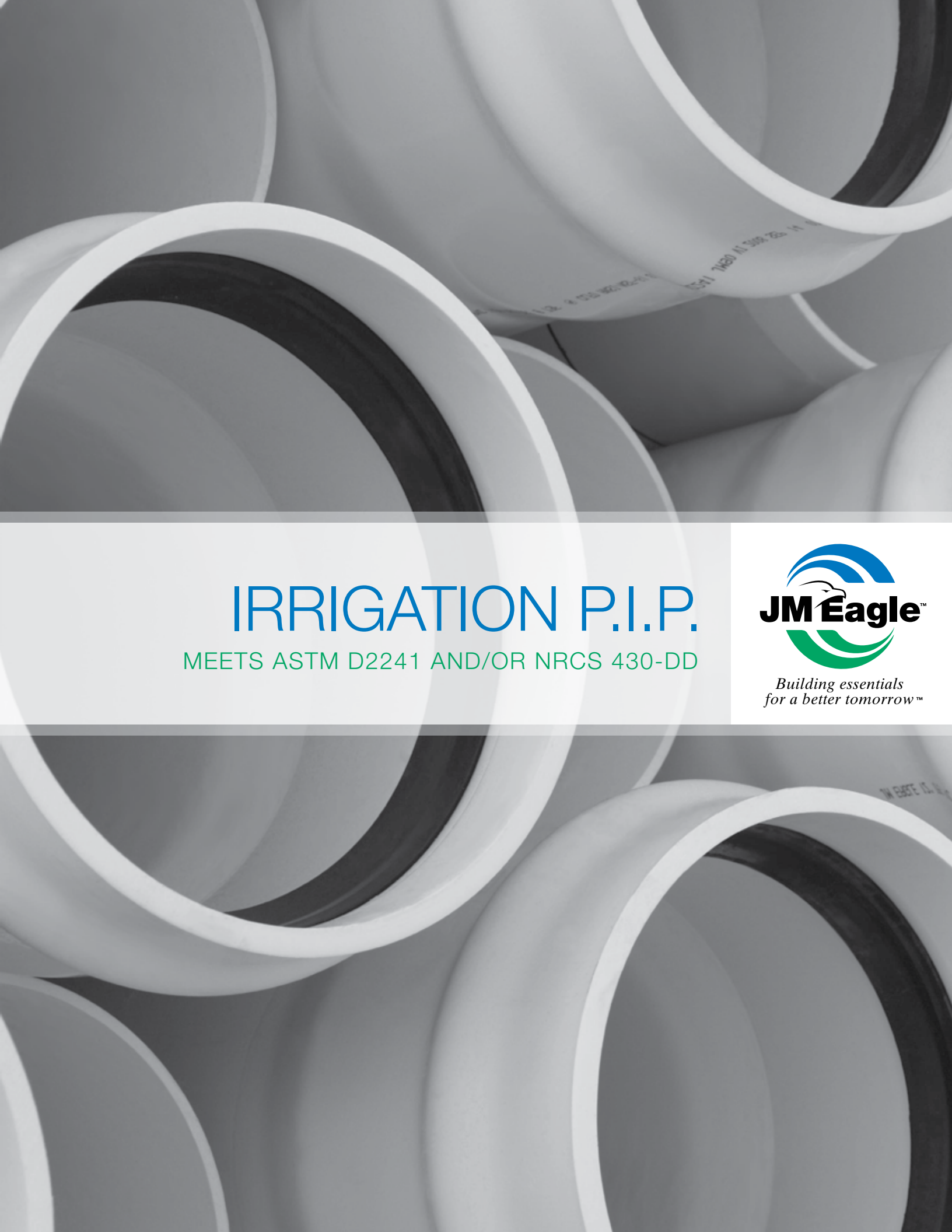
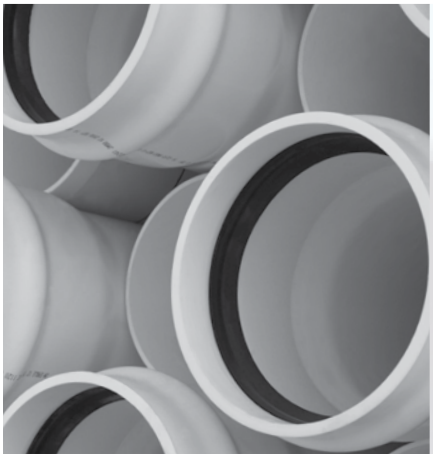


IRRIGATION P.I.P.

MEETS ASTM D2241 AND/OR NRCS 430-DD

JM Eagle™

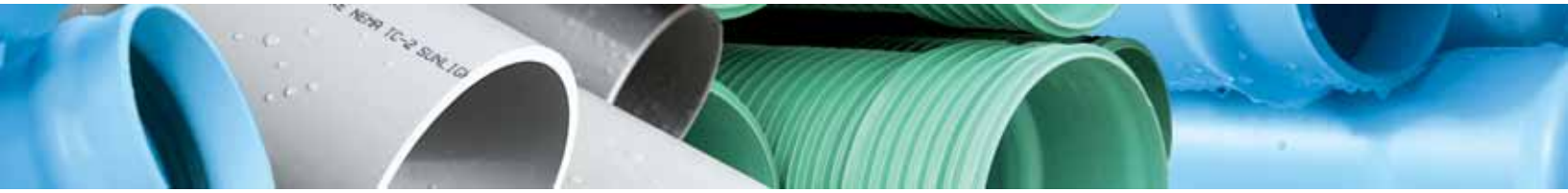
Building essentials for a better tomorrow™



IRRIGATION P.I.P.

PVC P.I.P. Irrigation Pipe
DR 64 / DR 51 / DR 41 / DR 32.5

Pressure Rated 63, 80, 100 and 125 psi
Ring-Tite™ Joints 6" - 27"



IRRIGATION P.I.P.

CONTENTS

01

PRODUCT DESCRIPTION

IRRIGATION ASTM D2241

FOR USE IN IRRIGATION, RURAL WATER SYSTEMS AND OTHER SERVICES

DESCRIPTION

JM Eagle's Irrigation pipe is made in compliance with industry accepted P.I.P. (irrigation) pipe standards. Pipe 6" through 27" in diameter are produced in accordance with the Natural Resources Conservation Service NRCS 430-DD specification and dimensionally comply with Annex A1 of ASTM D2241. Pipes are available in DR 64 (63 psi), DR 51 (80 psi), DR 41 (100 psi), and DR 32.5 (125 psi). PVC compounds used in the extrusion of this pipe meet or exceed the requirements of ASTM D1784 cell class 12454. Joint design is tested to the requirements of ASTM D3139 with rubber gaskets that conform to ASTM F477.

LONG LAYING LENGTHS

The standard laying length of Irrigation PVC pipe is 20 feet. This means that more ground can be covered during installation while eliminating the cost of unnecessary joints.

APPLICATIONS

P.I.P. PVC irrigation pipes can be used for the following:

- Underground pipe mains and laterals for permanent, solid-set sprinkler irrigation systems.
- Underground pipe mains for portable and semi-permanent sprinkler irrigation systems using hand move, drag line, or fixed sprinkler laterals; mechanical move systems such as center pivot, self-propelled sprinkler units, "big gun" sprinklers or tower-mounted sprinkler booms.
- Underground pipe mains for flood, furrow, or drip irrigation systems.
- Underground tail water return (pump back) lines for recovery of water runoff from flood or furrow irrigation systems.

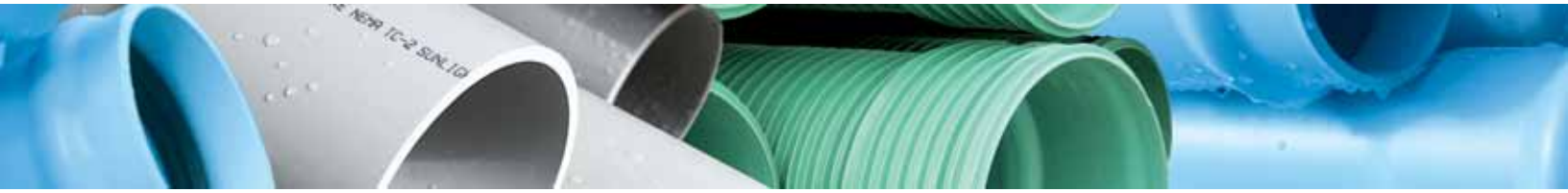
QUALITY CONTROL

This pipe is tested in accordance with the provisions of NRCS 430-DD and subject to inspection by our quality control inspectors throughout its manufacturing process. JM Eagle's Quality Management System is ISO 9001:2000 registered.* Copies of the registration certificates are available on our website at *http://www.jmeagle.com.*

* JM Eagle™ is in the process of obtaining the ISO 9001-2000 registration of Quality Management System for all locations.

CORROSION RESISTANCE

Irrigation PVC pipe 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.



FLOW CAPACITY

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

SAVE IN HANDLING COSTS

JM Eagle™ Irrigation pipe is designed for installion-cost savings. In some instances, 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 cost per foot installed.

FIELD CUTTING AND BEVELING

You can cut Irrigation PVC pipe with a power saw or 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.

LIGHT WEIGHT

A 20 foot length of 100 psi, 8" Irrigation PVC water pipe weighs approximately 66 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 water corrosion or external galvanic soil conditions. The design of the pipe allows for a 2 to 1 long-term safety factor at the marked capacity of the pipe.

INSTALLATION

This product should be installed in accordance with JM Eagle™ Publication JME-06B, "I.P.S. Pressure and Irrigation Pipe Installation Guide" and Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."

PRODUCT DESCRIPTION

(CONTINUED)

P.I.P. O.D.

Available in 6" through 27" diameter sizes, this pipe can be connected directly to most existing irrigation equipment. It can also be connected into I.P.S. cast/ductile iron fittings with the appropriate adapters and/or transition gaskets.

RING-TITE™ JOINTS WITH LOCKED-IN GASKETS

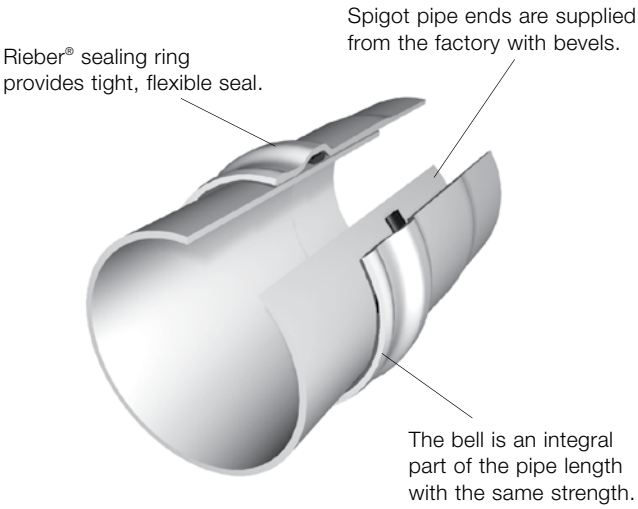
JM Eagle's Ring-Tite™ joint can be assembled quickly. Seated in a deep groove, the flexible elastomeric Rieber®* gasket provides a tight seal that protects the line from shock, vibration, earth movement, and compensates for expansion and contraction of pipe lengths. There's no field mixing or application of cement. It's a simple push together joint that remains tight under normal operating conditions.

The factory installed Rieber® gaskets provide a tight, flexible seal that resists rolling during installation. Special gasket types are available for use with certain chemical and petroleum products. Spigot pipe ends are supplied from the factory with bevels. The bell is an integral part of the pipe length with the same strength. Joints meet or exceed ASTM D3139 for joint tightness, including a 22 in. Hg vacuum for one hour, under deflection with no leakage.

Note: Other types of gaskets may be provided. JM Eagle™ is in the process of converting all gasketed products to the Rieber® ring gasket.

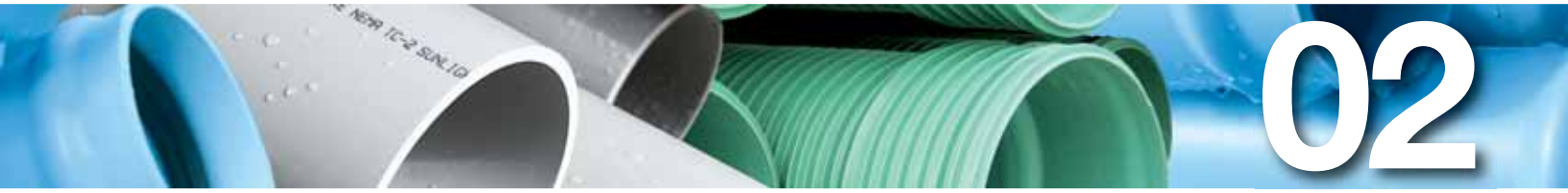
* Rieber® is a registered trademark of TI Specialty Products Inc.

RING-TITE™ JOINT



ACCESSORIES

JM Eagle's Irrigation PVC pipe is compatible with all the items required for smooth installation of agricultural and irrigation pipelines.



02

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 moduli will be greater than the surges in low moduli (PVC) pipe of similar dimensions.

As the modulus of tensile elasticity for a piping material increases, the resultant pressure surge, or “water hammer”, caused by a change in flow velocity also increases. For example, an instantaneous 2 fps (0.6 mps) flow velocity change in an 8" water main 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 8 IN. WATER MAIN

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

PIPE PRODUCT	PRESSURE SURGE	
	psi	kPa
Class 50 DI Pipe	100.0	689
Class 150 AC Pipe	88.7	611
DR 32.5 PVC Pipe	25.6	176

Pressure surges in PVC pipe of different dimension ratios 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. DIMENSION RATIO

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

DIMENSION RATIO	PRESSURE SURGE	
	psi	kPa
13.5	20.2	139
14	19.8	137
17	17.9	123
18	17.4	120
21	16.0	110
25	14.7	101
26	14.4	99
32.5	12.8	88
41	11.4	79
51	10.8	74

03

SHORT FORM SPECIFICATION

IRRIGATION ASTM D2241

SCOPE

This specification designates general requirements for 6" through 27" unplasticized polyvinyl chloride (PVC) plastic irrigation pipe with integral bell and spigot joints for the conveyance of water and other fluids.

MATERIALS

The pipe dimensions shall meet the requirements of NRCS 430-DD and/or ASTM D2241 "Standard Specification for Polyvinyl Chloride (PVC) Pressure Rated Pipe (SDR series), Annex A1. All pipe shall be made from quality PVC resin, compounded to provide physical and mechanical properties that equal or exceed cell class 12454 as defined in ASTM D1784.

STANDARD LAYING LENGTHS

Standard laying lengths shall be 20 feet for all sizes. At least 85% of the total footage of pipe of any class and size shall be furnished in standard lengths. The remaining 15% can be furnished in random lengths.

PIPE

Provisions must be made for expansion and contraction at each joint with an elastomeric gasket. The bell shall consist of an integral wall section with a factory installed, solid cross section Rieber elastomeric gasket which meets the requirements of ASTM F477. The bell section shall be designed to be at least as hydrostatically strong as the pipe barrel and meet the requirements of NRCS 430-DD.

The joint design meets qualification requirements of ASTM D3139, under both pressure and 22 in. Hg vacuum. Sizes and dimensions shall be as shown in this specification.

Pipe installation and usage shall be in compliance with JM Eagle™ Publication JME-06B, "I.P.S. Pressure and Irrigation Pipe Installation Guide" and Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."

QUICK BURST TEST

Randomly selected samples tested in accordance with ASTM D1599 shall withstand, without failure, the pressure listed below when applied in 60-70 seconds.

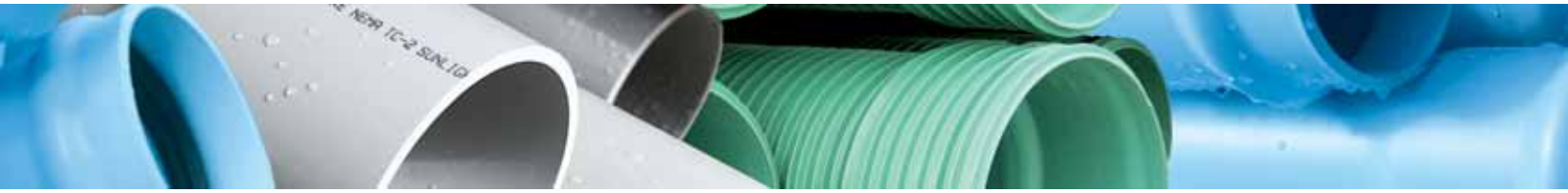
DR	PRESSURE RATING (psi)	MINIMUM BURST PRESSURE AT 73° F (psi)
64	63	200
51	80	260
41	100	315
32.5	125	400

DROP IMPACT TEST

The pipe shall withstand, without failure at 73°F, an impact of a falling missile, Tup B and/or C, at the following levels (Per ASTM D2444).

PIPE SIZE (IN)	IMPACT (FT/LBS)
6	120
8 - 27	160

There shall be no visible evidence of shattering or splitting when the energy is imposed.



TESTING REQUIREMENTS FOR IRRIGATION PVC PRESSURE PIPE

TEST	ASTM D2241/NRCS 430-DD			
	63 psi	80 psi	100 psi	125 psi
SHORT TERM BURST TEST (psi)	200	260	315	400
Extrusion Quality of PVC Pipe by ACETONE IMMERSION TEST Method ASTM D2152	20 min	20 min	20 min	20 min
FLATTENING TEST **Tests extrusion quality and ductility under slow loading conditions (Flattening Capability)**	40% of OD between the plates in 2 - 5 min	40% of OD between the plates in 2 - 5 min	40% of OD between the plates in 2 - 5 min	40% of OD between the plates in 2 - 5 min

TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

PROPERTY	IRRIGATION PVC PIPE	ASTM TEST METHOD
Hoop Stress at 73° F Minimum Short Term Bursting Strength (psi) 1,000 Hour Strength (psi) Min.	6400 4200	D1599 D1598
Working Pressure Rating 73° F (% of rating at 73° F) 80° F (% of rating at 73° F) 100° F (% of rating at 73° F)	100% 88% 62%	
Chemical Resistance at 73°F Acids Salts - Bases Aliphatic Hydrocarbons (including crude oil)	Excellent Excellent Good	
Physical Properties of Compound Std. Test Specimens Minimum Tensile Strength (psi) at 73° F	7000	D638
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	
Mannings N Value	N = 0.009	

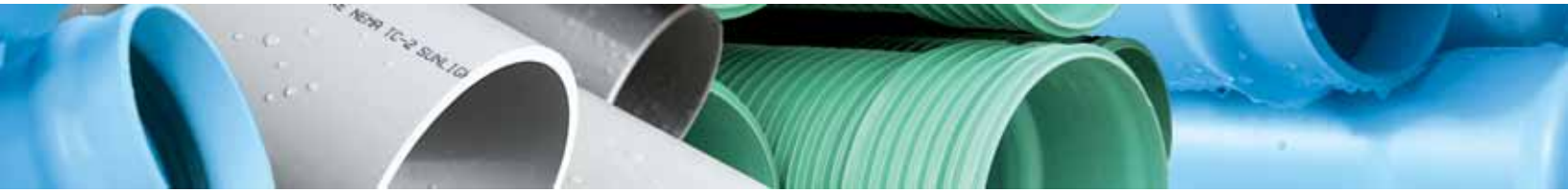
* For data, sizes, or classes not reflected in these charts, please contact JM Eagle™ for assistance.

04

DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

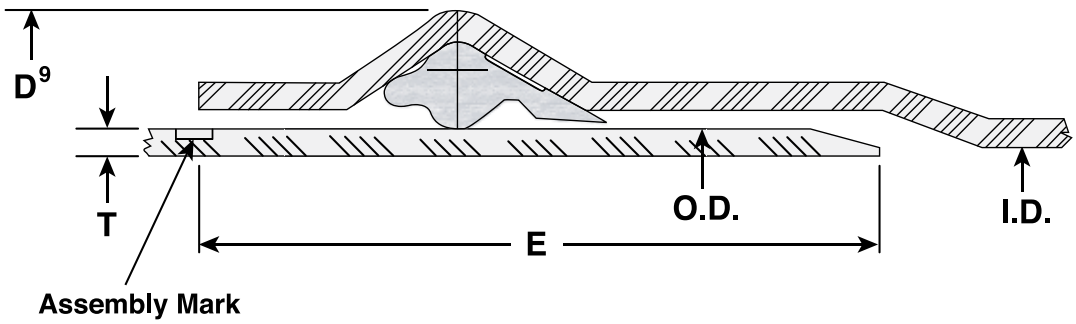
PIPE SIZE (IN)	AVERAGE O.D.** (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D[9] (IN)	APPROX. WEIGHT (LBS/FT)
Rated 63 psi (SDR 64)*						
15	15.300	14.79	0.239	7.25	16.26	7.76
18	18.701	18.08	0.292	9.12	19.87	11.26
Rated 80 psi (SDR 51)*						
6	6.140	5.89	0.120	4.81	6.62	1.52
8	8.160	7.82	0.160	5.52	8.80	2.69
10	10.200	9.78	0.200	6.64	11.00	4.21
12	12.240	11.73	0.240	7.02	13.20	6.08
15	15.300	14.66	0.300	7.25	16.50	9.56
18	18.701	17.92	0.366	8.00	20.17	14.69
21	22.047	21.13	0.432	9.50	23.78	20.45
24	24.803	23.77	0.486	9.60	26.75	26.32
27	27.953	26.79	0.548	10.10	30.15	33.88
Rated 100 psi (SDR 41)*						
6	6.140	5.82	0.150	4.81	6.74	1.88
8	8.160	7.74	0.199	5.52	8.96	3.23
10	10.200	9.67	0.249	6.64	11.20	5.22
12	12.240	11.61	0.299	7.02	13.44	7.54
15	15.300	14.51	0.373	7.25	16.79	11.84
18	18.701	17.73	0.456	8.00	20.52	17.92
21	22.047	20.91	0.538	9.50	24.20	24.99
24	24.803	23.52	0.605	9.60	27.22	32.68
27	27.953	26.51	0.682	10.10	30.69	42.12



PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D^9 (IN)	APPROX WEIGHT (LBS/FT)
Rated 125 psi (SDR 32.5)*						
6	6.140	5.74	0.189	4.81	6.90	2.40
8	8.160	7.63	0.251	5.52	9.16	4.16
10	10.200	9.53	0.314	6.64	11.46	6.53
12	12.240	11.44	0.377	7.02	13.75	9.43
15	15.300	14.30	0.471	7.25	17.18	14.86
18	18.701	17.48	0.575	8.00	21.00	22.27
21	22.047	20.61	0.678	9.50	24.76	31.03
24	24.803	23.19	0.763	9.60	27.86	41.06
27	27.593	26.12	0.860	10.10	31.41	51.41

* Prior to ordering or specifying, please consult JM Eagle™ for product and/or listing availablity.

** O.D. dimensions conform to plastic irrigation pipe (P.I.P.) sizes.



I.D. : Inside Diameter

O.D. : Outside Diameter

T. : Wall Thickness

D^9 : Bell Outside Diameter

E : Distance between Assembly Mark to the end of spigot.

05

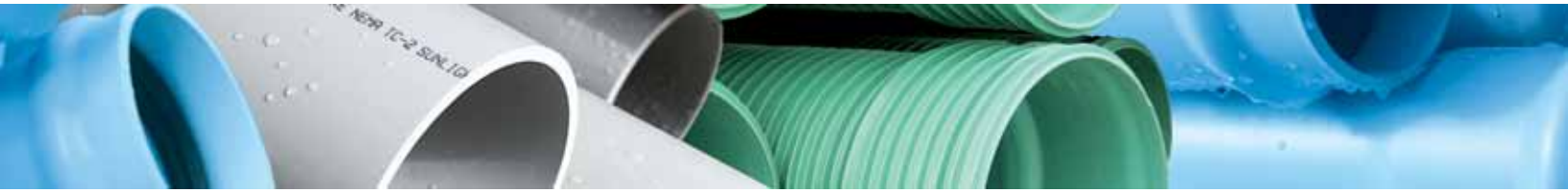
FLOW/FRICTION CHARTS

FLOW/FRICTION LOSS, P.I.P. PVC PIPE

6" P.I.P. (NRCS 430 - DD) Actual O.D. 6.140 INCH

FLOW (GAL/MIN)	DR 64 (63 psi)		DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
50	0.498	0.007	0.591	0.011	0.604	0.011	0.621	0.012
100	0.996	0.026	1.183	0.039	1.207	0.041	1.241	0.044
150	1.495	0.055	1.774	0.082	1.811	0.087	1.862	0.093
200	1.993	0.094	2.365	0.140	2.414	0.148	2.482	0.158
250	2.491	0.142	2.956	0.212	3.018	0.223	3.103	0.239
300	2.989	0.199	3.548	0.298	3.621	0.313	3.724	0.335
400	3.986	0.338	4.730	0.507	4.828	0.533	4.965	0.570
500	4.982	0.511	5.913	0.767	6.035	0.806	6.206	0.861
600	5.979	0.717	7.095	1.075	7.242	1.130	7.447	1.206
700	6.975	0.954	8.278	1.430	8.449	1.503	8.689	1.604
800	7.971	1.221	9.460	1.831	9.657	1.924	9.930	2.054
900	8.968	1.519	10.643	2.277	10.864	2.393	11.171	2.554
1000	9.964	1.846	11.826	2.767	12.071	2.909	12.412	3.104
1100	10.961	2.203	13.008	3.302	13.278	3.471	13.654	3.702

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”



FLOW/FRICTION LOSS, P.I.P. PVC PIPE

8" P.I.P. (NRCS 430 - DD) Actual O.D. 8.160 INCH

FLOW (GAL/ MIN)	DR 64 (63 psi)		DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
100	0.588	0.007	0.669	0.010	0.683	0.010	0.703	0.011
200	1.176	0.026	1.337	0.035	1.366	0.037	1.405	0.040
250	1.469	0.039	1.671	0.053	1.707	0.056	1.757	0.060
300	1.763	0.055	2.006	0.074	2.049	0.078	2.108	0.084
350	2.057	0.073	2.340	0.099	2.390	0.104	2.459	0.112
400	2.351	0.094	2.674	0.127	2.731	0.133	2.811	0.143
450	2.645	0.117	3.009	0.158	3.073	0.166	3.162	0.178
500	2.939	0.142	3.343	0.191	3.414	0.202	3.513	0.216
600	3.527	0.199	4.012	0.268	4.097	0.282	4.216	0.303
800	4.702	0.339	5.349	0.457	5.463	0.481	5.622	0.515
1000	5.878	0.512	6.686	0.691	6.828	0.728	7.027	0.779
1200	7.053	0.718	8.023	0.969	8.194	1.020	8.432	1.091
1400	8.229	0.955	9.360	1.289	9.560	1.357	9.838	1.451
1600	9.404	1.223	10.698	1.651	10.925	1.737	11.243	1.858
2000	11.755	1.848	13.372	2.495	13.657	2.626	14.054	2.808
2200	12.931	2.205	14.709	2.977	15.023	3.133	15.459	3.349

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”

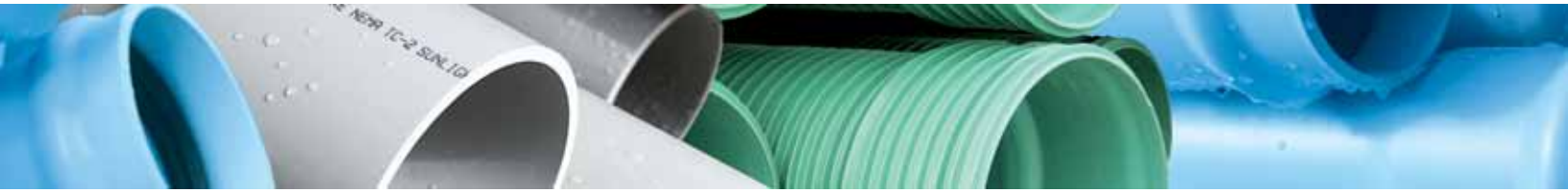
FLOW/FRICTION CHARTS
(CONTINUED)

FLOW/FRICTION LOSS, P.I.P. PVC PIPE

10" P.I.P. (NRCS 430 - DD) Actual O.D. 10.200 INCH

FLOW (GAL/MIN)	DR 64 (63 psi)		DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
200	0.757	0.009	0.856	0.012	0.874	0.012	0.900	0.013
300	1.135	0.019	1.283	0.025	1.311	0.026	1.349	0.028
400	1.513	0.032	1.711	0.043	1.748	0.045	1.799	0.047
500	1.892	0.049	2.139	0.065	2.185	0.068	2.249	0.071
600	2.270	0.068	2.567	0.091	2.622	0.095	2.699	0.100
700	2.648	0.091	2.995	0.120	3.059	0.127	3.148	0.133
800	3.027	0.116	3.423	0.154	3.497	0.163	3.598	0.170
900	3.405	0.144	3.850	0.192	3.934	0.202	4.048	0.212
1000	3.783	0.176	4.278	0.233	4.371	0.246	4.498	0.257
1100	4.162	0.209	4.706	0.278	4.808	0.293	4.948	0.307
1400	5.297	0.327	5.989	0.435	6.119	0.458	6.297	0.479
1700	6.431	0.469	7.273	0.623	7.430	0.657	7.646	0.686
2000	7.566	0.634	8.556	0.842	8.741	0.887	8.996	0.927
2300	8.701	0.821	9.840	1.091	10.052	1.149	10.345	1.201
2600	9.836	1.030	11.123	1.369	11.364	1.442	11.694	1.507
2900	10.971	1.261	12.407	1.676	12.675	1.765	13.044	1.844
3200	12.106	1.513	13.690	2.011	13.986	2.118	14.393	2.212
3500	13.241	1.786	14.973	2.374	15.297	2.501	15.742	2.611

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”



FLOW/FRICTION LOSS, P.I.P. PVC PIPE

12" P.I.P. (NRCS 430 -DD) Actual O.D. 12.240 INCH

FLOW (GAL/MIN)	DR 64 (63 psi)		DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
300	0.807	0.008	0.891	0.010	0.911	0.011	0.937	0.012
400	1.076	0.014	1.188	0.018	1.214	0.019	1.249	0.020
500	1.345	0.021	1.486	0.027	1.518	0.028	1.562	0.030
600	1.614	0.030	1.783	0.037	1.821	0.039	1.874	0.042
700	1.882	0.040	2.080	0.050	2.125	0.052	2.187	0.056
800	2.151	0.051	2.377	0.064	2.428	0.067	2.499	0.072
900	2.420	0.063	2.674	0.079	2.732	0.083	2.811	0.089
1200	3.227	0.107	3.565	0.135	3.642	0.142	3.748	0.152
1500	4.034	0.162	4.457	0.204	4.553	0.214	4.686	0.230
1800	5.254	0.278	5.348	0.285	5.464	0.301	5.623	0.322
2100	6.130	0.369	6.239	0.380	6.374	0.400	6.560	0.429
2400	7.005	0.473	7.130	0.486	7.285	0.512	7.497	0.549
2700	7.881	0.588	8.022	0.605	8.196	0.637	8.434	0.682
3000	8.757	0.715	8.913	0.735	9.106	0.774	9.371	0.829
3300	9.633	0.853	9.804	0.877	10.017	0.924	10.308	0.989
3600	10.508	1.002	10.696	1.030	10.927	1.085	11.245	1.161
3900	11.384	1.162	11.587	1.195	11.838	1.259	12.182	1.347
4200	12.260	1.333	12.478	1.371	12.749	1.444	13.1196	1.545

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”

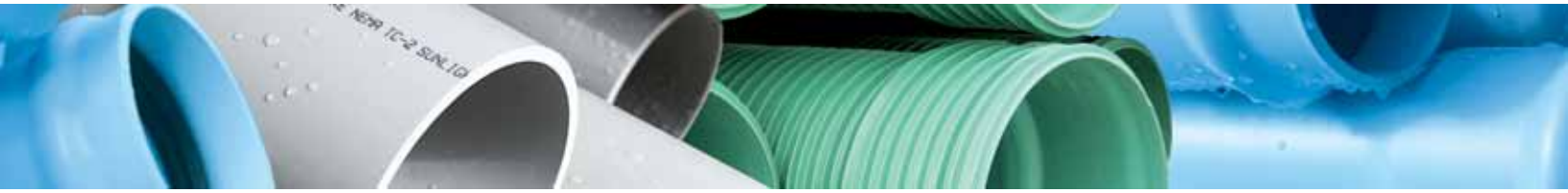
FLOW/FRICTION CHARTS
(CONTINUED)

FLOW/FRICTION LOSS, P.I.P. PVC PIPE

15" P.I.P. (NRCS 430 - DD) Actual O.D. 15.300 INCH

FLOW (GAL/MIN)	DR 64 (63 psi)		DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
700	1.307	0.016	1.332	0.017	1.361	0.018	1.399	0.019
900	1.681	0.026	1.713	0.027	1.750	0.028	1.799	0.030
1100	2.054	0.038	2.093	0.039	2.139	0.041	2.199	0.044
1300	2.428	0.051	2.474	0.053	2.527	0.056	2.599	0.060
1500	2.801	0.067	2.854	0.069	2.916	0.073	2.999	0.078
1700	3.175	0.084	3.235	0.087	3.305	0.091	3.398	0.098
1900	3.548	0.104	3.616	0.107	3.694	0.112	3.798	0.120
2100	3.922	0.125	3.996	0.128	4.083	0.135	4.198	0.145
2300	4.295	0.148	4.377	0.152	4.471	0.160	4.598	0.171
2500	4.669	0.172	4.757	0.177	4.860	0.187	4.998	0.200
2700	5.043	0.199	5.138	0.205	5.249	0.215	5.397	0.231
2900	5.416	0.227	5.519	0.234	5.638	0.246	5.797	0.263
3000	5.603	0.242	5.709	0.249	5.832	0.262	5.997	0.280
3500	6.537	0.321	6.660	0.331	6.804	0.348	6.997	0.373
4000	7.470	0.411	7.612	0.424	7.776	0.446	7.996	0.477
4500	8.404	0.512	8.563	0.527	8.749	0.555	8.996	0.593
5000	9.338	0.622	9.515	0.640	9.721	0.675	9.995	0.721
5500	10.272	0.742	10.466	0.764	10.693	0.805	10.995	0.860

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”



FLOW/FRICTION LOSS, P.I.P. PVC PIPE

18" P.I.P. (ASTM D2241) Actual O.D. 18.701 INCH

FLOW (GAL/MIN)	DR 64 (63 psi)		DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
1100	1.541	0.019	1.401	0.015	1.432	0.015	1.472	0.017
1400	1.961	0.029	1.783	0.023	1.822	0.024	1.873	0.026
1700	2.381	0.042	2.165	0.033	2.212	0.034	2.274	0.037
2000	2.801	0.057	2.547	0.044	2.603	0.047	2.676	0.050
2300	3.222	0.073	2.929	0.057	2.993	0.060	3.077	0.065
2600	3.642	0.092	3.311	0.072	3.384	0.076	3.478	0.081
2900	4.062	0.113	3.693	0.088	3.774	0.093	3.880	0.099
3200	4.482	0.135	4.075	0.105	4.164	0.111	4.281	0.119
3500	4.902	0.160	4.457	0.125	4.555	0.131	4.682	0.140
4000	5.603	0.205	5.094	0.159	5.206	0.168	5.351	0.180
4500	6.303	0.254	5.731	0.198	5.856	0.209	6.020	0.224
5000	7.003	0.309	6.367	0.241	6.507	0.254	6.689	0.272
5500	7.704	0.369	7.004	0.288	7.158	0.303	7.358	0.324
6000	8.404	0.433	7.641	0.338	7.808	0.356	8.027	0.381
6500	9.104	0.503	8.278	0.392	8.459	0.413	8.696	0.441
7000	9.805	0.577	8.914	0.449	9.110	0.474	9.365	0.506
7500	10.505	0.655	9.551	0.511	9.760	0.538	10.034	0.575
8000	11.205	0.738	10.188	0.576	10.411	0.607	10.702	0.648

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”

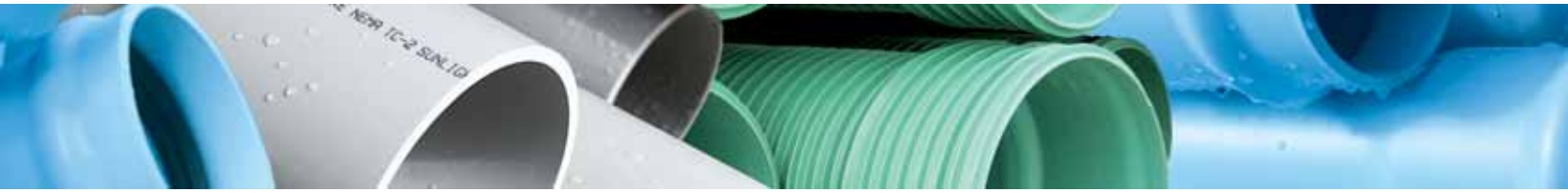
FLOW/FRICTION CHARTS
(CONTINUED)

FLOW/FRICTION LOSS, P.I.P. PVC PIPE

21" P.I.P. (ASTM D2241) Actual O.D. 22.047 INCH

FLOW (GAL/MIN)	DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
1200	1.100	0.008	1.124	0.008	1.605	0.019
1700	1.558	0.015	1.592	0.015	2.274	0.037
2200	2.016	0.024	2.060	0.025	2.943	0.059
2700	2.474	0.035	2.528	0.036	3.612	0.087
3200	2.932	0.047	2.996	0.050	4.281	0.119
3700	3.391	0.062	3.465	0.065	4.950	0.156
4200	3.849	0.078	3.933	0.083	5.619	0.197
5000	4.582	0.108	4.682	0.114	6.689	0.272
6000	5.498	0.152	5.618	0.160	8.027	0.381
7000	6.415	0.202	6.555	0.213	9.365	0.506
8000	7.331	0.258	7.491	0.272	10.702	0.648
9000	8.247	0.321	8.427	0.339	12.040	0.806
10000	9.164	0.391	9.364	0.412	13.378	0.979
11000	10.080	0.466	10.300	0.491	14.716	1.168
12000	10.996	0.548	11.237	0.577	16.054	1.372
13000	11.913	0.635	12.173	0.669	17.392	1.591

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”



FLOW/FRICTION LOSS, P.I.P. PVC PIPE

24" P.I.P. (ASTM D2241) Actual O.D. 24.803 INCH

FLOW (GAL/MIN)	DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
2000	1.448	0.011	1.480	0.012	1.521	0.013
2500	1.810	0.017	1.850	0.018	1.902	0.019
3000	2.172	0.024	2.220	0.025	2.282	0.027
3500	2.534	0.032	2.589	0.033	2.662	0.036
4000	2.896	0.040	2.959	0.043	3.042	0.046
4500	3.258	0.050	3.329	0.053	3.423	0.057
5000	3.620	0.061	3.699	0.064	3.803	0.069
5500	3.982	0.073	4.069	0.077	4.183	0.082
6000	4.344	0.086	4.439	0.090	4.564	0.096
7000	5.068	0.114	5.179	0.120	5.324	0.128
8000	5.792	0.146	5.919	0.154	6.085	0.164
9000	6.517	0.181	6.659	0.191	6.846	0.204
10000	7.241	0.220	7.399	0.232	7.606	0.248
11000	7.965	0.263	8.138	0.277	8.367	0.296
12000	8.689	0.309	8.878	0.325	9.127	0.348
13000	9.413	0.358	9.618	0.377	9.888	0.404
14000	10.137	0.411	10.358	0.433	10.649	0.463
15000	10.861	0.467	11.098	0.492	11.409	0.526

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”

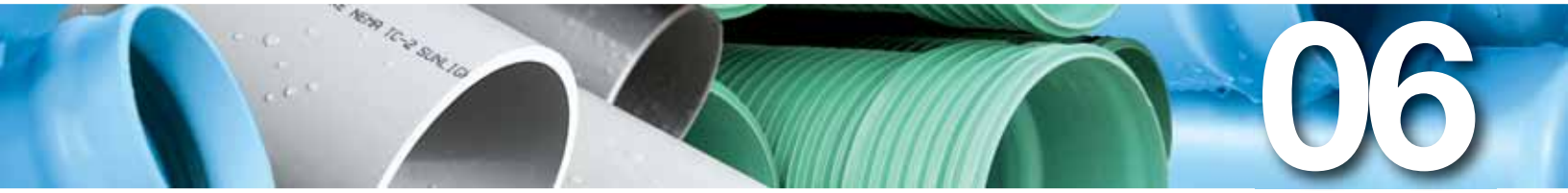
FLOW/FRICTION CHARTS
(CONTINUED)

FLOW/FRICTION LOSS, P.I.P. PVC PIPE

27" P.I.P. (ASTM D2241) Actual O.D. 27.953 INCH

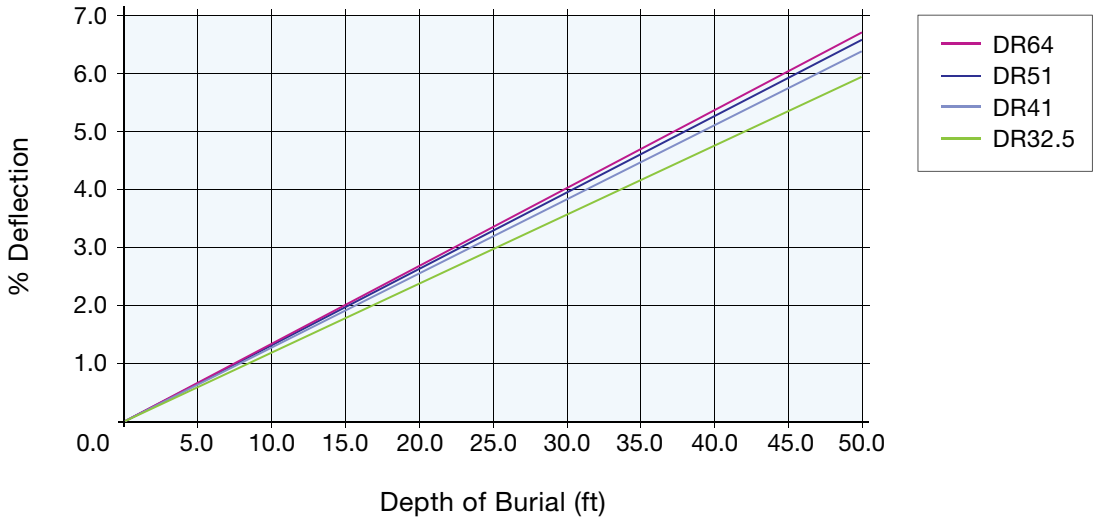
FLOW (GAL/MIN)	DR 51 (80 psi)		DR 41 (100 psi)		DR 32.5 (125 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
2000	1.140	0.006	1.165	0.007	1.198	0.007
2500	1.425	0.009	1.456	0.010	1.497	0.011
3000	1.710	0.013	1.747	0.014	1.796	0.015
3500	1.995	0.018	2.039	0.019	2.096	0.020
4000	2.280	0.023	2.330	0.024	2.395	0.025
4500	2.565	0.028	2.621	0.030	2.695	0.032
5000	2.851	0.034	2.912	0.036	2.994	0.038
5500	3.136	0.041	3.204	0.043	3.294	0.046
6000	3.421	0.048	3.495	0.050	3.593	0.054
7000	3.991	0.064	4.077	0.067	4.192	0.072
8000	4.561	0.081	4.660	0.086	4.791	0.092
9000	5.131	0.101	5.242	0.107	5.389	0.114
10000	5.701	0.123	5.825	0.130	5.988	0.139
11000	6.271	0.147	6.407	0.155	6.587	0.166
12000	6.841	0.173	6.990	0.182	7.186	0.195
13000	7.411	0.200	7.572	0.211	7.785	0.226
14000	7.981	0.230	8.155	0.242	8.384	0.259
15000	8.552	0.261	8.737	0.275	8.982	0.294

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”



DEFLECTION CHART

IRRIGATION DEFLECTION BY DEPTH OF BURIAL : : †



: : Deflections computed using a unit weight of backfill at 120 lbs/cft and assume no internal pressure or live load.
: : Pipe embedment used in calculations is Class 1, 2, 3, or 4, as defined in ASTM D2321 with appropriate compaction to achieve an E'=1000 psi.
† Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, “Handbook of PVC Pipe Design and Construction.”

07

SHORT FORM INSTALLATION GUIDE/ WARNING

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

1. Check to see that the gasket is properly seated in the bell groove, and that the bell and spigot are clean before assembly.
2. Apply the approved lubricant supplied with the pipe to the spigot end of the pipe, paying particular attention to the bevel. The coating should be equivalent to a brush coat of enamel paint.
3. Assemble the joint only to and not over the assembly mark provided on the spigot end.
4. If undue resistance to insertion of the spigot is encountered, or the reference mark does not reach the flush position, disassemble the joint, check the position of the rubber gasket, and remove any debris.
5. JM Eagle's recommendation for 15" through 27" diameter Irrigation P.I.P. is that the angular deflection at the joint is a maximum of 1.5 degrees. This produces an offset in a 20' section of approximately 6¼ inches. Joint deflection is achieved after the joint is assembled in straight alignment and to the reference mark.
6. 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 leakage. For bending of pipe larger than 12", please contact JM Eagle™.

PIPE SIZE (IN)	RADIUS (FT)
6	150
8	200
10	250
12	300

7. Prior to backfilling, check to see that the assembly mark is flush with the end of the bell.
8. All taps performed on JM Eagle's pressure products, shall be in accordance with Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."

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.

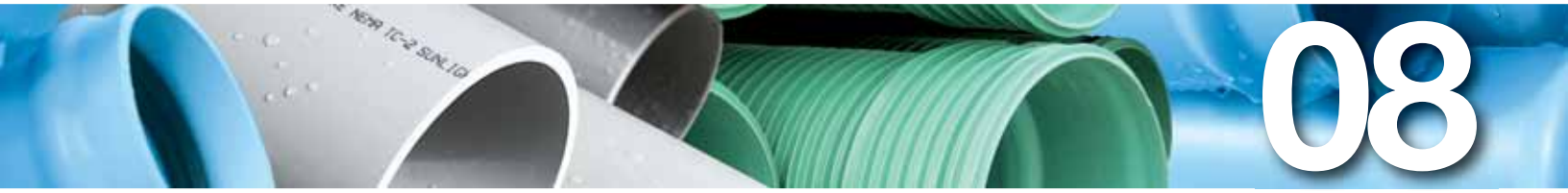
BEFORE AND DURING INSTALLATION, ALWAYS:

- 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:

- Consult and follow Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."
- Use the correct tapping tools
- Bleed air from pipes at high spot before tapping
- Use protective gear and equipment

Please contact JM Eagle™ Product Assurance at (800) 621-4404 to obtain FULL VERSION of the appropriate installation guide or for further assistance.



08

WARRANTY

JM EAGLE™ PRODUCTS LIMITED WARRANTY

J-M Manufacturing Co., Inc. (JM Eagle™) 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 JM Eagle™ within thirty (30) days of the date the defect was discovered, and within one (1) year of the date of shipment from the JM Eagle™ 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 JM Eagle™ plant. This warranty specifically excludes any Products allowed to become sun-bleached after shipment from the JM Eagle™ plant. Proof of purchase with the date thereof must be presented to the satisfaction of JM Eagle™, with any claim made pursuant to this warranty. JM Eagle™ 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 JM Eagle™ 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 JM Eagle™ of any Products claimed to be defective.

The limited and exclusive remedy for breach of this Limited Warranty shall be, at JM Eagle'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 JM Eagle™, or any other act or event beyond the control of JM Eagle™.

JM Eagle'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 JM EAGLE™ SHALL NOT BE LIABLE IN THIS RESPECT NOTWITHSTANDING JM EAGLE'S ACTUAL KNOWLEDGE THE PRODUCT'S INTENDED USE.

JM Eagle'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 JM Eagle™ 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 JM Eagle™ 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 JM Eagle™.

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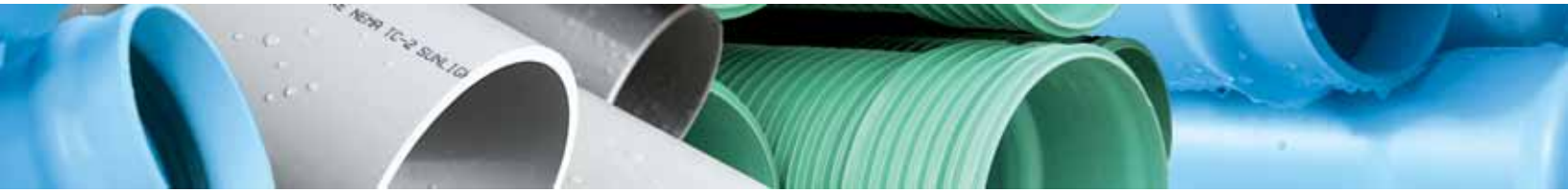

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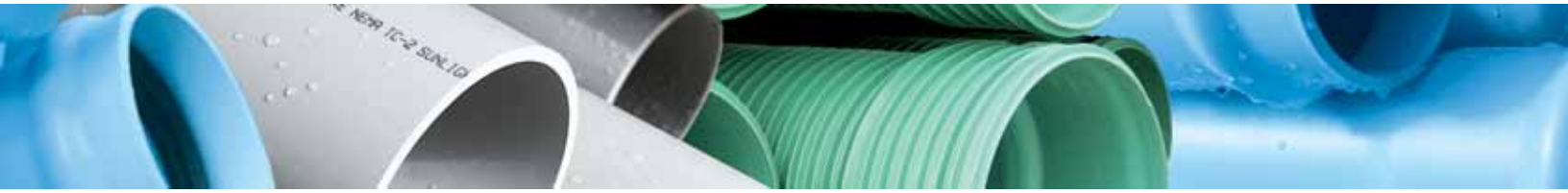

PLANT LOCATIONS

ADEL
2101 J-M Drive
Adel, Georgia 31620

BATCHELOR
2894 Marion Monk Road
Batchelor, Louisiana 70715

BUCKHANNON
Old Drop 33, Mudlick Road
Buckhannon, West Virginia 26201

BUTNER
2602 West Lyon Station Road
Creedmoor, North Carolina 27522

CAMERON PARK
3500 Robin Lane
Cameron Park, California 95682

COLUMBIA
6500 North Brown Station Road
Columbia, Missouri 65202

CONROE
101 East Avenue M
Conroe, Texas 77301

FONTANA
10990 Hemlock Avenue
Fontana, California 92337

HASTINGS
146 North Maple Avenue
Hastings, Nebraska 68901

KINGMAN
4620 Olympic Way
Kingman, Arizona 86401

MAGNOLIA
2220 Duracrete Drive
Magnolia, Arkansas 71753

MCNARY
31240 Roxbury Road
Umatilla, Oregon 97882

MEADVILLE
15661 Delano Road
Cochranton, Pennsylvania 16314

PERRIS
23711 Rider Street
Perris, California 92570

PUEBLO
1742 E. Platteville Boulevard
Pueblo West, Colorado 81007

STOCKTON
1051 Sperry Road
Stockton, California 95206

SUNNYSIDE
1820 South First Street
Sunnyside, Washington 98944

TACOMA
2330 Port of Tacoma Road
Tacoma, Washington 98421

TULSA
4501 West 49th Street
Tulsa, Oklahoma 74107

VISALIA
8875 Avenue 304
Visalia, California 93291

WHARTON
10807 US 59 RD
Wharton, Texas 77488

WILTON
1314 W. Third Street
Wilton, Iowa 52778

MEXICO
PLASTICS TECHNOLOGY
DE MÉXICO S DE R.L. DE S.A.
Av. Montes Urales No. 8 y 10
Parque Industrial Opción, Carretera
57 Qro. -S.L.P. Km. 57.8
C.P. 37980 San José Iturbide,
Guanajuato México

** Our Mexico location is a joint venture between JM Eagle™ and Plastics Technology*

GLOBAL HEADQUARTERS
5200 West Century Boulevard
Los Angeles, California 90045

REGIONAL OFFICE
Nine Peach Tree Hill Road
Livingston, New Jersey 07039

J-M Manufacturing Co., Inc. and PW Eagle, Inc. are doing business as JM Eagle™.

JM Eagle

- THE LEADER IN PIPE INNOVATION
- THE HIGHEST LEVEL OF QUALITY
- THE LARGEST BREADTH OF PRODUCT
- THE WIDEST CAPACITY
- EXPRESS DELIVERY

PLANT LOCATIONS

Revised January 2009
JME-08A

JM Eagle™

Building essentials for a better tomorrow™

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