C.R.I. PIPES

uPVC COLUMN & CASING PIPES

An ISO 9001 Company

Vision, Mission and Values

To be the industry leader providing best - in - class fluid management solutions to individual and institutional customers and societies in our chosen markets.

We will achieve this through our dedicated efforts to enhance the welfare of all our stakeholders and by living by our values of **commitment, reliability** and **innovation.**

Why uPVC column pipes?

uPVC (un-plasticised poly vinyl chloride)is a derivative of PVC compound. The following are the benefits of using an uPVC column pipe compared to Mild Steel or Galvanized steel pipes.

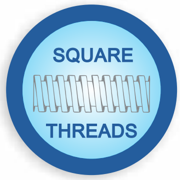
Table - 1

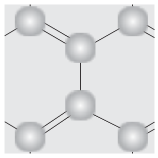
Sl No	Characteristic feature	CRI uPVC column pipe	Mild / Galvanized Steel pipe
1.	Rigidity	Pipes are rigid	Pipes are rigid
2.	Load bearing capacity	High load bearing capacity due to inherent strength and specially designed square threads.	High load bearing capacity due to heavy strength. Over a period of time, the need for re-threading arises because of rust.
3.	Leak proof joints	Special rubber seals are provided with the thread to ensure 100% leak proof.	These threads are not pressure tight and do not have any rubber sealing system. Therefore, these pipes are not leak proof.
4.	Reliability	The pipes are totally free from rust and corrosion for its entire life span.	The threads have to be reworked after few years due to corrosion & rusting. The pipe length is reduced during this process as the customer has to cut the corroded portion of thread area. It involves additional expenses for the customer.
5.	Smooth internal surface	Since the internal surface is very smooth head loss due to friction is low and water discharge is higher by 10%-30%.	Internal surface Is rough and head loss is high.
6.	Light weight and ease of installation	Pipes come in 3 metres standard length and are light weight for easy handling both during pump installation and removal.	Pipes are of heavy weight which requires tedious efforts during transportation, installation & removal.
7.	Long life	C.R.I. Drop/Riser pipes do not react with acidic or alkaline water and provide a long life inside the bore well.	These pipes are prone to rust, corrosion and ultimately get damaged and have to be replaced very quickly.

Features of C.R.I. uPVC column pipes

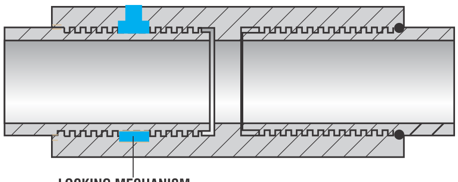
- Rigid construction & longer life span upto 25 years.
- Can be used for potable water supply.
- Specially designed square threads are capable of withstanding heavy load and are corrosion free.
- PBTS locking system: (Polymer Bond Thread Sink) To avoid the loosening of coupler during the removal of pipes, a special polymer is injected into the threads via the coupler. The polymer forms a permanent bond between the coupler and pipe, thus nullifying any possibility of coupler loosening.

- Special rubber seal is provided at the end of threads to ensure 100% leak proof joints even at high pressure.
- A special rubber (EPDM - Highstrand) ring is provided in the coupling between the two pipes to absorb the vibration caused due to high pump pressure.
- Internal surface of these pipes are very smooth, resulting in very low head loss due to friction and increases water discharge upto 30%, compared with traditional G.I. pipes, thereby saving power.
- uPVC column pipes are resistant to chemical reactions when used in acidic or alkaline waters assuring long life.
- Can handle water with maximum temperature upto 45°C.
- These pipes come in 3m Standard length and are of light weight ensuring easy handling, storage and installation.





Bi-axial orientation during column pipe extrusion



Physical and Mechanical Properties of uPVC - Table 2

Property	Unit	Standard
Specific Gravity	1.4 gms/cm³	-
Tensile Strength	627 kg/cm²	as per ASTM D 1785
Flexural Strength	647 kg/cm²	as per ASTM D 1785
Izod Impact Strength	15 kg -cm/cm²	as per ASTM D 1785
Charpy Impact Strength	17 kg -cm/cm²	as per ASTM D 1785
Impact Strength	No Fracture	-
Vicat Softening Temperature	87.3°C	as per ASTM D 1525

C.R.I. Manufactures uPVC column pipes in two types

1. Coupler 2. Bell Mouth

As you are already aware, CRI incorporates thick and thin technology during the manufacturing of uPVC column pipes, wherein the ends of the column pipe are produced thicker as compared to that of the rest of the body, which helps to maintain the strength of the pipe, even when material is removed from the pipe for the formation of threads.

Coupler type uPVC column pipe :

A part of the column pipe, called coupler, which is thicker and forms the female portion of a column pipe is produced separately. It is fused with the uPVC column pipe using PBTS technology. This process assures that the attached coupler stays in the same position as per C.R.I. standards and won't get tightened or loosened either during the installation or during the removal of the pipes.

Bell mouth type uPVC column pipe :

In Bell Mouth column pipes, instead of a seperate portion on coupler, one end of the column pipe is formed in the shape of a bell mouth, with female threads, to receive the entire length of the male threads of the next column pipe. The weight bearing capacity of these column pipes are lesser compared to that of a coupler type column pipes. For detailed information, kindly refer Table 3 & 4.

Dimension

Dimension & Weight Details (Table 3)

Size	Pipe Type	Variant	Wall thickness at ends (mm) Min.	Wall thickness at ends (mm) Max.	Wall thickness at center (mm) Min.	Wall thickness at center (mm) Max.	No. of pipes per bundle (Nos)
	OD (Min, Max) : 32.8, 33.1mm						
1 inch (DN: 25mm)	Bell Mouth	Espy	3.4	3.6	1.7	2.0	25
		Elite	3.6	3.9	1.7	2.0	25
		Medium	4.0	4.3	2.0	2.3	25
		Standard	5.2	5.5	3.1	3.4	25
	Coupler	Espy	3.4	3.6	1.7	2.0	25
		Elite	3.6	3.9	1.7	2.0	25
		Medium	4.0	4.3	2.0	2.3	25
		Standard	5.2	5.5	3.1	3.4	25
	OD (Min, Max) : 41.8, 42.1mm						
1¼ inch (DN: 32mm)	Bell Mouth	Espy	3.7	4	2	2.3	25
		Elite	4.5	4.8	2.4	2.7	25
		Medium	5.0	5.3	2.9	3.2	20
		Standard	5.5	5.8	3.4	3.7	20
	Coupler	Espy	3.7	4	2	2.3	25
		Elite	4.5	4.8	2.4	2.7	25
		Medium	5.0	5.3	2.9	3.2	20
		Standard	5.5	5.8	3.4	3.7	20
		Heavy	7.6	7.9	4.5	4.8	15
		Super Heavy	7.8	8.1	5.3	5.6	12
	OD (Min, Max) : 47.8, 48.1mm						
1½ inch (DN: 40mm)	Bell Mouth	Espy	3.8	4.1	2.3	2.6	20
		Elite	4.9	5.2	2.8	3.1	20
		Medium	5.4	5.7	3.3	3.6	15
		Standard	6.1	6.4	4.0	4.3	15
	Coupler	Espy	3.8	4.1	2.3	2.6	20
		Elite	4.9	5.2	2.8	3.1	20
		Medium	5.4	5.7	3.3	3.6	15
		Standard	6.1	6.4	4.0	4.3	15
		Heavy	8.3	8.6	5.2	5.5	12
		Super Heavy	8.5	8.8	6.0	6.3	10
	OD (Min, Max) : 59.8, 60.1 mm						
2 inch (DN: 50mm)	Bell Mouth	Elite	4.0	4.3	1.8	2.1	15
		Medium	5.1	5.4	2.6	2.9	15
		Standard	6.4	6.7	3.9	4.2	10
	Coupler	Espy	3.8	4.1	1.6	1.9	15
		Elite	4.0	4.3	1.8	2.1	15
		Medium	5.1	5.4	2.6	2.9	15
		Standard	6.4	6.7	3.5	3.8	10
		Heavy	7.8	8.1	4.7	5.0	10
		Super Heavy	9.0	9.3	6.5	6.8	8

Dimension

Size	Pipe Type	Varient	Wall thickness at ends (mm)		Wall thickness at center (mm)		No. of pipes per bundle (Nos)
			Min.	Max.	Min.	Max.	
	OD (Min, Max) : 74.7, 75.2mm						
2½ inch (DN: 65mm)	Coupler	Medium Standard Heavy Super Heavy	5.1 6.5 9.0 10.8	5.4 6.8 9.3 11.1	2.6 4.0 6.3 8.3	2.9 4.3 6.6 8.6	10 8 6 5
	OD (Min, Max) : 87.7, 88.2 mm						
3 inch (DN: 80mm)	Coupler	Medium Standard Heavy Super Heavy	5.7 7.5 9.8 12.4	6.0 7.8 10.1 12.7	3.2 4.6 6.0 9.7	3.5 4.9 6.3 10.0	8 5 5 4
	OD (Min, Max) : 112.7, 113.2 mm						
4 inch (DN: 100mm)	Coupler	Medium Standard Heavy Super Heavy	6.3 8.2 11.9 15.1	6.6 8.5 12.3 15.4	3.8 5.7 7.0 12.6	4.1 6.0 7.3 12.9	5 4 3 2
	OD (Min, Max) : 139.7, 140.2 mm						
5 inch (DN: 140mm)	Coupler	Standard Heavy Super Heavy	10.3 15.3 19.0	10.6 15.6 19.3	7.6 11.9 15.6	7.9 12.2 15.9	2 2 2
	OD (Min, Max) : 167.7, 168.2 mm						
6 inch (DN: 165mm)	Coupler	Standard Heavy Super Heavy	11.8 15.0 19.8	12.2 15.4 20.2	8.8 10.8 15.8	9.2 1.2 16.2	2 2 1
Length of pipe(3.000 mm ± 10 mm)							

* Due to continuous R & D and upgradation procedures, we may make necessary changes to the product and the values mentioned above without any prior notification.

Weight carrying capacity of uPVC column pipes - Table 4

Size	Pipe type	Varient	Recom-mended depth (m)	Approximate pipe weight for the recommended depth (kg) (A)	Approximate weight of the water in the column (kg) (B)	Approximate weight of the pump set (kg) (C)	Approximate weight of the cable (kg) (D)	Total Weight (A+B+C+D) (kg)	Ultimate breaking load (kg)	Maximum load capacity for pulling with chain pully (kg)
	OD (Min, Max) : 32.8, 33.1mm									
1 inch (DN: 25mm)	Bell Mouth	Espy	125	40	86	50	50	227	682	455
		Elite	150	51	103	55	70	281	844	563
		Medium	210	82	139	60	90	372	1,117	745
		Standard	300	167	169	65	150	553	1,660	1,107
	Coupler	Espy	125	45	86	50	50	231	700	488
		Elite	150	59	103	55	70	287	900	607
		Medium	210	92	139	60	90	381	1.200	803
		Standard	300	181	169	65	150	565	1,700	1,191
	OD (Min, Max) : 41.8, 42.1 mm									
1¼ inch (DN: 32mm)	Bell Mouth	Espy	125	56	142	70	50	321	962	641
		Elite	150	78	163	75	70	388	1,165	776
		Medium	210	125	217	80	90	515	1,544	1,029
		Standard	260	197	254	85	150	689	2,066	1,378
	Coupler	Espy	125	62	142	70	50	324	1,000	685
		Elite	150	89	163	75	70	397	1,200	838
		Medium	210	140	217	80	90	527	1,600	1,112
		Standard	260	204	254	85	150	694	2,100	1,462
		Heavy	350	336	299	90	220	945	2,900	1,990
		Super Heavy	400	433	310	130	250	1.123	3,400	2,364
	OD (Min, Max) : 47.8, 48.1 mm									
1½ inch (DN: 40mm)	Bell Mouth	Espy	125	72	185	100	50	411	1,232	821
		Elite	150	103	213	110	70	498	1,495	997
		Medium	210	163	284	120	90	660	1,987	1,321
		Standard	260	235	328	130	150	847	2,540	1,694
	Coupler	Espy	125	79	185	100	50	414	1,300	876
		Elite	150	113	213	110	70	506	1,500	1,069
		Medium	210	177	284	120	90	671	2,000	1,416
		Standard	260	265	328	130	150	873	2,700	1,840
		Heavy	350	432	388	140	220	1,180	3,600	2,485
		Super Heavy	400	537	407	160	250	1,354	2,500	1,722
	OD (Min, Max) : 59.8, 60.1 mm									
2 inch (DN: 50mm)	Bell Mouth	Espy	70	40	177	150	70	440	1,321	880
		Elite	90	57	225	150	70	506	1,518	1,012
		Medium	130	110	306	160	90	671	2,012	1,342
		Standard	200	232	428	170	150	984	2,951	1,968
	Coupler	Espy	70	47	177	150	70	444	1,400	940
		Elite	90	70	225	150	70	515	1,600	1,091
		Medium	130	128	306	160	90	685	2,100	1,447
		Standard	200	259	428	170	150	1,007	3,100	2,124
		Heavy	270	449	517	180	220	1,366	4,100	2,877
		Super Heavy	350	708	1,056	200	250	2,214	6,700	4,663

Size	Pipe type	Variant	Recom-mended depth (m)	Approximate pipe weight for the recommended depth (kg) (A)	Approximate weight of the water in the column (kg) (B)	Approximate weight of the pump set (kg) (C)	Approximate weight of the cable (kg) (D)	Total Weight (A+B+C+D) (kg)	Ultimate breaking load (kg)	Maximum load capacity for pulling with chain pully (kg)
	OD (Min, Max) : 74.7, 75.2 mm									
2½ inch (DN: 65mm)	Coupler	Medium Standard Heavy Super Heavy	100 160 260 350	125 269 629 1,083	382 564 795 937	270 290 310 350	90 150 220 250	868 1,273 1,954 2,620	2,700 3,900 5,900 7,900	1,835 2,686 4,116 5,517
	OD (Min, Max) : 87.7, 88.2 mm									
3 inch (DN: 80mm)	Coupler	Medium Standard Heavy Super Heavy	110 170 260 350	189 401 829 1,443	575 812 1,100 1,293	375 400 450 450	90 150 220 280	1,229 1,763 2,586 3,466	3,700 5,300 7,800 10,400	2,596 3,717 5,474 7,296
	OD (Min, Max) : 112.7, 113.2 mm									
4 inch (DN: 100mm)	Coupler	Medium Standard Heavy Super Heavy	100 150 260 350	257 517 1,359 2,403	872 1,215 1,811 2,118	500 500 550 550	70 180 280 280	1,699 2,412 4,000 5,351	5,200 7,300 12,000 16,100	3,592 5,090 8,426 11,265
	OD (Min, Max) : 139.7, 140.2 mm									
5 inch (DN: 140mm)	Coupler	Standard Heavy Super Heavy	160 260 350	888 2,154 3,792	1,956 2,756 3,252	600 650 650	220 280 300	3,664 5,840 7,994	11,000 17,500 24,000	7,726 12,301 16,825
	OD (Min, Max) : 167.7, 168.2 mm									
6 inch (DN: 165mm)	Coupler	Standard Heavy Super Heavy	170 260 350	1,325 2,397 4,002	3,019 4,374 5,112	750 750 800	350 450 500	5,443 7,972 10,413	16,400 24,000 31,500	11,483 16,793 21,931
Effective length of the pipe(3,000 mm ± 10 mm)										

* Due to continuous R & D and upgradation procedures, we may make necessary changes to the product and the values mentioned above without any prior notification.

APPROXIMATE FRICTIONAL HEAD LOSS IN C.R.I. STANDARD TYPE COLUMN PIPES

FLOW		NOMINAL DIAMETER OF PIPE (INCHES/MM) (Table - 5)								
m³/h	l/min.	1" / 25	1¼" / 32	1½" / 40	2" / 50	2½" / 65	3" / 80	4" / 100	5" / 125	6" / 150
1	16.67	1.758	0.570	0.199	0.056	0.018	0.009			
1.5	25.00	3.575	1.158	0.404	0.121	0.037	0.018	0.005	0.002	0.001
2	33.33	5.914	1.917	0.668	0.200	0.061	0.029	0.009	0.003	0.001
2.5	41.67	8.739	2.832	0.987	0.296	0.090	0.043	0.012	0.004	0.002
3	50.00	12.023	3.897	1.358	0.407	0.123	0.059	0.017	0.005	0.002
3.5	58.33	15.747	5.103	1.779	0.533	0.162	0.077	0.022	0.007	0.003
4	66.67	19.892	6.447	2.247	0.674	0.204	0.098	0.028	0.009	0.004
4.5	75.00	24.446	7.922	2.761	0.828	0.251	0.120	0.034	0.011	0.004
5	83.33	29.396	9.526	3.320	0.996	0.302	0.144	0.041	0.013	0.005
6	100.00	40.443	13.107	4.568	1.370	0.415	0.198	0.056	0.017	0.007
7	116.67	52.967	17.165	5.983	1.794	0.544	0.260	0.074	0.023	0.01
8	133.33		21.683	7.557	2.267	0.687	0.328	0.093	0.029	0.012
9	150.00		26.647	9.287	2.785	0.844	0.403	0.115	0.036	0.015
10	166.67		29.534	11.168	3.349	1.015	0.485	0.138	0.043	0.018
12	200.00		36.849	12.699	4.608	1.397	0.668	0.190	0.059	0.025
14	233.33		48.657	16.761	6.035	1.830	0.874	0.248	0.078	0.032
16	266.67			21.321	6.312	2.310	1.104	0.314	0.099	0.041
18	300.00			26.368	7.803	2.840	1.357	0.386	0.122	0.051
20	333.33			31.891	9.435	3.080	1.502	0.464	0.148	0.061
22	366.67			37.883	11.204	3.351	1.696	0.548	0.175	0.072
24	400.00			44.334	13.108	3.920	1.859	0.638	0.205	0.085
26	433.33				15.146	4.528	2.147	0.734	0.237	0.098
28	466.67				17.316	5.176	2.453	0.835	0.27	0.112
30	500.00				19.615	5.862	2.778	0.979	0.306	0.126
35	583.33				25.921	7.743	3.669	1.028	0.404	0.167
40	666.67				33.010	9.856	4.669	1.307	0.515	0.212
45	750.00				40.863	12.196	5.776	1.617	0.638	0.263
50	833.33				49.466	14.759	6.988	1.955	0.772	0.318
55	916.67					17.540	8.303	2.323	0.982	0.378
60	1000.00					20.537	9.720	2.718	1.151	0.443
65	1083.33					23.746	11.237	3.142	1.332	0.513
70	1166.67					27.164	12.853	3.592	1.525	0.587
75	1250.00					30.789	14.566	4.070	1.73	0.666
80	1333.33					34.619	16.375	4.575	1.947	0.749
85	1416.67					38.651	18.281	5.106	2.039	0.855
90	1500.00					42.885	20.280	5.664	2.265	0.929
95	1583.33					47.317	22.374	6.247	2.502	1.026
100	1666.67						24.560	6.856	2.75	1.128
105	1750.00						26.839	7.491	3.009	1.233
110	1833.33						29.209	8.151	3.279	1.344
115	1916.67						31.670	8.837	3.56	1.458

HEAD LOSS IN METERS, FOR 100M LENGTH OF PIPE

Friction loss calculated using
Darcy - Weisbach equation
hfs = 4f (L/D) (V^2 / 2)g
for H_2O at 20°C

* Due to continuous R & D and upgradation procedures, we may make necessary changes to the product and the values mentioned above without any prior notification.

APPROXIMATE FRICTIONAL HEAD LOSS IN C.R.I. HEAVY TYPE COLUMN PIPES

HEAD LOSS IN METERS, FOR 100M LENGTH OF PIPE

FLOW		NOMINAL DIAMETER OF PIPE (INCHES/MM) (Table -6)								
m³/h	l/min.	1" / 25	1¼" / 32	1½" / 40	2" / 50	2½" / 65	3" / 80	4" / 100	5" / 125	6" / 150
1	16.67	2.596	0.587	0.295	0.089	0.029	0.014			
1.5	25.00	5.277	1.193	0.599	0.181	0.060	0.028	0.009	0.002	
2	33.33	8.731	1.974	0.990	0.299	0.099	0.046	0.015	0.003	0.001
2.5	41.67	12.902	2.917	1.464	0.442	0.147	0.068	0.021	0.004	0.002
3	50.00	17.751	4.013	2.014	0.609	0.203	0.094	0.029	0.006	0.002
3.5	58.33	23.248	5.257	2.638	0.797	0.265	0.123	0.039	0.008	0.003
4	66.67	29.368	6.640	3.332	1.007	0.335	0.155	0.049	0.01	0.004
4.5	75.00	36.090	8.160	4.095	1.237	0.412	0.190	0.060	0.012	0.005
5	83.33	43.398	9.812	4.924	1.488	0.495	0.229	0.072	0.014	0.006
6	100.00	59.708	13.500	6.774	2.047	0.682	0.315	0.099	0.019	0.008
7	116.67	64.634	17.680	8.871	2.681	0.893	0.412	0.130	0.025	0.01
8	133.33		22.335	11.207	3.387	1.128	0.521	0.164	0.032	0.013
9	150.00		27.448	13.772	4.162	1.386	0.640	0.201	0.04	0.016
10	166.67		32.340	16.560	5.002	1.667	0.770	0.242	0.048	0.019
12	200.00		37.969	18.910	6.886	2.293	1.059	0.334	0.066	0.026
14	233.33		50.135	24.963	7.448	3.002	1.387	0.438	0.087	0.034
16	266.67			31.759	9.472	3.793	1.652	0.553	0.11	0.043
18	300.00			39.281	11.711	3.854	1.903	0.679	0.136	0.053
20	333.33			47.513	14.161	4.659	2.134	0.817	0.164	0.065
22	366.67			56.445	16.819	5.531	2.533	0.965	0.195	0.077
24	400.00				19.679	6.470	2.963	1.066	0.228	0.089
26	433.33				22.741	7.476	3.422	1.124	0.263	0.103
28	466.67				25.994	8.545	3.911	1.220	0.301	0.118
30	500.00				29.454	9.678	4.429	1.380	0.34	0.134
35	583.33				38.931	12.787	5.850	1.822	0.449	0.176
40	666.67				49.585	16.280	7.446	2.319	0.572	0.224
45	750.00					20.148	9.213	2.868	0.708	0.277
50	833.33					24.385	11.148	3.469	0.858	0.336
55	916.67					28.984	13.248	4.121	1.02	0.399
60	1000.00					33.940	15.510	4.823	1.195	0.468
65	1083.33					39.247	17.933	5.576	1.383	0.541
70	1166.67					44.901	20.513	6.376	1.584	0.619
75	1250.00					50.899	23.250	7.225	1.797	0.702
80	1333.33					57.236	26.140	8.121	2.022	0.79
85	1416.67						29.183	9.065	2.26	0.883
90	1500.00						32.378	10.056	2.51	0.98
95	1583.33						35.723	11.093	2.772	1.082
100	1666.67						39.216	12.176	3.047	1.189
105	1750.00						42.857	13.304	3.333	1.301
110	1833.33						46.644	14.477	3.632	1.417
115	1916.67						50.577	15.696	3.942	1.538

Friction loss calculated using
Darcy - Weisbach equation
hfs = 4f (L/D) (V^2 / 2)g
for H_2O at 20°C

Selection of Pipes

Pump delivery pressure: It is the maximum delivery head of the pump. In the pump performance curves, it is the value of the head at which the flow becomes zero. In the column, for every 10m above the pump, there is a pressure drop of 1 kg/cm^2. Hence, the pump delivery pressure will be (230 / 10 = 23 kg/cm^2.

The column pipes must be selected from the variants available, such that the pump delivery pressure does not exceed the permissible hydrostatic pressure of the pipe. Also, care should be taken that while selecting the pipe it must be ensured that the total load is very well within the recommended ultimate breaking load.

For example, in the below performance table of a four inch C.R.I. Submersible pump model S4S-8/37 (**boxed** in red) with an outlet of 2 inches, the value of the head at zero delivery is 230 meters.

Table - 7

PUMP MODEL	MOTOR kW	lps	0	0.83	1.11	1.39	1.66	1.94	2.22	2.50	2.78	3.05
		m³/h	0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0
S4S-8/05	0.75	TOTAL MANOMETRIC HEAD IN METRES - (COLUMN WATER)	32	27	25	23.5	22	20	18	16	13.5	11
S4S-8/07	1.1		42	38.5	37	35.5	34	31.5	27	24.5	20	16
S4S-8/09	1.5		55	50	48.5	46	44	41.5	37.5	33.5	28	22
S4S-8/10	1.5		63	55	52	50	48	44	40	36	30	24
S4S-8/12	2.2		74	68.5	67	64	61	56	51	44.5	37	27.5
S4S-8/15	2.2		94	85.5	82.5	79	74.5	69	63	55	46.5	36
S4S-8/18	3		108	104.5	101	96	91	84	76	66.5	56	44
S4S-8/22	4		132	126	121	115	108	99	90	79	67	54
S4S-8/25	4		155	141	136	129	121.5	112	102.5	91	78	62
S4S-8/30	5.5		182	164	156	148	139	130	120	107	90	71
S4S-8/34	5.5		202	185	179	171	162.5	153	140	126	107	85
S4S-8/37	5.5		230	204	195	185	173	162	146	131	112	89
S4S-8/44	7.5		262	237	228	217	205	191	177	156	129	100
S4S-8/50	7.5		304	272	261	249	235	220	200	176	148	112

Permissible Hydrostatic pressure of C.R.I. uPVC column pipes (Table - 8) **(10 m = 1 kg/cm^2)**

Variant / Nominal Diameter	1 inch (25 mm)		1¼ inch (32 mm)		1½ inch (40 mm)		2 inch (50 mm)		2½ inch (65 mm)	3 inch (80 mm)	4 inch (100 mm)	5 inch (140 mm)	6 inch (165 mm)
Pipe Type	Bell Mouth	Coupler	Bell Mouth	Coupler	Bell Mouth	Coupler	Bell Mouth	Coupler	Coupler	Coupler	Coupler	Coupler	Coupler
Epsy	12.5	12.5	12.5	12.5	12.5	12.5	7	7	-	-	-	-	-
Elite	15	15	15	15	15	15	9	9	-	-	-	-	-
Medium	21	21	21	21	21	21	13	13	10	11	10	-	-
Standard	30	30	26	26	26	26	20	20	16	17	15	16	17
Heavy	-	-	-	35	-	35	-	27	26	26	26	26	26
Super Heavy	-	-	-	40	-	40	-	35	35	35	35	35	35

If the requirement is for a coupler type column pipe, matching the outlet same as the pump, we have to choose a 2" coupler column pipe. The variant of the pipe is to be choosen such that the permissible hydrostatic pressure of the column pipe is higher than the pump delivery pressure. Hence, a 2" heavy coupler type column pipe is best suitable for this application.

Accessories

Bottom adaptor: This is a metal accessory, that is used to connect the first piece of uPVC column pipe to the submersible pump. As explained, to enable higher load bearing capacity, C.R.I. column pipes are equipped with square threads. Whereas, the submersible pumps are generally with V threads. Since, the joint cannot be made due to various threads and pitches, an adaptor is used.

The female portion of the bottom adaptor is square threaded and the male portion is V threaded. We supply these adaptors in Cast Iron, Mild Steel and Stainless steel 304 grades.

Top adaptor: This is a metal accessory, that is used to connect the last piece of uPVC column pipe to the outlet / discharge bend. As explained, to enable higher load bearing capacity, C.R.I. column pipes are equipped with square threads. Generally, the outlet / discharge bend, are with V threads. Since, the joint cannot be made due to various threads and pitches, an adaptor is used.

The male portion of the top adaptor is square threaded and the female portion is V threaded. We supply these adaptors in Cast Iron, Mild Steel and Stainless steel 304 grades.

Pump Guard: In the entire length of the column, the first joint of column pipe with the submersible pump is the weakest one. C.R.I. uPVC column pipes are produced considering this factor. Even though, as an extra precautionary care, a pump guard is recommended as an accessory.

A Pump guard set consists of a short length pipe of the same size and variant as the other column pipes, along with two stainless steel rods, two flanges, nuts and cotter pins. When a pump guard is used, even if a fracture happens at the fist joint, the pump will not slip into the borehole and it would be easy to retrieve the pump.

Expander / Reducer: If the customer has a requirement of usage of an uPVC column pipe higher or lower in size with respect to the pump outlet, an Expander or Reducer is used, respectively. These are a variant of bottom adaptors and are provided according to customer request.

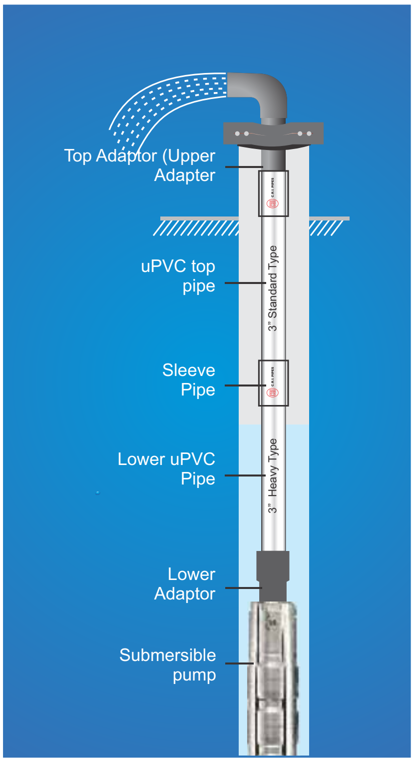
Lowering Jig: It is an accessory which is used to lower the pipe in the borewell. The male end of the Lowering Jig is with square threads to fit into the pipe and the other end is provided with a hook, which can be tied up to the chain of the tripod stand, enabling easier lowering of the pipes.

Belt Wrench: It is a type of wrench used to tighten the uPVC column pipes. SInce chain wrenches cannot be used on the uPVC column pipes, belt wrenches are recommended.

Clamps: These are the C clamps used to fix the column pipe at the outlet on the top of the borewell.

Installation Procedure:

- First connect the male end of the bottom adaptor (C.I. / S.S) firmly to the pump discharge housing using a pipe wrench and first pipe can be connected to the female end.
- Before connecting clean both the ends of the pipes with clean water and check rubber seal ring for any damage.
- The pipe can be tightened by hand itself but, while tightening water has to be poured on pipe threads for lubrication. Anyhow for better grip belt wrench can be used to tighten / hold the pipes.
- Tighten the pipes by hand, until the rubber seal ring in the pipe end completely enters in to the coupling.
- Submersible pump cable need to be tied in regular intervals along with the column pipes, for securing the cable from getting damaged.
- At the time of lowering the pump into borehole the C-clamp must be fastened only to the pipe portion marked as “CLAMP HERE”.
- Then all other pipes can also be connected in the same way. Pipe wrench or chain wrench should not be used for tightening the pipes.
- Once the top column pipe reaches the ground level, connect the top adaptor with male end connection.
- Finally from the ground level regular plumbing accessories can be used to transfer water to required delivery point.



NOTE : Separate earth conductor should be used for earthing the submersible pump, as these pipes are insulators.

Precautions:

Installation Conditions:

Full casing of bore well is recommended for long life of bore and pump. It prevents the pump from getting stuck due to loose boulders, stones, soil and silt. It also reduces the chance of accident due to protruding stones and boulders at the time of removing the pump and pipe.

Removal Conditions:

At the time of removal of pumps from bores, it is advisable to ensure that there is no accumulation of boulders, stones and silt. During removal in case pump gets stuck due to such accumulation, proper flushing of the borehole should be done before applying the pulling load on the pipes.

Avoid Dry Run of Pump:

Dry run of submersible pump generates hot air which can damage/ deform the first Column Pipe connected with the pump. To avoid this:

- Use timer switch to turn on or off the pump automatically as per the pre-set time, determined after assessing the bore yield.
- Use of 3 metres S.S. Pipe between pump and C.R.I. uPVC Column Pipe will help dissipate the heat, preventing any damage or deformation.

Prevention of Water Hammer:

At the time of pump stoppage, water recedes/falls at tremendous speed from a height. Especially in deep bore wells of about 500 ft & above, this creates enormous pressure and load on the pump which leads to damage of pump and pipe. For such deep bore wells, it is recommended to make a 3mm hole in the pump NRV to protect the pump and pipe from water hammering.

Casing & Screen pipe :

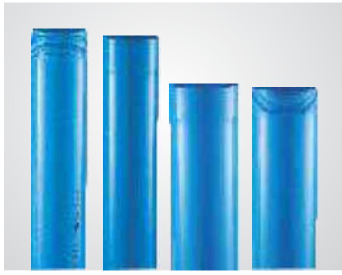
The important component of any water well are its casing & screening pipes. Properly selected and installed, they will ensure that the water well / borehole remains intact and that it continues to remain a perennial source of clean water.

Until a few years ago, metal pipes and screens were the only option for these applications. The inherent disadvantages were corrosion of casing pipes, deterioration of screens and formation of bacteria, resulting in the abandonment of wells, and sometimes even, contamination of the water source.

We at C.R.I. manufacture uPVC casing and screen pipes as per IS 12818:2010 standards. They are available in different sizes ranging from 40 mm to 300 mm. These pipes can be used in any of the irrigation, domestic, mining and industrial boreholes, helping to keep out the gravel pack and foreign particles, providing clean and clear water.

Well Casing pipes are necessary to exclude the shallow groundwater, protect the pump and support the unstable upper layers of loose soil and rock from collapsing into the borehole.

Deeper down, the groundwater flow system may be through unstable sands and gravels, or highly fractured and weathered bedrock aquifers. In both the cases, it is important to stablise the aquifer strata, and at the same time, allow the groundwater to flow easily into the borehole. A Well Screen pipe is installed to achieve this purpose.



Advantages of C.R.I. uPVC casing & screen pipes:

- Corrosion resistant: Being of plastic material, these pipes do not corrode.
- Lightweight: These pipes are light in weight and and are easy to transport. It is a big advantage in the areas where the road conditions are not good.
- Easy to handle and install: High quality threaded joints ensure easy assembly and installation at the site.
- Non-Conductive: These pipes are non reactive and thus no electro-chemical reaction takes place with water, thus preventing encrustation in the pipes.
- Economical: Compared to other alternatives, these pipes are economical to the end user.
- Longer Life: Life cycle more than 30 years, saves replacement and replenishments costs.
- Ensuring water quality: These pipes donot impart any colour, taste or odour to the water
- Stiffness and strength: these pipes are embedded with excellent mechanical properties, thus are capable of withstanding the hydraulic pressure, the pipes are subjected during the construction of the well.
- Convenient and reliable: Provides easy and stronger joints.
- C.R.I. uPVC casing pipes are provided with Trapezoidal threads which provide easy and strong joints.
- C.R.I. uPVC screen pipes facilitate optimum performance & safety by keeping the gravel pack & other foreign substances out of the well.
- C.R.I. uPVC screen pipes has horizontal slots which enables laminar flow into the well ensuring higher permeability and reducing well entrance losses, thus saving pumping energy and offer higher yields.

Kindly note, it is recommended that the diameter of the casing should be atleast 2” (50 mm) greater than the outer diameter of the pump. Also, kindly ensure that the installed length of the pump chamber is sufficient to accommodate the pump even when the pumping water level is at its lowest.

Casing Pipe Dimension Details:

CS Pipes (Table 9) for shallow wells upto 80m depth

Nominal Size - DN (mm)	Pipe size in inches	Outer Diameter		O.D at any point		Mean OD over Connection	Wall Thickness (mm)	
		Min.	Max.	Min.	Max.	Max.	Min.	Max.
100	4"	113	113.3	112.9	113.4	119	3.9	4.6
115	4.5"	125.00	125.30	124.90	125.40	Non ISI	4.2	4.8
125	5"	140.00	140.40	139.90	140.50	Non ISI	5.20	6.00
150	6"	165.00	165.40	164.60	165.60	174.00	5.70	6.50
180	6.5"	180.00	180.50	179.80	180.60	Non ISI	7.00	7.80
175	7"	200.00	200.50	199.60	200.60	211.00	7.00	7.80
200	8"	225.00	225.50	224.50	225.80	238.00	7.60	8.80
250	10"	280.00	280.50	279.40	280.80	292.00	9.60	11.00
300	12"	330.00	330.60	329.30	331.00	346.00	11.20	13.30

CM Pipes (Table 10) for medium wells upto 250m depth

Nominal Size - DN (mm)	Pipe size in inches	Outer Diameter		O.D at any point		Mean OD over Connection	Wall Thickness (mm)	
		Min.	Max.	Min.	Max.	Max.	Min.	Max.
35	1.25"	42.00	42.20	41.90	42.30	46.00	3.50	4.00
40	1.5"	48.00	48.20	47.90	48.30	52.00	3.50	4.00
50	2"	60.00	60.20	59.90	60.30	65.00	4.00	4.60
80	3"	88.00	88.30	87.90	88.40	94.00	4.00	4.60
100	4"	113.00	113.30	112.90	113.40	120.00	5.00	5.70
115	4.5"	125.00	125.30	124.90	125.40	132.00	5.00	5.70
125	5"	140.00	140.40	139.90	140.50	150.00	6.50	7.30
150	6"	165.00	165.40	164.60	165.60	178.00	7.50	8.50
180	6.5"	180.00	180.50	179.80	180.60	Non ISI	8.00	8.80
175	7"	200.00	200.50	199.60	200.60	215.00	8.80	9.80
200	8"	225.00	225.50	224.50	225.80	243.00	10.00	11.20
240	8.5"	240.00	240.50	239.50	240.80	Non ISI	10.40	11.50
250	10"	280.00	280.50	279.40	280.80	298.00	12.50	14.00
300	12"	330.00	330.60	329.30	331.00	352.00	14.50	16.20

CD Pipes (Table 11) for deep wells upto 400 mtrs depth								
Nominal Size - DN (mm)	Pipe size in inches	Outer Diameter		O.D at any point		Mean OD over Connection	Wall Thickness (mm)	
		Min.	Max.	Min.	Max.	Max.	Min.	Max.
100	4"	113.00	113.30	112.90	113.40	125.00	7.00	7.90
115	4.5"	125.00	125.30	124.90	125.40	137.00	7.50	8.50
125	5"	140.00	140.40	139.90	140.50	152.00	8.00	9.00
150	6"	165.00	165.40	164.60	165.60	180.00	9.50	10.70
180	6.5"	180.00	180.50	179.80	180.60	Non ISI	10.20	11.40
175	7"	200.00	200.50	199.60	200.60	217.00	11.80	13.60
200	8"	225.00	225.50	224.50	225.80	247.00	13.00	14.80
240	8.5"	240.00	240.50	239.50	240.80	Non ISI	11.50	12.50
250	10"	280	280.5	279.4	280.8	304	16	17.6
300	12"	330	330.6	329.3	331	359	19	21

* Due to continuous R & D and upgradation procedures, we may make necessary changes to the product and the values mentioned above without any prior notification.

Screen Pipe Dimensions As per IS 12818:2010

Ribbed Medium Well Screen (RMS) Pipes (Table 12)

Nominal Size - DN (mm)	Pipe size in inches	Outer Diameter		O.D at any point		Mean OD over	Wall Thickness (mm)	
		Min.	Max.	Min.	Max.	Max.	Min.	Max.
35	1.25"	46	46.2	45.90	46.30	50.00	3.50	4.00
40	1.5"	52	52.2	51.90	52.30	56.00	3.50	4.00
50	2"	64	64.2	63.90	64.30	69.00	4.00	4.60
80	3"	92	92.3	91.80	92.40	98.00	4.00	4.60
100	4"	117.00	117.30	116.80	117.40	124.00	5.00	5.70
115	4.5"	129.00	129.30	128.80	129.40	136.00	5.00	5.70
125	5"	144.00	114.40	143.70	144.50	154.00	6.50	7.30
150	6"	169.00	169.40	168.60	169.60	182.00	7.50	8.50
175	7"	204.00	204.50	203.60	204.60	219.00	8.80	9.80
200	8"	229.00	229.50	228.50	229.80	247.00	10.00	11.20
250	10"	284.00	284.50	283.40	284.80	302.00	12.50	14.00
300	12"	334.00	334.60	333.40	335.00	356.00	14.50	16.20

Ribbed Deep Well Screen (RDS) Pipes (Table 13)

Nominal Size - DN (mm)	Pipe size in inches	Outer Diameter		O.D at any point		Mean OD over	Wall Thickness (mm)	
		Min.	Max.	Min.	Max.	Max.	Min.	Max.
100	4"	117.00	117.30	116.80	117.40	129.00	7.00	7.90
115	4.5"	129.00	129.30	128.80	129.40	141.00	7.50	8.50
125	5"	144.00	144.40	143.70	144.50	156.00	8.00	9.00
150	6"	169.00	169.40	168.60	169.60	184.00	9.50	10.70
175	7"	204.00	204.50	203.60	204.60	221.00	11.80	13.60
200	8"	229.00	229.50	228.50	229.80	251.00	13.00	14.80
250	10"	284.00	284.50	283.40	284.80	309	16	17.6
300	12"	334.00	334.60	333.30	335.00	363	19	21

Plain Medium Well Screen (PMS) Pipes (Table 14)

Nominal Size - DN (mm)	Pipe size in inches	Outer Diameter		O.D at any point		Mean OD over	Wall Thickness (mm)	
		Min.	Max.	Min.	Max.	Max.	Min.	Max.
200	8"	225.00	225.50	224.50	225.80	243.00	10.00	11.20
250	10"	280.00	280.50	279.40	280.80	298.00	12.50	14.00
300	12"	330.00	330.60	329.30	331.00	352.00	14.50	16.20

Plain Deep Well Screen (PDS) Pipes (Table 15)

Nominal Size - DN (mm)	Pipe size in inches	Outer Diameter		O.D at any point		Mean OD over	Wall Thickness (mm)	
		Min.	Max.	Min.	Max.	Max.	Min.	Max.
200	8"	225.00	225.50	224.50	225.80	247.00	13.00	14.80
250	10"	280.00	280.50	279.40	280.80	304	16	17.6
300	12"	330.00	330.60	329.30	331.00	359	19	21

* Due to continuous R & D and upgradation procedures, we may make necessary changes to the product and the values mentioned above without any prior notification.

Installation Procedure:

- Arrange the pipe assembly on the ground
- Fix the centering guides on the pipes once in every 15 meters (minimum), just below the neck of the socket, with the open end of the centering guides facing upwards while lowering.
- Always use a plain casing pipe (sand trap) for the first pipe to be lowered, with a conical end cap (Bullnose) blanking the spigot end of the pipe. Fill this pipe with water or drilling fluid before lowering into the well.
- Wash the reamed borehole thoroughly with fresh drilling fluid (Bentonite Solution) for 40-45 minutes from the bottom, keeping the specific gravity of the drilling fluid to below 1.4. This will prevent heavy sedimentation at the bottom of the borehole and also easy lowering of the assembly.
- To obtain better results, ensure that the reamed borehole is at least 15 to 20cms more than the outside diameter of the casing pipe.
- The sand trap is the lowest pipe in a tubewell and is the first to be selected. Fit this pipe with an end plug (cap) and centering guide.
- Lower the sand trap into the borehole and hold with a split clamp with the socketed end facing upward.
- The next pipe, which is either a screen pipe or a plain pipe (depending on lithology of well) is fitted to the sand trap by screwing them together.
- Jointing of pipes can be done either by belt wrench or with manila rope. Never use a chain wrench. Clean the threads to remove mud or burrs using wire brush. Soap solution may be used to lubricate the joints. Avoid grease or waste oil.
- Fit the socketed end of the next pipe (which can be a screen/plain casing) with the fitting cap.
- Connect the lifting cap securely with the wire rope of the drilling frame.
- Use winch of drilling machine to lift the threaded pipe string.
- This pipe string is jointed to the pipe already lowered into the borehole.
- Centre the assembled pipe string and permit it to descend into the borehole by releasing the split clamp, Fill the pipe with water or mud solution to equalize pressure.
- Repeat the operation till all the casings and screens are lowered according to the lithology of the well. The time needed to make each joint is less than 5 minutes.
- Lowering time can be reduced by jointing the casings and screens on the ground to make additional lengths. Do this correctly as per lithology of well to avoid wrong placement of screens in the bore well.
- Do not set the lowered pipe assembly at the bottom of the borehole. Ensure at least 10 feet of free bore below the sand trap. This helps the lowered casing and screen pipes to remain hanging and achieve a vertical installation.
- Centering guides should always be fixed at a minimum interval of 1.5 meters to ensure uniform gravel packing around the casing and screen pipes.

Accessories :

End cap : These are used for sealing the bottom and top of the casing and screen pipe and to avoid the entrance of any foreign particles into the borehole.

Centering Guides : These are used in casing and screen pipes to ensure proper positioning of the casing in the borehole and uniform gravel packing around the casing and screen pipes.

Quality control :

We at C.R.I. adopt and follow stringent quality control procedures starting right from the procurement of raw materials, during production, and test the final products from each and every batch that are produced and also before shipping the goods to our customer. Hence, without any hesitation, we proclaim, we supply our customers the best quality of the products in the market.

We believe that Change is constant and we continuously upgrade and adapt ourselves to the latest technologies available in the market. Hence, our customers can be assured that they are owning the product, which is a derivative of these latest technologies and a constant innovation in design for better quality.

Some of the tests that are conducted on our pipes are (Table 16)

Tests	C.R.I. Requirement	Standard
Specific Gravity	1.40 to 1.46 g/cc	As per IS 12818:2010
Tensile Strength	Not less than 45MPa	As per IS 12818:2010
Impact strength @ $0^{o}C$	No Fracture	As per IS 12818:2010
Vicat Softening Temperature	Not Less Than $80^{o}C$	As per IS 12818:2010
Izod Impact Strength	15 kg - cm/cm^2	As per ASTM D 1785
Charpy Impact Strength	17 kg - cm/cm^2	As per ASTM D 1785

Bundling and Telescopic stuffing of uPVC column pipes:

The pipes are batched and bundled in alternative directions for the proper utilization of the space in the bundle. Also, in case of the requirement for multiple sizes of pipes, on customer request and if feasible, we do telescopic stuffing of the pipes, i.e. we stuff smaller pipes inside the bigger pipes, for maximum utilization of the space inside the container.

Handling & Storage of pipes:

Even though our pipes are rigid, they are to be handled with reasonable care. It is suggested to avoid throwing of the pipes or bundles of pipe on the floor. The pipes should not be dragged or pushed from the bed of the truck or container. On the receipt of the pipes, kindly check and inspect for any damage that has occurred during transportation or improper handling / treatment. In all cases, severe contact with any sharp objects such as nails, rocks, angle irons, pieces of glass, etc. should be totally avoided.

Preferably, the pipes are to be stored indoors. If this is not viable, the pipes should be stored on level ground which is dry and free from sharp objects, properly covered avoiding exposure to direct sunlight. If different variants of pipes are to be stacked together, the pipe with the thicker walls should be at the bottom. Kindly see to it that the pipes are placed in alternative layers, perpendicular to each other, with the first layer in a square shape. The maximum stacking height of these pipes should be 7 feet.

Container stuffing:

The maximum length of each bundle of pipe is 3.3 meters. Hence, a maximum of three rows of pipe can be stuffed in a 40 foot container. Whereas, in a 20 foot container only one row of pipe can be stuffed. Hence, it is advised to our customers, to order the pipes in a 40 foot container, which significantly reduces their cost of investment per pipe. The remaining space in the container is used to stuff other accessories, which are required to install the uPVC column pipes.

Frequently Asked Questions:

1. Why only C.R.I. uPVC Drop / Riser pipes?

C.R.I. is an ISO 9001, ISO 14001 and OHSAS 18001 certified company. It has introduced several new products to suit the customer's requirements and these products are well accepted across the continents. C.R.I. has a well developed distributor, dealer and service network in India and we have 11 subsidiaries across the globe.

2. What are the benefits of uPVC pipes over steel pipes?

Savings on (a) Cost of pipes (b) Handling time (c) Power (d) Upto 30% higher water discharge (e) Longer working life (f) Zero maintenance.

3. What is the expected life of C.R.I. Column Pipes?

C.R.I. Column Pipe system design & standards incorporate significant engineering safety factors which should translate to a long service life. C.R.I. Column Pipe System have a design service life span up to 25 years. C.R.I. Column Pipe System is not susceptible to corrosion, scale build up or electrolysis in areas where water, solid and / or atmospheric conditions are aggressive. C.R.I. firmly believes that the system will provide a service life as long or longer than alternative materials in the market.

4. How do you say that this is better than the traditional GI pipes?

These pipes are lesser in weight, easy installation procedure, less manpower required, no rust after any number of years, economical, no friction loss, this will support motor, take less load and give longer life, and customers can use these pipes at full depth with full confidence.

5. How the usage of the pipe affect on the quantity and quality of water?

Due to smooth internal surface, friction is low and therefore we get upto 30% more water compared to steel / GI pipes. Over a period of use, the steel pipes get corroded, rusted and the water quality deteriorates. In C.R.I. uPVC pipes, since there is no corrosion or chemical reaction throughout the depth of column pipe, the water quality remains the same as the source.

6. Can we compare the strength of uPVC pipes with a steel pipe?

The specific gravity of uPVC is 1.4-1.45 gm/cm3 where as the steel has 8 gm/cm3. Taking the strength of the material into consideration, the pipes are optimally designed to make them lite without any compromise in their strength requirements.

7. Why is there a variation in thickness of the pipes?

The end of the pipes are made thicker so that even after making the threads and removal of material the thickness of the pipe remains the same under the threads so that the strength of pipe is maintained throughout.

8. Can uPVC pipes take load of the pump?

C.R.I. Drop / Riser pipes are designed to withstand not only the weight of the pump, but also the weight of the pipes itself, weight of the water in the column and also weight of the cables to supply electricity with additional factor of safety. Thus these pipes hold several times the weight of entire column filled with water and pump assembly.

9. Up to what depth can the pipes be lowered?

The depth of the bore well may differ from place to place depending upon the water level in the borewell. C.R.I. offers a range of pipes to suit the customer's requirement of various depths and they have been successfully used upto the depths as mentioned against them (Kindly refer Table 3). Proper selection of C.R.I. pipes can be made for various depth applications after a careful study of the pump pressure and the technical booklet.

10. Does Drop / Riser pipes need full casing in the bore?

These pipes give the best service and performance in borewells that have full casing or borewells which are free from loose boulders and stones. In areas where loose boulders and stones are prevalent, full casing is recommended, which helps in tackling the bore collapse problem. Care should be taken during drilling of the borewell so that it is vertically down without any bend.

11. What should be the bore size with respect to the outside diameter of the pump?

For bore wells without casing pipe, specially in areas with loose boulders and soil are present, it is suggested that the borewell size should be minimum 2” more than the pump outer diameter. This helps to prevent pump getting stuck up. For borewells with casing, a minimum gap of 1½” between the Casing internal diameter and pump outer diameter is required.

12. What happens if a bore collapses?

The pump and the pipes can be pulled out only in cases where the applied force for lifting the assembly is within the ultimate breaking strength of the pipe as mentioned in the charts. In case of severe bore collapse and boulder problems even the retrieval of steel pipes is impossible.

13. If situation demands is it advisable re-threading at site?

No, it is not allowed to cut or re-thread the pipes on site. These pipes are threaded on highly sophisticated CNC machines with highest dimensional accuracy. This type of perfection is not possible at site.

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EC-CCP2 - 11/18-E1