

SAFEFIT™

Borewell Systems for
Groundwater Extraction

Safefit UPVC submersible rising main pipes are used for borewell applications. They are manufactured using high quality PVC compound. The smooth finish surface ensures minimum water friction. These pipes are most economical for installation and transportation. Due to its high tensile strength, it can withstand high impact and are optimal for applications requiring high durability. Being light in weight, it is easy to handle & install.



*ZERO DEFECT MANUFACTURING PROCESS

Pipes as per
IS:12818



GOES DEEP,
STAYS SAFE.



SPECIFICATIONS

Pipes	
Material	Unplasticized Polyvinyl Chloride (UPVC)
Colour	Blue
Reference Standards	IS 12818 : 2010
End Connections	Threaded Joint

To construct a borewell, the pipes mentioned below are required:

- SCREEN PIPE.
- CASING PIPE.
- SUBMERSIBLE DELIVERY PIPE.

SCREEN PIPE:

UPVC **SCREEN** or Slotted casing pipes are used in aquifer yields through sandy zones to protect the collapse of the borewell side walls and to prevent the entry of fine sand into the borewell, which might clog the borewell.

Guidelines for selection of SCREEN pipe:

The following should be considered while selecting the ribbed screen pipes:

- Permeability of the screen should be greater than that of the sand & gravel layer adjusted to the screen exterior.
- Slot width should be selected so as to permit the construction of sand or gravel screen around the well screen during development.

A) PLAIN SCREEN pipe.

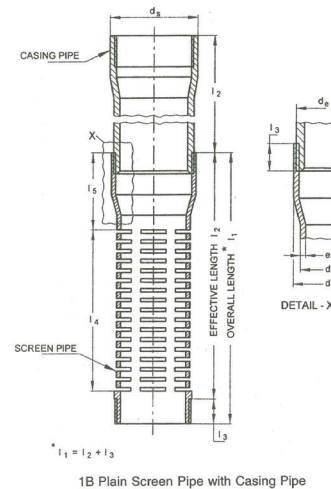
DIMENSIONS OF PLAIN MEDIUM WELL SCREEN (PMS) & PLAIN DEEP WELL SCREEN (PDS) PIPES

Nominal Diameter (DN)		Plain Medium Well Screen (PMS)					Plain Deep Well Screen (PDS)				
		Mean Outer Diameter of pipe (d) (mm)		Mean Outer Diameter over Connection, (d's) (mm)	Wall Thickness (e) (mm)		Outer Diameter at any point d'e (mm)		Mean Outer Diameter over Connection, d's' (mm)	Wall Thickness, 'e' (mm)	
Inches	mm	Min	Max		Max	Min	Max	Min		Max	Max
8	200.0	225.00	225.50	243.00	10.00	11.20	224.50	225.80	247.00	13.00	14.80
10	250.0	280.00	280.50	298.00	12.50	14.00	279.40	280.80	304.00	16.00	17.60
12	300.0	330.00	330.60	352.00	14.50	16.20	329.30	331.00	359.00	19.00	21.00
14	350.0	400.00	400.70	428.00	17.50	19.50	399.20	401.20	433.00	21.50	23.90
16	400.0	450.00	450.80	479.00	19.50	21.70	449.10	451.30	490.00	23.50	26.10

B) RIBBED SCREEN pipe.

DIMENSIONS OF MEDIUM WELL SCREEN (RMS) & DEEP WELL SCREEN (RDS) PIPES WITH RIBS / RIBBED SCREEN PIPES

Nominal Diameter (DN)		Medium Well Screen (RMS)					Deep Well Screen (RDS)			
		Mean Outer Diameter of pipe (d) (mm)		Mean Outer Diameter over Connection, (d's) (mm)	Wall Thickness (e) (under ribs) (mm)		Mean Outer Diameter over Connection, (d's) (mm)		Wall Thickness, 'e' (mm)	
Inches	mm	Min	Max		Max	Min	Max	Max	Min	Max
1 1/2	40.0	52.00	52.20	56.00	3.50	4.00	--	--	--	
2	50.0	64.00	64.20	69.00	4.00	4.60	--	--	--	
3	80.0	92.00	92.30	98.00	4.00	4.60	--	--	--	
4	100.0	117.00	117.30	124.00	5.00	5.70	129.00	7.00	7.90	
4 1/2	115.0	129.00	129.30	--	--	--	141.00	7.50	8.50	
5	125.0	144.00	144.40	154.00	6.50	7.30	156.00	8.00	9.00	
6	150.0	169.00	169.40	182.00	7.50	8.50	184.00	9.50	10.70	
7	175.0	204.00	204.50	219.00	8.80	9.80	221.00	11.80	13.60	
8	200.0	229.00	229.50	247.00	10.00	11.20	251.00	13.00	14.80	
10	250.0	284.00	284.50	302.00	12.50	14.00	309.00	16.00	17.60	
12	300.0	334.00	334.60	356.00	14.50	16.20	363.00	19.00	21.00	
14	350.0	404.00	404.70	432.00	17.50	19.50	437.00	21.50	23.90	
16	400.0	454.00	454.80	483.00	19.50	21.70	494.00	23.50	26.10	



Specification (Plain & ribbed screen pipe):-

Colour: Blue

Standard length: 3 mts.

Type of threads: V- threads up to 80 mm & 100 mm CS; As per IS- 554- 1999.

Trapezoidal threads from 100 mm; As per IS- 12818 – 2010 (With rubber ring)

CASING PIPE:

CASING pipes are highly recommended in the area where loose soil & silt / loose boulders & loose stones are prevalent. The pipes protect the borewell from collagen.

These pipes are manufactured as per BIS standards. Pipes are available in 3 mtr. length in blue colour.

These pipes are available in two types; Shallow Well (C.S) & Medium well (C.M); Shallow Well pipes are recommended is for depths up to 80 mts. & Medium Well up to 250 meters depth.

(C.D.); Deep well casing pipe suitable for wells with depths above 250m and upto 450m

One end of the pipe has male thread and the other end is a female threaded socket. Threads are V or trapezoidal type and protection caps are provided on the threads to protect the threads during handling.

V-threads are used up to 80mm / 100mm (CS) casing pipe as per IS-554-1999

Trapezoidal threads are used from 100mm as per IS-12818-2000.

Guidelines for selection of CASING pipe:

The following should be considered while selecting the casing pipes:

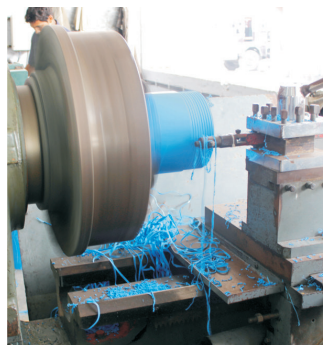
- The wall thickness should be so chosen as to withstand the anticipated external pressure loading subjected during and after installation.
- For vertical shaft pump I.D. of casing pipe should be at least 50mm greater than OD of the pump.
- While in casing of Submersible pipe it should be at least 80mm greater.



DIMENSIONS OF MEDIUM WELL CASING (CM) & SHALLOW WELL CASING (CS) PIPES

Nominal Diameter (DN)	Mean Outer Diameter of pipe (d) (mm)	Medium Well Casing (CM) Pipes			Shallow Well Casing (CS) Pipes				
		Mean Outer Diameter over Connection, (d's) (mm)	Wall Thickness e (mm)	Mean Outer Diameter over Connection, (d's) (mm)	Wall Thickness, 'e' (mm)				
Inches	mm	Min	Max	Max	Min	Max	Max	Min	Max
1 1/2	40.0	48.00	48.20	52.00	3.50	4.00	--	--	--
2	50.0	60.00	60.20	65.00	4.00	4.60	--	--	--
3	80.0	88.00	88.30	94.00	4.00	4.60	--	--	--
4	100.0	113.00	113.30	120.00	5.00	5.70	--	--	--
5	125.0	140.00	140.40	150.00	6.50	7.30	--	--	--
6	150.0	165.00	165.40	178.00	7.50	8.50	174.00	5.70	6.50
7	175.0	200.00	200.50	215.00	8.80	9.80	211.00	7.00	7.80
8	200.0	225.00	225.50	243.00	10.00	11.20	238.00	7.60	8.80
10	250.0	280.00	280.50	298.00	12.50	14.00	292.00	9.60	11.00
12	300.0	330.00	330.60	352.00	14.50	16.20	--	--	--

Note:- 32mm (1 1/4") Nominal Diameter pipes are available on special request.



DIMENSIONS OF DEEP WELL CASING (CD) PIPES

Nominal Diameter (DN)	Mean Outer Diameter of pipe d'em' (mm)	Outer Diameter at any point d'e' (mm.)	Mean outer Diameter over Connection, (d's) (mm)	Wall thickness, 'e' (mm.)				
Inches	mm	Min	Max	Min	Max	Max	Min	Max
4	100.0	113.00	113.30	112.80	113.40	125.00	7.00	7.90
4 1/2	115.0	125.00	125.30	124.90	125.40	137.00	7.50	8.50
5	125.0	140.00	140.40	139.70	140.50	152.00	8.00	9.00
6	150.0	165.00	165.40	164.60	165.60	180.00	9.50	10.70
7	175.0	200.00	200.50	199.60	200.60	217.00	11.80	13.60
8	200.0	225.00	225.50	224.50	225.80	247.00	13.00	14.80
10	250.0	280.00	280.50	279.40	280.80	304.00	16.00	17.60
12	300.0	330.00	330.60	329.30	331.00	359.00	19.00	21.00
14	350.0	400.00	400.70	399.20	401.20	433.00	21.50	23.90
16	400.0	450.00	450.80	449.10	451.30	490.00	23.50	26.10

Specifications:

Colour: All CM, CD & CS pipes are available in blue colour.

Length: 3 mts. (CM, CD & CS).

Type of threads: V & Trapezoidal

SUBMERSIBLE DELIVERY PIPE

SAFEFIT UPVC submersible Delivery Pipes are specially designed, manufactured & tested with modern high quality computerised equipment to ensure their fitness for safe use in borewell.

These pipes are available from 25 to 100mm nominal dia. Categories Viz - V4, MEDIUM, STANDARD & HEAVY have different pressure ratings. These pipes have female threaded coupler fixed at one end & integral male threads at the other end, ensuring easy installation with perfect joints.



FEATURES:

- Light weight • Easy to install • Excellent corrosion resistance
- High tensile load capacity • Leak proof joints • Smooth internal surface
- Long life • Economical • Non conductive, eliminates electro chemical reaction with ground water • Suitable up to depth 1200 mts.

SPECIFICATIONS:

Colour: Ivory
Length: 3 mtr.
Type of threads: Square

PRODUCT RANGE:

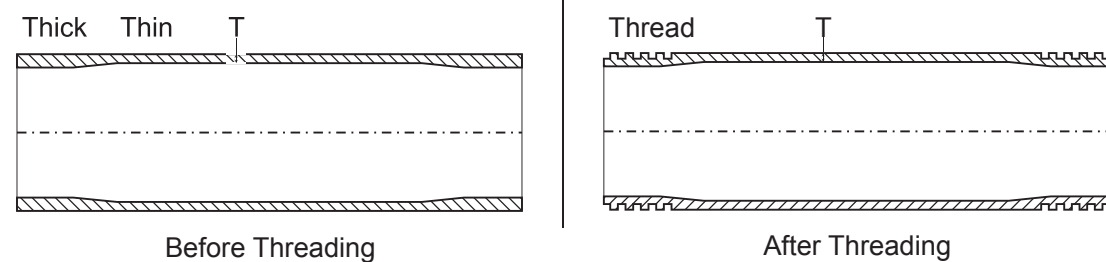
Submersible Delivery Pipe Technical details:

PRODUCT RANGE					
Sr.No	Size-(mm)	V4	MEDIUM	STANDARD	HEAVY
1	25	✓	✓	✓	-----
2	32	✓	✓	✓	✓
3	40	✓	✓	✓	✓
4	50		✓	✓	✓
5	65		✓	✓	✓
6	80		✓	✓	✓
7	100		✓	✓	✓
Note: -	✓	Symbol indicates category available.			

THICK & THIN TECHNIQUE:

This unique technique is used for thickening the wall thickness of the pipe at the end of the pipe. This helps to compensate the wall thickness reduction due to removal of material during threading operation at both the ends of the pipe & maintains the required wall thickness underneath the threads.

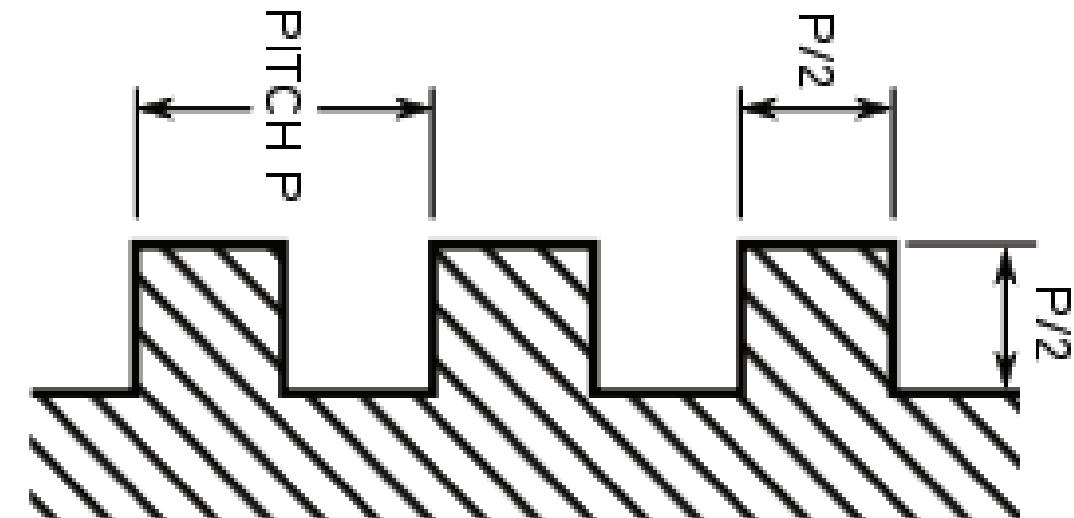
Below figures are self explanatory in understanding the details of thick & thin technique.



SQUARE THREADS :

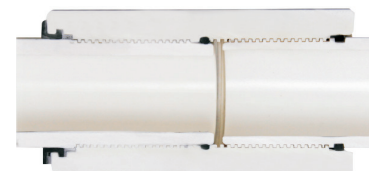
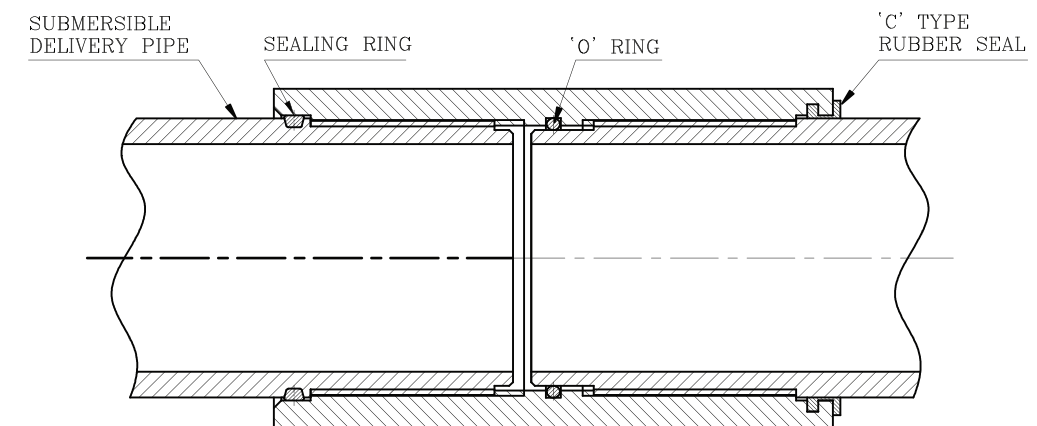
The square threads provided at both ends of the pipe are cut on CNC machine, ensuring dimensional accuracy & therefore interchangeability.

The greatest advantage of square threads is that they have a much higher intrinsic strength. Due to lack of thread angle, there is no radial pressure or bursting pressure on the pipe during installation & operation which increases the life of the threaded pipe portion. These threads also ensure proper gripping & avoid the chances of slipping during operation. Square threads also withstand considerable shock during operation.



LEAK-PROOF & SHOCK ABSORBING JOINTING METHOD:

Specially designed & tested rubber seals ensure leak proof jointing of the pipe & coupler & also absorb the shocks during operation.



SPECIFICATION OF PRINCE SAFEFIT SUBMERSIBLE DELIVERY PIPE

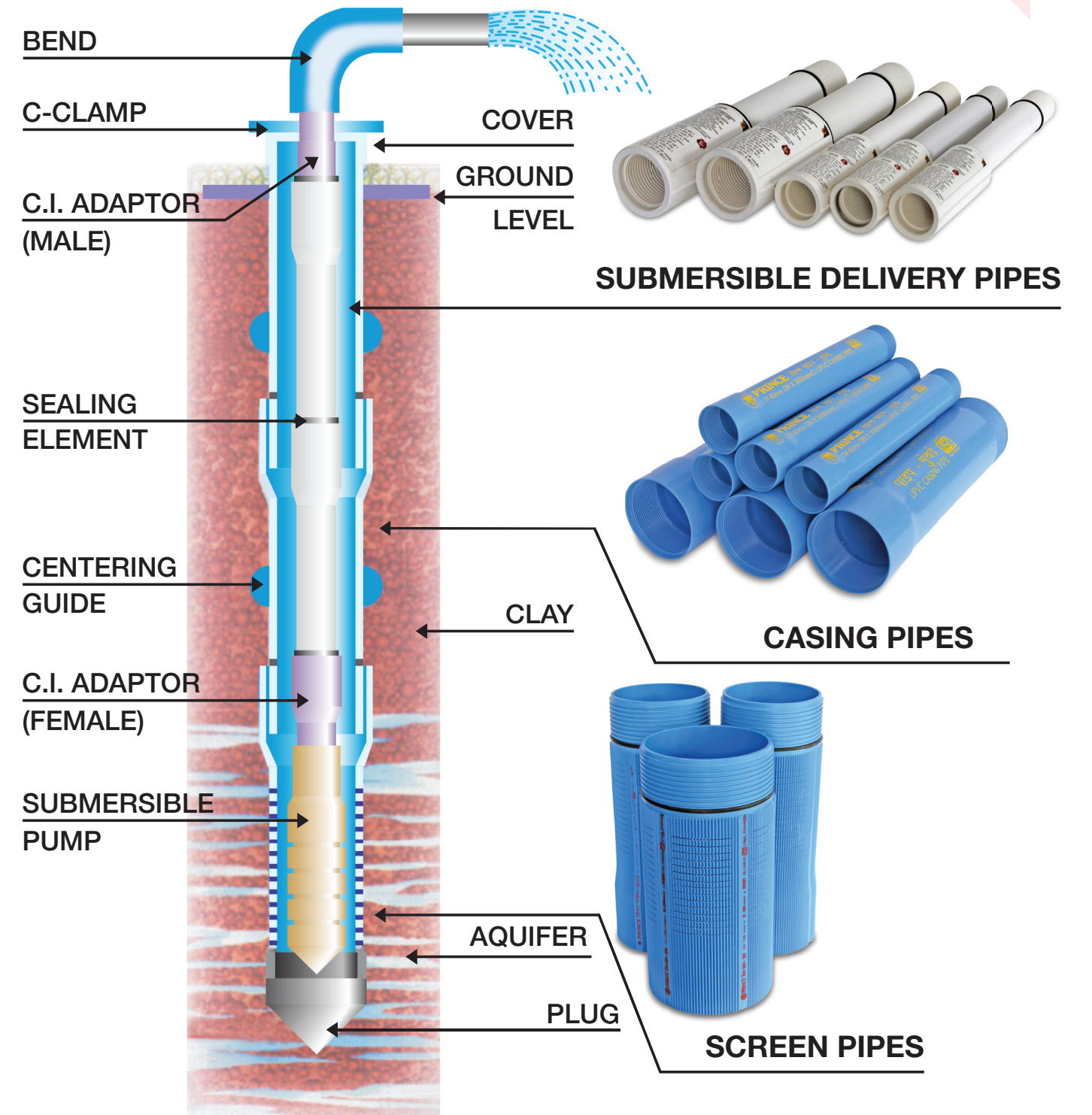
Product OD- Outside Dia. ND- Nominal Dia. in mm		Outside Diameter (OD) in mm	WALL THICKNESS (T) in mm		PIPE Length (l-1) in mm	Length of Thick portion on both sides of pipe - in mm	Coupler length (l-2)- in mm	Pipe length including coupler (L= l-1 +l-2) in mm
Size	Category	Min/Max	THICK Min/Max	THIN Min/Max				
1"- OD-33.30 ND-25.00	V4	33.30/33.50	3.70/4.00	1.95/2.30	2935 +/- 10	200-200	130	3000 +/- 10
	Medium	33.30/33.50	3.80/4.20	2.50/3.30	2935 +/- 10	200-200	130	3000 +/- 10
	Std	33.30/33.50	5.80/6.30	4.00/4.50	2935 +/- 10	200-200	130	3000 +/- 10
1 1/4"- OD-42.10 ND-32.00	V4	42.10/42.30	4.25/4.50	2.45/2.80	2935 +/- 10	200-200	130	3000 +/- 10
	Medium	42.10/42.30	4.85/5.35	3.00/3.25	2935 +/- 10	200-200	130	3000 +/- 10
	Std	42.10/42.30	6.10/6.60	4.15/4.65	2935 +/- 10	200-200	130	3000 +/- 10
1 1/2"- OD-48.20 ND-40.00	V4	48.20/48.40	4.55/5.00	2.70/3.10	2935 +/- 10	200-200	130	3000 +/- 10
	Medium	48.20/48.40	5.40/6.00	3.55/4.00	2935 +/- 10	200-200	130	3000 +/- 10
	Std	48.20/48.40	6.10/6.60	4.15/4.65	2935 +/- 10	200-200	130	3000 +/- 10
2"- OD-60.20 ND-50.00	Medium	60.20/60.50	5.20/5.70	3.00/3.15	2925 +/-10	200-200	152	3000 +/- 10
	Std	60.20/60.50	6.50/7.00	4.20/4.70	2925 +/-10	200-200	152	3000 +/- 10
	Heavy	60.20/60.50	7.90/8.40	5.30/6.70	2925 +/-10	200-200	152	3000 +/- 10
2 1/2"- OD-75.00 ND-65.00	Medium	76.00/76.30	5.40/6.00	3.55/4.00	2925 +/-10	200-200	152	3000 +/- 10
	Std	76.00/76.30	6.60/7.10	4.20/4.70	2925 +/-10	200-200	152	3000 +/- 10
	Heavy	76.00/76.30	9.10/9.60	6.40/6.90	2925 +/-10	200-200	152	3000 +/- 10
3"- OD-88.00 ND-80.00	Medium	88.00/88.30	5.70/6.00	3.35/3.50	2925 +/-10	200-200	152	3000 +/- 10
	Std	88.00/88.30	7.60/8.30	5.10/5.70	2925 +/-10	200-200	152	3000 +/- 10
	Heavy	88.00/88.30	9.90/10.60	7.55/8.10	2925 +/-10	200-200	152	3000 +/- 10
4"- OD-113.00 ND-100.00	Medium	113.00/113.30	6.40/7.10	3.95/4.50	2915 +/-10	200-200	170	3000 +/- 10
	Std	113.00/113.30	8.40/9.10	5.80/6.30	2915 +/-10	200-200	170	3000 +/- 10
	Heavy	113.00/113.30	12.30/13.00	9.65/10.15	2915 +/-10	200-200	170	3000 +/- 10

SPECIFICATION OF PRINCE SAFEFIT SUBMERSIBLE DELIVERY PIPES / RISING MAIN PIPES

Product OD - Outside Dia. ND - Nominal Dia. in mm			Pressure kg/cm ²	Safe total pump delivery Head (m)	Ultimate Breaking Load (kg)	Safe Pulling Load (kg)	Screen Colour	STD Packing
Size	Type	Category						
1" OD-33.30 ND-25.00	Coupler	V4	12.5	125	850	500	Royal Claret	28
		V4	17	170	950	600	Green	
		Medium	22	220	1250	750	Orange	
		Std	38	380	1750	1100	Red	
1 1/4" OD-42.10 ND-32.00	Coupler	V4	12.5	125	1350	800	Royal Claret	20
		V4	17	170	1500	900	Green	
		Medium	21	210	1725	1000	Orange	
		Std	30	300	2350	1400	Red	
1 1/2" OD-48.20 ND-40.00	Coupler	V4	16	160	1850	1100	Green	16
		Medium	22	220	2400	1450	Orange	
		Std	26	260	2750	1650	Red	
		Heavy	39	390	3700	2250	Blue	
2" OD-60.20 ND-50.00	Coupler	Medium	14	140	2450	1450	Orange	12
		Std	20	200	3500	2100	Red	
		Heavy	27	270	4600	2800	Blue	
2 1/2" OD-75.00 ND-65.00	Coupler	Medium	11	110	3100	1800	Orange	8
		Std	16	160	4500	2700	Red	
		Heavy	26	260	6450	3900	Blue	
3" OD-88.00 ND-80.00	Coupler	Medium	11	110	4100	2450	Orange	6
		Std	17	170	6400	3800	Red	
		Heavy	26	260	8900	5300	Blue	
4" OD-113.00 ND-100.00	Coupler	Medium	10	100	6500	3900	Orange	4
		Std	15	150	9250	5550	Red	
		Heavy	26	260	14450	8700	Blue	

Note:- Submersible Pipes with "Bell Form" available on 1" & 1 1/4" -V4 category with 12.5 & 17Kg Pressure rating).

▶ FOR BOREWELL & TUBE WELL APPLICATIONS



▶ FEATURES & BENEFITS

- ▶ Easy to transport, store, handle and install.
- ▶ Saves labour & installation cost.
- ▶ Smooth bore ensures higher flow compared to G. I. pipeline of the same size. No clogging.
- ▶ Bore diameter remains constant, ensuring constant flow over lifetime.
- ▶ Superior resistance to most of the chemicals, no scaling, makes the system almost maintenance free.
- ▶ Long Life.

▶ APPLICATIONS

- ▶ Water provision for farms & fields.
- ▶ Water connections for buildings, railway stations & schools etc.

▶ JOINTING METHODS

Process

- ▶ Threaded Joint

Storage / handling of pipes:

- Pipe shall be stored in shade on reasonably flat surfaces, free from sharp objects.
- Don't drag / throw the pipes during handling to avoid thread damages.
- Don't dump the pipes over each other.
- Don't remove the packing & thread protection covers of pipes till the time of installation.

Installation of Borewell system:

DO's:

- Ensure that pipe threads are proper and clean it with normal water to avoid forceful jointing.
- Ensure that rubber seal is properly placed in its position, without twist/cut, while tightening the threads to avoid leakages.
- Before joining the pipe with pump, it is recommended to provide pump guard between pipe coupler & pump metal adaptor.
- Assemble the PRINCE G I metal adaptor with pump.
- During assembly of the pipe, initially hold the pipe / coupler with hands & tighten it, for final jerk, always use rope / strap wrench to tighten the pipe properly.
- Fix a nylon rope to cast iron adaptor as a safety measure against falling of submersible pump due to mishap.
- Clamp the pipe below coupler (at defined location on pipe) at the time of lowering PRINCE rising main pipe in to the borewell.
- Always use chain pulley for lowering PRINCE rising main pipe.

Extensively used in:



Don'ts:

- Don't use any chemical for cleaning the pipe thread.
- Don't apply any lubricant on pipe thread.
- Don't over-tighten the joints to avoid breakages.
- Don't use pipe / chain wrench to tighten the joints.
- Don't dump gravel at a very high rate to avoid excess abrasion.
- Don't use agri-pipes (with solvent cement joint) for borewells as their mechanical strength is not designed for this application.
- Don't hammer the pipes during assembly.

Guidelines for Installation of SCREEN & CASING PIPE.

- Drill the bore of the required size & depth in the ground using the method of auger drilling/water jet boring /hydraulic rotary drilling/core drilling. During drilling, care should be taken that it is vertically straight down without any bends.

Note:

I) To construct the bore/tube wells CASING/SCREENING & RISING MAIN pipes are required.

II) CASING pipes are highly recommended in the area where loose soil & silt / loose boulders & loose stones are prevalent).

- Fit the rubber gasket properly on the space provided on the ribbed screen / casing pipes.
- Fit "C" clamp below the bell end on the pipe and lower the assembly done with help of chain pulley block (Provide sand trap with end plug as necessary).
- After lowering the pipe up to the clamp level, fix the rubber gasket on another pipe & tighten it gently with the lowered pipe. After tightening, use pipe / chain wrench for proper jointing, but do not over tighten.
- Fix the next clamp with this above pipe, below bell end & connect the chain pulley with clamp.
- Remove the clamp of lowered pipe & start lowering further.
- Repeat the jointing method till the required depth of borewell.
- Centering guide to be fitted wherever necessary.
- Fill the gravel between pipe & bore hole.

Guidelines for Installation of RISING MAIN PIPE.

Once screen & casing pipes are installed properly, follow the below guidelines for installation of PUMP & SUBMERSIBLE DELIVERY PIPE.

- Before starting installation, pre-check if submersible pump is in good working condition.
- Join the PRINCE metal adaptor with the submersible pump with the help of chain wrench.
- Before starting the pipe assembly, clean the pipe threads with normal water to avoid forceful jointing.
- Before joining the pipe with pump; ensure pump guard is installed properly between pipe coupler & pump metal adaptor.
- Assemble SUBMERSIBLE DELIVERY PIPE with pump, always use strap wrench/rope for last jerk.
- Fix a nylon rope to cast iron adaptor as a safety measure against falling of submersible pump due to mishap (run the nylon rope throughout the borewell length & tie it with top clamp).
- Fit the "C" clamp below coupler (at defined location on pipe) & lower the assembly inside the CASING pipe carefully with the help of chain pulley.
- Once pipe will be lowered in the borewell up to the clamp level, fix the rubber ring on other pipe & tighten it gently with the help of rope / strap wrench, till half of the ring gets inside the coupler.
- Fix the next clamp with this above pipe, connect the chain pulley with clamp & lower down it in the borewell.
- Repeat the jointing method till the required depth of the borewell.
- Once installation of SUBMERSIBLE DELIVERY PIPE will be over, install the C.I. cap for protection, against falling of any external element inside the borewell and finally install the "C" clamp.



► ILLUSTRATION



Join Metal connector to submersible pipe with the help of chain wrench.



Before starting pipe assembly clean the pipe threads with clean water.



Before joining the pipe with the pump, ensure pump guard is installed properly.



Before opening or joining the pipe, ensure the coupler is firmly held by the hand.



Tighten pipe till half rubber ring is seen with hand. If required use rope wrench to give a final jerk.



Tighten pipe till half rubber ring is seen with hand, if required use belt wrench for final jerk.



Lower SUBMERSIBLE DELIVERY PIPE with the help of a chain pulley.