

ASTRAL PIPES

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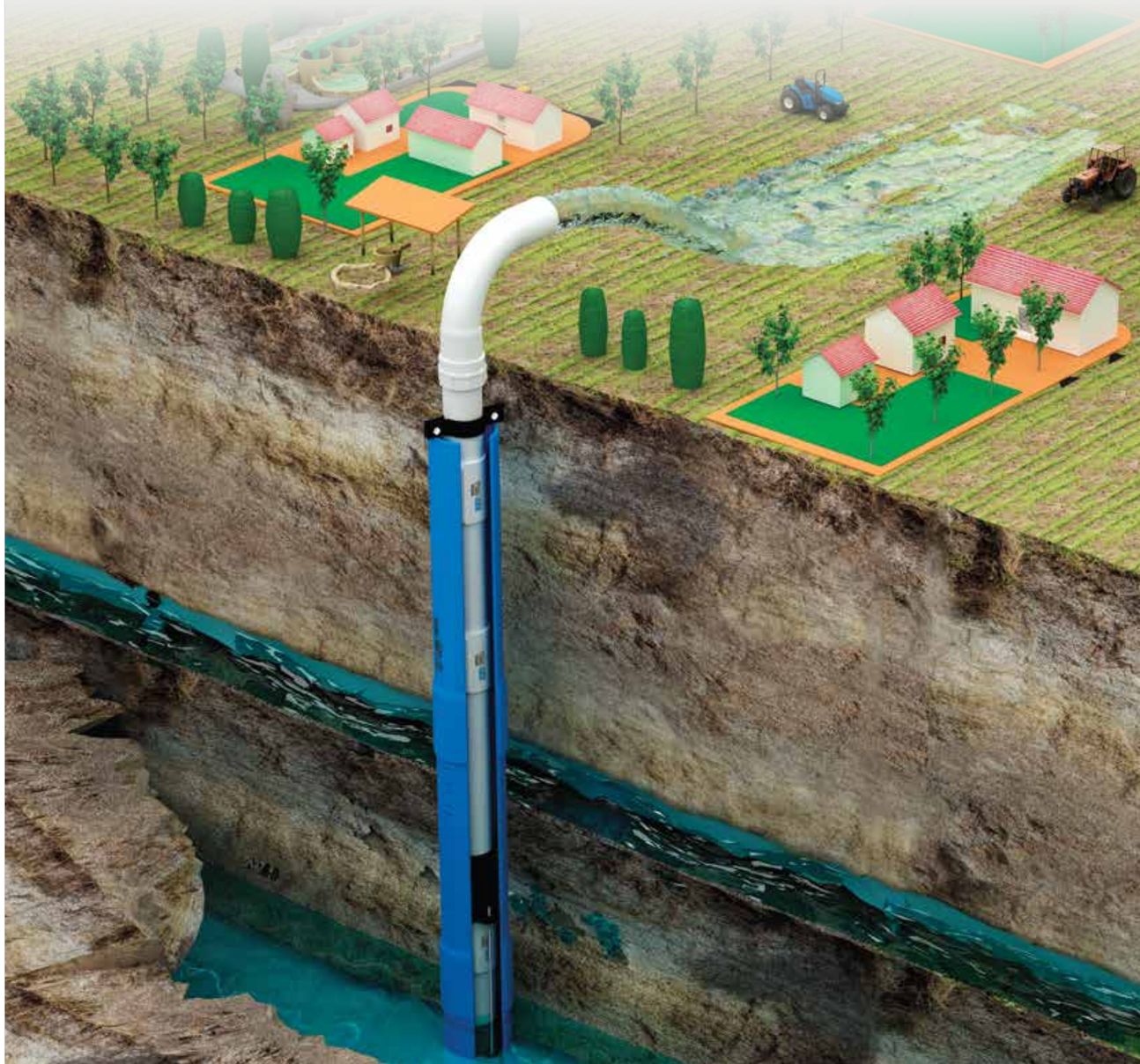
ASTRAL PIPES

BORE-WELL® LEAD FREE UPVC COLUMN PIPES | CASE-WELL® CASING FOR BOREWELL

# uPVC BORE-WELL

## COLUMN PIPES FOR SUBMERSIBLE PUMPS

PRODUCT CATALOGUE



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# ASTRAL, INDIA'S PROGRESSIVE PIPE COMPANY

Established in 1996 with the aim to manufacture best-in-globe plastic piping systems, Astral Pipes fulfils emerging piping needs of millions of houses and adds extra mileage to India's developing real estate fraternity with the hallmark of unbeaten quality and innovative piping solutions. Keeping itself ahead of the technology curve, Astral has always been a front runner in the piping category by bringing innovation and getting rid of old, primitive and ineffective plumbing methods. Bringing CPVC in India, and pioneering in this technology, have set Astral apart and its highest quality enabled it to obtain NSF approval for its CPVC pipes and fittings. Astral went beyond the category codes by launching many industry firsts, like launching India's first lead-free uPVC pipes for plumbing as well as for stream water, just to name a few.

Astral Pipes offers the widest product range across this category when it comes to product applications. Astral Pipes is equipped with production facilities at Santej and Dholka in Gujarat, Hosur in Tamil Nadu, Ghiloth in Rajasthan and Sangli in Maharashtra to manufacture plumbing systems, drainage systems, agriculture systems, fire sprinkler piping systems, industrial piping and electrical conduit pipes with all kinds of necessary fittings.

Astral Pipes' Infrastructure division Rex offers a comprehensive product range including corrugated piping for drainage and cables, polyolefin cable channels, sewage treatment plants, plastic sheathing ducts, suction hoses, and sub-surface drainage systems. This range helps Astral to establish a strong foothold in infrastructure and agriculture sector in the constantly evolving business of piping.

In 2014, Astral forayed into the adhesives category by acquiring UK-based Seal It Services Ltd. and Kanpur based Resinova Chemie Ltd., which manufacture adhesives, sealants and construction chemicals. With five manufacturing facilities now in this business segment, Astral has strengthened its presence in the category and made rapid inroads.

# **INNOVATION** & RECOGNITIONS

- First to introduce CPVC piping system in India (1999)
- First to launch lead free uPVC piping system in India (2004)
- Corp Excel- National SME Excellence Award (2006)
- First to get NSF Certification for CPVC piping system in India (2007)
- First to launch lead-free uPVC column pipes in India (2012)
- Enterprising Entrepreneur of the year (2012-13)
- Business Standard Star SME of the year (2013)
- Inc. India Innovative 100 for Smart Innovation under category of 'Technology' (2013)
- India's Most Promising Brand Award (2014)
- Value Creator Award during the first ever Fortune India Next 500 (2015)
- India's Most Trusted Pipe Brand Award (2016 & 2019)
- ET Inspiring Business Leaders of India Award (2016)
- India's Most Attractive Pipe Brand Award (2016)
- Fortune India 500 Company (2016)
- Consumer Validated Superbrands India (2017 & 2019)

SELECTED Superbrand INDIA Consumer Validated 2019

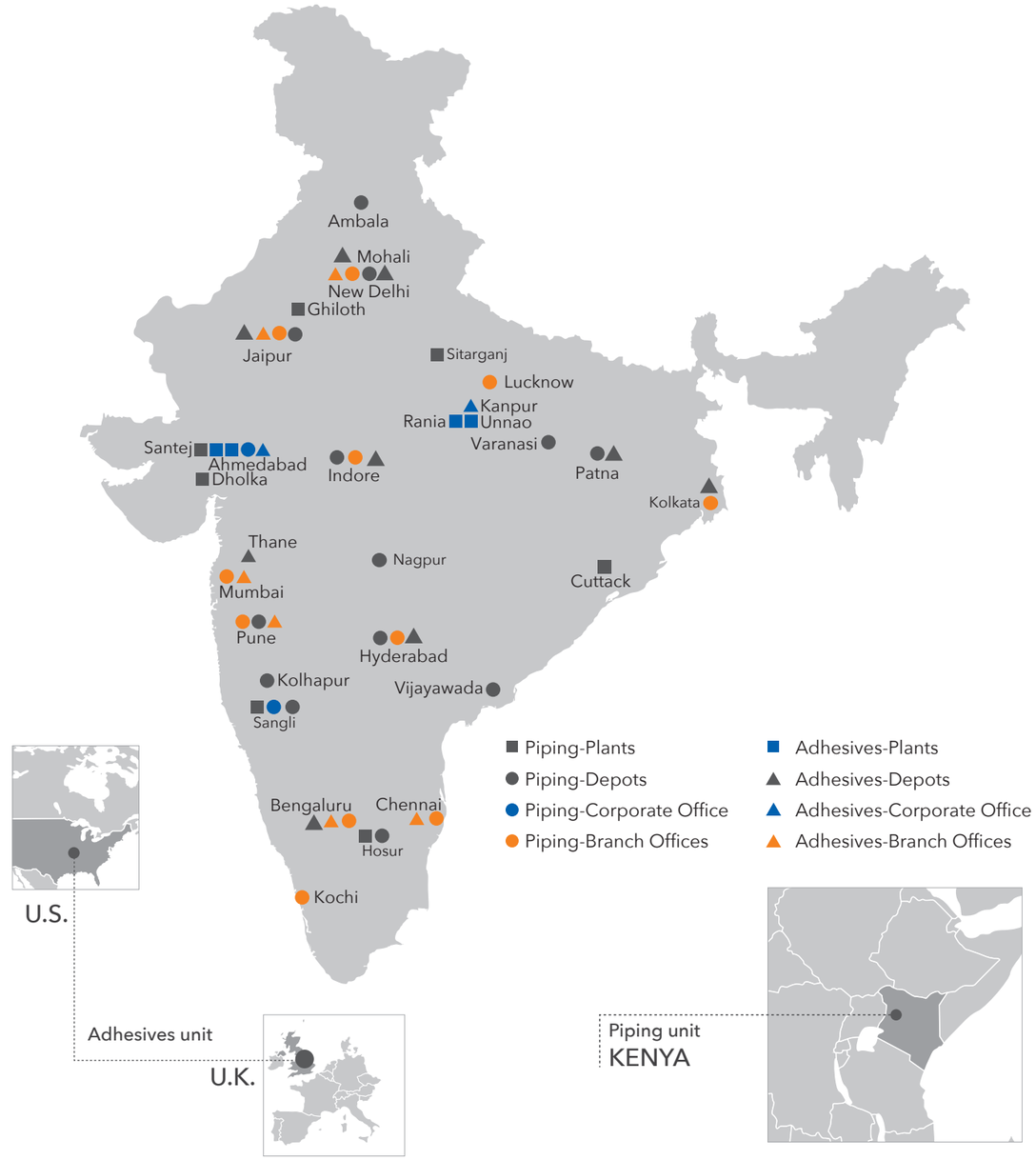
The Brand Trust Report - India Study - 2019 Power of Trust

FORTUNE INDIA 500



# **MARKETING** NETWORK

ASTRAL has a marketing network of more than 800 distributors and 30,000 dealers spread all over India with branch offices at Mumbai, Pune, Delhi, Bengaluru, Chennai, Hyderabad, Jaipur, Lucknow and Kochi. Apart from that ASTRAL has its own warehouses at Bengaluru, Vijaywada, Hyderabad, Delhi, Ghaziabad, Kolhapur, Pune, Nagpur, Indore, Varanasi, Jaipur & Hosur to deliver the material as quick as possible. More than 400 techno marketing professionals and administrative personnel are on the board to coordinate with architects, plumbing contractors and plumbers to utilize the best plumbing techniques and to get the best from the products.



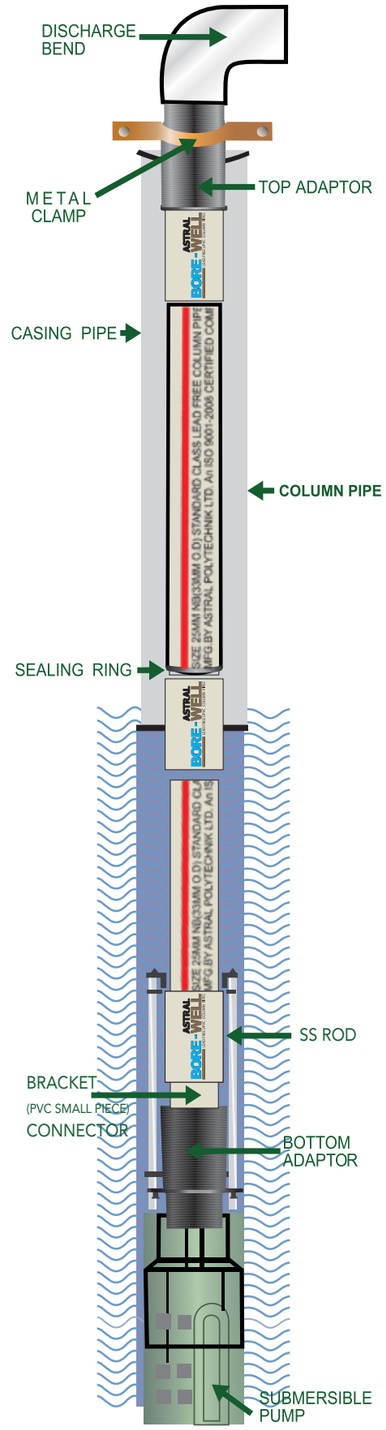

# ABOUT ASTRAL BORE-WELL® LEAD FREE UPVC COLUMN PIPES

We are proud to introduce Astral Bore-Well; the "Lead Free" and "Heavy Metal free" uPVC Column pipes in Indian Market which is 100% safe for drinking water, commercial and agricultural applications.

This 'Lead-free' attribute of ASTRAL BORE-WELL column Pipes help in delivering clean and non-toxic water from the source. ASTRAL BORE-WELL column Pipes are available in 1" (33 mm OD) to 5" (140 mm OD) with different class like V4 Bell End, V4, ECO Medium, Medium, Crystal, Standard, Heavy, Double Heavy and Super Heavy with all standard accessories like Top-Bottom Adaptor Sets, Pump Guards, Lowering Jigs etc. As the full line manufacturer of CPVC & uPVC piping system for agriculture, residential and industrial applications, ASTRAL® can be your one stop source for all the plastic piping required for lifetime piping solutions.



# COLUMN PIPES SIZES




## AVAILABLE SIZE:

| | | |
|---|---|---|
| 1" (25 mm) | : | V4 Bell End, V4, Medium Bell End, Medium, Crystal, Standard |
| 1 ¼" (32 mm) | : | V4 Bell End, V4, Medium, Crystal, Standard, Heavy, Super Heavy |
| 1 ½" (40 mm) | : | V4 Bell End, V4, Medium, Standard, Heavy, Super Heavy |
| 2" (50 mm) | : | Eco Medium, Medium, Crystal, Standard, Heavy, Super Heavy |
| 2 ¼" (50 mm) | : | Super Heavy |
| 2 ½" (65 mm) | : | Medium, Standard, Heavy, Super Heavy |
| 3" (80 mm) | : | Medium, Standard, Heavy, Super Heavy |
| 3 ½" (90 mm) | : | Double Heavy |
| 4" (100mm) | : | Medium, Standard, Heavy, Super Heavy |
| 5" (140 mm) | : | Standard, Heavy, Super Heavy |

## SHORTLY INTRODUCING:

| | | |
|---|---|---|
| 6" (165 mm) | : | Heavy |

## FIELD OF APPLICATIONS

Water rising for submersible pump, domestic and industrial applications. Ideally suitable for long term use in salty, sandy and chemically aggressive water.Color coding of pipes

| Class of Pipe | Printing Color |
|---|---|
| V4, V4 Bell End | Violet |
| Eco Medium | Violet |
| Medium | Green |
| Crystal | Orange |
| Standard | Red |
| Heavy | Blue |
| Double Heavy | Black |
| Super Heavy | Black |

# **WHY UPVC FOR**
# COLUMN PIPES?

For many years, Metal pipes have been used with submersible pumps to get the water from ground. These pipes are corroded and scaled in their life span and giving troubles to the owner in terms of quantity of water and also the pumping cost. PVC has excellent chemical and corrosion resistance to a broad range of fluids. So PVC can give trouble free service for many years. Secondly, among all thermoplastics also, PVC is the material which can be compounded and modify keeping in the mind of special characteristics required for pipes to be used with submersible pumps. This versatility is not observed with other thermoplastics like Polyethylene (PE). Hence PVC contributes to major usage as piping material globally.

### **WHY ASTRAL BOREWELL** COLUMN PIPES ?

ASTRAL BORE-WELL column pipes have been developed as a result of ASTRAL's constant endeavor to develop superior yet economical piping solution for submersible pumps. The compound has been developed at ASTRAL's R & D lab after many trials and research with the help of Japanese technology. ASTRAL's expertise in introducing better compound in Indian Market, comes handy yet another time while introducing completely Eco Friendly – lead and heavy metal free – uPVC column pipes.

The raw materials for the pipe get processed in state of the art machinery contributing to the finest pipe quality with most accurate dimensions. The Pipes then are threaded in high tech CNC machines which are very essential for better performance of column pipes. The thread geometry is designed in such a way that it gives highest strength against vertical column load as well as the pressure developed due to pump operation.

### **SQUARE** THREADS

Unique square threads made on CNC machines provide sufficient grip and additional strength against tensile load. Thus the joint becomes fairly strong with sufficient factor of safety to take care of load of entire assembly with pump weight. These specially designed threads also lead to easy fitment.

### THIN AND THICK PROCESS

The pipe ends are given special effect of additional wall thickness by using Thin & Thick process to compensate the strength and load bearing capacity caused due to threading of pipes. The effect of Thin & Thick is given to all sizes considering the working conditions & load factor.

### **EPDM** 'O' RING

Specially designed 'O' rings provided on the threads make the joints watertight and absorb pump vibrations. These rings are made from EPDM (Ethylene Propylene Diene Monomer) rubber which is the most suitable for drinking water option.

### **LEAD-FREE &** HEAVY-METAL FREE COMPOUND

ASTRAL BORE-WELL column pipes have been manufactured using Lead-free and Heavy Metal-free compound – in other words, ASTRAL BORE-WELL column pipes are completely Eco Friendly. Pipes will not pollute the ground water and will keep it safe from leaching of carcinogenic material like Lead.



### **SPECIAL** COMPOUND

ASTRAL BORE-WELL column pipes are manufactured from "HEAVY METAL FREE" uPVC compound which especially developed by using "JAPANESE TECHNOLOGY" to sustain best column loads, pressure and also can withstand the high impacts during handling, storage and installation. Due to this special compound the TENSILE property of pipe increases which is being tested rigorously using modern testing equipment.

### **DOUBLE STUD PIN** LOCKING SYSTEM

Every pipe is fitted with coupler having "Double SS Stud Pin Lock" a unique system developed by ASTRAL® which ensures that during installation, application or removal of system, the coupler will never detached from the pipe. ASTRAL® is the only company in India giving double locking system which gives highest safety and reliability of the system.

### **PIPES & COUPLERS JOINT** WITH SPECIAL COMPOUND

Apart from stud pin lock system, pipes and couplers are joined with special joining compound which makes lifetime permanent joint without affecting the thread dimensional stability in longer service life.

### **ANNEALING** ON PIPES

Every pipe is annealed during manufacturing which is a very special technique developed by ASTRAL®. This really enhances the mechanical properties of pipes making sure that the pipes will perform best during application.

### **100% HYGIENIC / SAFE** FOR DRINKING WATER

Supply of drinking water is 100% hygienic and safe as being pumped through ASTRAL uPVC Column pipes manufactured from special HEAVY METAL FREE compound right from the origin of water source beneath under the earth at maximum depth.

# LEADING THE
# LEAD-FREE PIPE MOVEMENT

Lead (Pb on the Periodic Table) is one of the most naturally occuring elements on the planet. With little or no known biological benefit to humans, Lead causes a lot of damage and leads to poisoning when imbibed.

The lead can easily leach or dissolve into the water from transportaion pipes and can be fatal. High blood lead levels in children can cause consequences which may be irreversible including learning disabilities, behavioural problems and mental retardation.

The world over, Lead-free piping is the way forward to transport potable water. Something we've been doing at Astral Pipes for over many years now. Our lead-free pipes have exceeded all quality benchmarks and continue to be one of our bestselling products.





# ADVANTAGES OF
# LEAD FREE COLUMN PIPES

Lead is a metal with no known biological benefit to humans. Too much lead can damage various systems of the body including the nerves and reproductive systems and the kidneys and it can cause high blood pressure and anemia. Lead accumulates in the bones and lead poisoning may be diagnosed from a blue line around the gums. Lead is especially harmful to the developing brains of fetuses and young children and to pregnant women. Lead interferes with the metabolism of calcium and Vitamin D. High blood lead levels in children can cause consequences which may be irreversible including learning disabilities, behavioral problems and mental retardation. At very high levels, lead can cause convulsion, coma and death. Lead can be dissolved in water when lead pipes are used for transportation of water. So use of such pipes may be harmful to human being. Hence lead free piping system is most favoured for potable water transportation.

## **EFFECTS** OF LEAD

- Exposure to lead during childhood can cause intellectual disabilities
- Lead exposure is estimated to account for 1,43,000 deaths per year
- Lead stored in bones may be remobilized into the blood during pregnancy, thus exposing the fetus
- At high levels of exposure, lead attacks the brain & central nervous system causing coma, convulsion and even death

# QUALITY CONTROL
## PROCEDURE AT ASTRAL

The pipe and couplers manufactured at Astral, follow a stringent quality control process before being rolled out to the market, in order to supply a defect free system to its users.

| | | |
|---|---|---|
| Test | : | Standard |
| Short Term Hydrostatic Pressure Test | : | As per IS:4985 |
| Impact Strength | : | As per IS:4985 Testing done at 6 to 20 times greater than specifications |
| Tensile Strength | : | As per IS:12818 |
| Joint Pressure Test | : | As per IS:12235 should be one or two times of working pressure (Depending on size) |
| Density | : | As per IS:12818 between 1.40 -1.43 g/cm$^3$ |
| Ultimate Breaking Load on Complete Assembly | : | As Per ASTRAL SPECIFICATION |
| Flattening Test | : | As per IS:12235 |
| Izod Impact Test | : | As per ASTM D256 |
| Resistance to Dichloromethane | : | As per IS:12235 |
| Adequacy of Fusion of Extruded Pipe | : | As per ASTM D2152 |

# COMPARISON WITH
## OTHER MATERIALS

ASTRAL BORE-WELL uPVC column pipes are perfect replacement to conventional Galvanized Iron pipes used in bore wells and hold several critical advantages over conventional Mild steel or Galvanized Iron pipes, as well as HDPE Pipes also which are

| Property Requirement for Column Pipes | ASTRAL BORE-WELL uPVC COLUMN Pipes | Mild Steel or Galvanized Iron Pipes | HDPE Pipes |
|---|---|---|---|
| **Long life** | ASTRAL BORE-WELL uPVC Column pipes do not react with acidic or alkaline water and have a long life in the bore wells. | MS/GI pipes are prone to rust, corrosion & ultimately get damaged and need to bere placed quickly. | Strength of material very less, so thick pipes are required for high pressure application, reducing the internal area for water flow considerably. |
| **Light weight** | Pipes are Light in weight and are easy to handle, install and remove. | Pipes are heavy and a great effort is required for installation or maintenance. Difficult to handle. | Becomes hard and cannot be rolled back during removal. Pulling with tractor disturbs the crop. |
| **Smooth Internal Surface** | Internal surface is smooth, so low head loss due to friction & results in higher discharge of water. | Rough internal surface and head loss is high resulting in less discharge of water. | Internal surface not as smooth as Astral Pipes. |
| **Power Saver** | As the friction losses are less, the pump require less power to lift the water. Resulting in power saving. | Friction losses are high. So pump requires more power to discharge the water for the same head. Results in more power consumption. | Comparatively less power saver than uPVC column pipes. |
| **Leak proof joints** | Rubber seals are provided with the thread at every joint ensuring 100% leak proof. | Not pressure tight, No rubber seal & hence NOT Leak proof. | Threads are weak and open up during use. |
| **Strong threaded joints** | Specially designed square Threads, which DO NOT corrode, rust or deteriorate. | Threads are prone to rust and corrosion easily. | The threads cannot be formed and therefore the jointing of the pipe with the pump or at the top with any fixture is simple push type joint. |



# ACCESSORIES

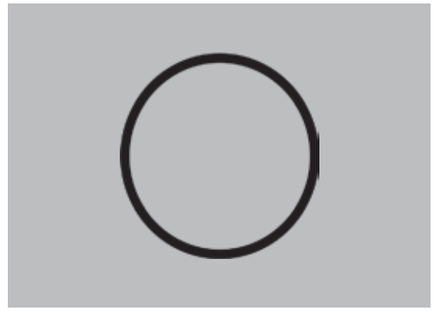
### uPVC COLUMN PIPE 1" to 5"

- Eco Medium
- V4 Bell End
- V4
- Medium Bell End
- Medium
- Crystal
- Standard
- Heavy
- Double Heavy
- Super Heavy

### TOP & BOTTOM ADAPTOR SET 1" TO 5" CI & SS BOTH

### SIGRI (LOWERING JIG) 1" TO 5"

### 'O' RING 1" TO 5" ALL SIZE



### PUMP GUARD SET 1" TO 5"

# LEAD-FREE uPVC COLUMN PIPES
## FOR SUBMERSIBLE PUMP

**3 MTR. PIPE**
OD: 33 mm
NB: 25 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 2.5 | 1 | V4 | Bell End | M071260303 | 12.5 | 25 | Violet |
| 2.5 | 1 | V4 | Coupler | M071110303 | 12.5 | 25 | Violet |
| 2.5 | 1 | Medium | Bell End | M071330303 | 15 | 25 | Green |
| 2.5 | 1 | Medium | Coupler | M071120303 | 16 | 25 | Green |
| 2.5 | 1 | Crystal | Coupler | M071300303 | 21 | 25 | Orange |
| 2.5 | 1 | Standard | Coupler | M071130303 | 30 | 25 | Red |

**3 MTR. PIPE**
OD: 42 mm
NB: 32 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 3.2 | 1¼ | V4 | Bell End | M071260304 | 12.5 | 25 | Violet |
| 3.2 | 1¼ | V4 | Coupler | M071110304 | 12.5 | 25 | Violet |
| 3.2 | 1¼ | Medium | Bell End | M071330304 | 15 | 25 | Green |
| 3.2 | 1¼ | Medium | Coupler | M071120304 | 15 | 25 | Green |
| 3.2 | 1¼ | Crystal | Coupler | M071300304 | 21 | 25 | Orange |
| 3.2 | 1¼ | Standard | Coupler | M071130304 | 25 | 20 | Red |
| 3.2 | 1¼ | Heavy | Coupler | M071140304 | 35 | 15 | Blue |
| 3.2 | 1¼ | *Super Heavy | Coupler | M071150304 | 40 | 15 | Black |

**3 MTR. PIPE**
OD: 48 mm
NB: 40 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 4.0 | 1½ | V4 | Bell End | M071260305 | 12.5 | 25 | Violet |
| 4.0 | 1½ | V4 | Coupler | M071110305 | 12.5 | 25 | Violet |
| 4.0 | 1½ | Medium | Coupler | M071120305 | 15 | 25 | Green |
| 4.0 | 1½ | Crystal | Coupler | M071300305 | 21 | 20 | Orange |
| 4.0 | 1½ | Standard | Coupler | M071130305 | 26 | 20 | Red |
| 4.0 | 1½ | Heavy | Coupler | M071140305 | 35 | 15 | Blue |
| 4.0 | 1½ | *Super Heavy | Coupler | M071150305 | 40 | 15 | Black |

**3 MTR. PIPE**
OD: 60 mm
NB: 50 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 5.0 | 2 | Eco Medium | Coupler | M071110306 | 8 | 15 | Violet |
| 5.0 | 2 | Eco Medium Plus | Coupler | M071430306 | 10 | 15 | Brown |
| 5.0 | 2 | Medium | Coupler | M071120306 | 13 | 15 | Green |
| 5.0 | 2 | Crystal | Coupler | M071300306 | 17 | 15 | Orange |
| 5.0 | 2 | Standard | Coupler | M071130306 | 20 | 15 | Red |
| 5.0 | 2 | Heavy | Coupler | M071140306 | 27 | 10 | Blue |
| 5.0 | 2 | *Super Heavy | Coupler | M071150306 | 35 | 10 | Black |

**3 MTR. PIPE**
OD: 63 mm
NB: 50 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 5.0+ | 2¼ | *Super Heavy | Coupler | M071150314 | 35 | 07 | Black |

* Pipes need to install with super heavy adaptor set only



# TECHNICAL CHART
## FOR ASTRAL BORE-WELL COLUMN PIPES

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 2.5 | 1 | V4 Bell End (12.5 kgf/cm²) | 3.30 | 3.81 | 1.60 | 2.11 | 33.0 ± 0.10 | 150-150 | 3000 (+10) | 800 | 400 | 12.5 | 125 |
| 2.5 | 1 | V4 (12.5 kgf/cm²) | 3.30 | 3.81 | 1.60 | 2.11 | | 150-150 | 3000 (+10) | 800 | 400 | 12.5 | 125 |
| 2.5 | 1 | Medium Bell End (15 kgf/cm²) | 3.70 | 4.21 | 1.90 | 2.41 | | 170-170 | 3000 (+10) | 1050 | 620 | 15 | 150 |
| 2.5 | 1 | Medium (16 kgf/cm²) | 3.90 | 4.41 | 1.90 | 2.41 | | 170-170 | 3000 (+10) | 1050 | 620 | 16 | 160 |
| 2.5 | 1 | Crystal (21 kgf/cm²) | 3.60 | 4.11 | 2.50 | 3.01 | | 170-170 | 3000 (+10) | 1250 | 740 | 21 | 210 |
| 2.5 | 1 | Standard (30 kgf/cm²) | 5.00 | 5.61 | 3.20 | 3.71 | | 170-170 | 3000 (+10) | 1700 | 1250 | 30 | 300 |

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 3.2 | 1¼ | V4 Bell End (12.5 kgf/cm²) | 4.10 | 4.61 | 1.90 | 2.40 | 42.0 ± 0.10 | 150-150 | 3000 (+10) | 1300 | 740 | 12.5 | 125 |
| 3.2 | 1¼ | V4 (12.5 kgf/cm²) | 4.10 | 4.61 | 1.90 | 2.40 | | 150-150 | 3000 (+10) | 1300 | 740 | 12.5 | 125 |
| 3.2 | 1¼ | Medium Bell End (15 kgf/cm²) | 4.50 | 5.00 | 2.30 | 2.80 | | 170-170 | 3000 (+10) | 1550 | 900 | 15 | 150 |
| 3.2 | 1¼ | Medium (15 kgf/cm²) | 4.50 | 5.00 | 2.30 | 2.80 | | 170-170 | 3000 (+10) | 1550 | 900 | 15 | 150 |
| 3.2 | 1¼ | Crystal (21 kgf/cm²) | 5.20 | 5.81 | 2.90 | 3.41 | | 170-170 | 3000 (+10) | 2100 | 1210 | 21 | 210 |
| 3.2 | 1¼ | Standard (25 kgf/cm²) | 6.30 | 7.01 | 4.10 | 4.71 | | 170-170 | 3000 (+10) | 2600 | 1500 | 25 | 250 |
| 3.2 | 1¼ | Heavy (35 kgf/cm²) | 6.50 | 7.29 | 4.70 | 5.31 | | 170-170 | 3000 (+10) | 3100 | 1550 | 35 | 350 |
| 3.2 | 1¼ | Super Heavy (40 kgf/cm²) | 7.60 | 8.59 | 5.50 | 6.16 | | 250-250 | 3000 (+10) | 3150 | 1850 | 40 | 400 |

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 4.0 | 1½ | V4 Bell End (12.5 kgf/cm²) | 4.10 | 4.60 | 2.20 | 2.70 | 48.0 ± 0.10 | 150-150 | 3000 (+10) | 1700 | 970 | 12.5 | 125 |
| 4.0 | 1½ | V4 (12.5 kgf/cm²) | 4.10 | 4.60 | 2.20 | 2.70 | | 150-150 | 3000 (+10) | 1700 | 970 | 12.5 | 125 |
| 4.0 | 1½ | Medium (15 kgf/cm²) | 4.65 | 5.15 | 2.65 | 3.15 | | 170-170 | 3000 (+10) | 2000 | 1250 | 15 | 150 |
| 4.0 | 1½ | Crystal (21 kgf/cm²) | 5.20 | 5.70 | 3.50 | 4.00 | | 170-170 | 3000 (+10) | 2400 | 1500 | 21 | 210 |
| 4.0 | 1½ | Standard (26 kgf/cm²) | 6.10 | 6.81 | 4.00 | 4.61 | | 170-170 | 3000 (+10) | 3000 | 1700 | 26 | 260 |
| 4.0 | 1½ | Heavy (35 kgf/cm²) | 7.40 | 8.39 | 5.20 | 5.81 | | 170-170 | 3000 (+10) | 4000 | 2000 | 35 | 350 |
| 4.0 | 1½ | Super Heavy (40 kgf/cm²) | 8.50 | 9.62 | 6.00 | 6.71 | | 250-250 | 3000 (+10) | 4100 | 2350 | 40 | 400 |

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 5.0 | 2 | Eco Medium (8 kgf/cm²) | 4.00 | 4.51 | 1.90 | 2.41 | 60.0 ± 0.13 | 150-150 | 3000 (+10) | 2150 | 1180 | 8 | 80 |
| 5.0 | 2 | Eco Medium Plus (10 kgf/cm²) | 4.20 | 4.71 | 2.10 | 2.61 | | 150-150 | 3000 (+10) | 2250 | 1225 | 10 | 100 |
| 5.0 | 2 | Medium (13 kgf/cm²) | 5.20 | 5.86 | 2.60 | 3.11 | | 200-200 | 3000 (+10) | 2900 | 1550 | 13 | 130 |
| 5.0 | 2 | Crystal (17 kgf/cm²) | 5.60 | 6.28 | 3.40 | 3.91 | | 200-200 | 3000 (+10) | 3200 | 1870 | 17 | 170 |
| 5.0 | 2 | Standard (20 kgf/cm²) | 6.40 | 7.19 | 3.90 | 4.41 | | 200-200 | 3000 (+10) | 3800 | 2100 | 20 | 200 |
| 5.0 | 2 | Heavy (27 kgf/cm²) | 7.80 | 8.79 | 5.30 | 5.96 | | 200-200 | 3000 (+10) | 5000 | 3030 | 27 | 270 |
| 5.0 | 2 | Super Heavy (35 kgf/cm²) | 9.30 | 10.42 | 6.80 | 7.66 | | 250-250 | 3000 (+10) | 5600 | 3500 | 35 | 350 |

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 5.0+ | 2¼ | Super Heavy (35 kgf/cm²) | 8.70 | 9.82 | 6.40 | 7.19 | 62.85 ± 0.15 | 250-250 | 3000 (+10) | 7600 | 4200 | 35 | 350 |

# LEAD-FREE uPVC COLUMN PIPES
## FOR SUBMERSIBLE PUMP

**3 MTR. PIPE**
OD: 75 mm
NB: 65 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 6.5 | 2½ | Medium | Coupler | M071120307 | 10 | 10 | Green |
| 6.5 | 2½ | Standard | Coupler | M071130307 | 16 | 10 | Red |
| 6.5 | 2½ | Standard Plus | Coupler | M071440307 | 21 | 10 | Brown |
| 6.5 | 2½ | Heavy | Coupler | M071140307 | 26 | 07 | Blue |
| 6.5 | 2½ | *Super Heavy | Coupler | M071150307 | 35 | 05 | Black |

**3 MTR. PIPE**
OD: 88 mm
NB: 80 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 8.0 | 3 | Medium | Coupler | M071120308 | 11 | 07 | Green |
| 8.0 | 3 | Standard | Coupler | M071130308 | 17 | 05 | Red |
| 8.0 | 3 | Standard Plus | Coupler | M071440308 | 21 | 05 | Brown |
| 8.0 | 3 | Heavy | Coupler | M071140308 | 26 | 05 | Blue |
| 8.0 | 3 | *Super Heavy | Coupler | M071150308 | 35 | 05 | Black |

**3 MTR. PIPE**
OD: 104 mm
NB: 90 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 9.0 | 3½ | *Double Heavy | Coupler | M071150315 | 32 | 03 | Black |

**3 MTR. PIPE**
OD: 113 mm
NB: 100 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 10.0 | 4 | Medium | Coupler | M071120309 | 10 | 05 | Green |
| 10.0 | 4 | Standard | Coupler | M071130309 | 15 | 05 | Red |
| 10.0 | 4 | Standard Plus | Coupler | M071440309 | 21 | 05 | Brown |
| 10.0 | 4 | Heavy | Coupler | M071140309 | 26 | 03 | Blue |
| 10.0 | 4 | *Super Heavy | Coupler | M071150309 | 35 | 03 | Black |

**3 MTR. PIPE**
OD: 140 mm
NB: 125 mm

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 12.5 | 5 | Standard | Coupler | M071130316 | 16 | 02 | Red |
| 12.5 | 5 | *Heavy | Coupler | M071140316 | 26 | 02 | Blue |
| 12.5 | 5 | *Super Heavy | Coupler | M071150316 | 35 | 02 | Black |

* Pipes need to install with super heavy adaptor set only



# TECHNICAL CHART
## FOR ASTRAL BORE-WELL COLUMN PIPES

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 6.5 | 2½ | Medium (10 kgf/cm²) | 4.60 | 5.21 | 2.70 | 3.21 | 75.2 ± 0.13 | 200-200 | 3000 (+10) | 3550 | 1930 | 10 | 100 |
| 6.5 | 2½ | Standard (16 kgf/cm²) | 6.50 | 7.29 | 4.10 | 4.61 | | 200-200 | 3000 (+10) | 5300 | 2860 | 16 | 160 |
| 6.5 | 2½ | Standard Plus (21 kgf/cm²) | 7.60 | 8.59 | 5.10 | 5.71 | | 200-200 | 3000 (+10) | 5900 | 3500 | 21 | 210 |
| 6.5 | 2½ | Heavy (26 kgf/cm²) | 9.00 | 10.12 | 6.50 | 7.29 | | 200-200 | 3000 (+10) | 7000 | 4200 | 26 | 260 |
| 6.5 | 2½ | Super Heavy (35 kgf/cm²) | 10.80 | 12.15 | 8.60 | 9.72 | | 250-250 | 3000 (+10) | 8600 | 4800 | 35 | 350 |

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 8.0 | 3 | Medium (11 kgf/cm²) | 5.70 | 6.38 | 3.20 | 3.71 | 88.0 ± 0.15 | 200-200 | 3000 (+10) | 4500 | 2500 | 11 | 110 |
| 8.0 | 3 | Standard (17 kgf/cm²) | 7.00 | 7.86 | 5.00 | 5.61 | | 200-200 | 3000 (+10) | 7200 | 4110 | 17 | 170 |
| 8.0 | 3 | Standard Plus (21 kgf/cm²) | 8.00 | 8.99 | 6.30 | 7.09 | | 200-200 | 3000 (+10) | 8200 | 4850 | 21 | 210 |
| 8.0 | 3 | Heavy (26 kgf/cm²) | 10.00 | 11.24 | 7.50 | 8.49 | | 200-200 | 3000 (+10) | 10600 | 6350 | 26 | 260 |
| 8.0 | 3 | Super Heavy (35 kgf/cm²) | 12.20 | 13.72 | 9.70 | 10.94 | | 250-250 | 3000 (+10) | 11900 | 6600 | 35 | 350 |

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 9.0 | 3½ | Double Heavy (32 kgf/cm²) | 14.0 | 15.7 | 10.5 | 11.85 | 104.0 ± 0.15 | 250-250 | 3000 (+10) | 14100 | 7900 | 32 | 320 |

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 10.0 | 4 | Medium (10 kgf/cm²) | 6.50 | 7.29 | 4.00 | 4.51 | 113.0 ± 0.15 | 200-200 | 3000 (+10) | 7500 | 4100 | 10 | 100 |
| 10.0 | 4 | Standard (15 kgf/cm²) | 7.70 | 8.69 | 5.70 | 6.38 | | 250-250 | 3000 (+10) | 10500 | 5800 | 15 | 150 |
| 10.0 | 4 | Standard Plus (21 kgf/cm²) | 10.20 | 11.44 | 7.60 | 8.59 | | 250-250 | 3000 (+10) | 13000 | 7650 | 21 | 210 |
| 10.0 | 4 | Heavy (26 kgf/cm²) | 11.50 | 13.02 | 9.50 | 10.74 | | 250-250 | 3000 (+10) | 16000 | 9500 | 26 | 260 |
| 10.0 | 4 | Super Heavy (35 kgf/cm²) | 15.50 | 17.58 | 13.00 | 14.70 | | 250-250 | 3000 (+10) | 19800 | 11000 | 35 | 350 |

| Nominal Dia (cm) | Nominal Size (inch) | Type | Wall Thickness (mm) | | | | Average Outside Diameter (OD) (mm) | Length of Thick Portion at Both Side (mm) | Nominal Effective Length (tolerance) (mm) | Ultimate Breaking Load (kg) | Safe Pulling Load with Chain Pulley (kg) | Safe Allowable Hydrostatic Pressure (kgf/cm²) | Safe Total Pump Delivery Head (mtr.) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Side | | Middle/Barrel Side | | | | | | | | |
| | | | Min | Max | Min | Max | | | | | | | |
| 12.5 | 5 | Standard (16 kgf/cm²) | 10.40 | 11.75 | 7.80 | 8.79 | 140.0 ± 0.20 | 250-250 | 3000 (+10) | 16400 | 9650 | 16 | 160 |
| 12.5 | 5 | Heavy (26 kgf/cm²) | 15.60 | 17.68 | 12.50 | 14.02 | | 250-250 | 3000 (+10) | 24200 | 14600 | 26 | 260 |
| 12.5 | 5 | Super Heavy (35 kgf/cm²) | 19.20 | 21.49 | 15.60 | 17.68 | | 250-250 | 3000 (+10) | 30500 | 18600 | 35 | 350 |

# LEAD-FREE uPVC COLUMN PIPES
## FOR SUBMERSIBLE PUMP

**1.5 MTR. PIPE**

| Nominal Dia (cm) | Nominal Size (inch) | Class | Type | Product Code | Pressure (kgf/cm²) | Std. Pkg. (Nos.) | Stripe Colour |
|---|---|---|---|---|---|---|---|
| 2.5 | 1 | V4 | Coupler | M071111503 | 12.5 | 25 | Violet |
| 3.2 | 1¼ | V4 | Coupler | M071111504 | 12.5 | 25 | Violet |
| 4.0 | 1½ | Standard | Coupler | M071131505 | 26.0 | 20 | Red |
| 5.0 | 2 | Standard | Coupler | M071131506 | 20.0 | 15 | Red |
| 6.5 | 2½ | Standard | Coupler | M071131507 | 16.0 | 10 | Red |
| 8.0 | 3 | Standard | Coupler | M071131508 | 17.0 | 05 | Red |
| 10.0 | 4 | Standard | Coupler | M071131509 | 15.0 | 05 | Red |

# ACCESSORIES
## FOR BORE-WELL PIPES

**uPVC REGULAR SMALL PC**

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | M071230003 |
| 3.2 | 1¼ | M071230004 |
| 4.0 | 1½ | M071230005 |
| 5.0 | 2 | M071230006 |
| 6.5 | 2½ | M071230007 |
| 8.0 | 3 | M071230008 |
| 10.0 | 4 | M071230009 |

**uPVC SUPER HEAVY SMALL PC**

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 3.2 | 1¼ | M071240004 |
| 4.0 | 1½ | M071240005 |
| 5.0 | 2 | M071240006 |
| 50+ | 2¼ | M071240014 |
| 6.5 | 2½ | M071240007 |
| 8.0 | 3 | M071240008 |
| 9.0 | 3½ | M071240015 |
| 10.0 | 4 | M071240009 |



# ACCESSORIES
## FOR BORE-WELL PIPES

**CI TOP ADAPTOR WITH FLANGE (SINGLE CLAMP)**

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | TA-1-CI |
| 3.2 | 1¼ | TA-114-CI |
| 4.0 | 1½ | TA-112-CI |
| 5.0 | 2 | TA-2-CI |
| 6.5 | 2½ | TA-212-CI |
| 8.0 | 3 | TA-3-CI |
| 10.0 | 4 | TA-4-CI |

**CI TOP ADAPTOR WITH FLANGE (DOUBLE CLAMP)**

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | TA-1-H-CI |
| 3.2 | 1¼ | TA-114-H-CI |
| 4.0 | 1½ | TA-112-H-CI |
| 5.0 | 2 | TA-2-H-CI |
| 6.5 | 2½ | TA-212-H-CI |
| 8.0 | 3 | TA-3-H-CI |
| 10.0 | 4 | TA-4-H-CI |

**MS SUPER HEAVY TOP ADAPTOR (DOUBLE CLAMP)**

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 3.2 | 1¼ | TA-114-SH-MS |
| 4.0 | 1½ | TA-112-SH-MS |
| 5.0 | 2 | TA-2-SH-MS |
| 5.0+ x 5.0 | 2¼x2 | TA-214-SH-MS |
| 6.5 | 2½ | TA-212-SH-MS |
| 8.0 | 3 | TA-3-SH-MS |
| 9.0 | 3½ | TA-312-SH-MS |
| 10.0 | 4 | TA-4-SH-MS |

**SS 304 SUPER HEAVY TOP ADAPTOR (DOUBLE CLAMP)**

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 3.2 | 1¼ | TA-114-SH-SS304 |
| 4.0 | 1½ | TA-112-SH-SS304 |
| 5.0 | 2 | TA-2-SH-SS304 |
| 5.0+ x 5.0 | 2¼x2 | TA-214-SH-SS304 |
| 6.5 | 2½ | TA-212-SH-SS304 |
| 8.0 | 3 | TA-3-SH-SS304 |
| 9.0 | 3½ | TA-312-SH-SS304 |
| 10.0 | 4 | TA-4-SH-SS304 |

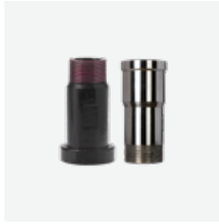
# ACCESSORIES
## FOR BORE-WELL PIPES

### CI BOTTOM ADAPTOR (SMALL)

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | BA-1-CI |
| 3.2 | 1¼ | BA-114-CI |
| 4.0 | 1½ | BA-112-CI |
| 5.0 | 2 | BA-2-CI |
| 6.5 | 2½ | BA-212-CI |
| 8.0 | 3 | BA-3-CI |
| 10.0 | 4 | BA-4-CI |

### RUBBER 'O' RING

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | RM06610001 |
| 3.2 | 1¼ | RM06610114 |
| 4.0 | 1½ | RM06610112 |
| 5.0 | 2 | RM06610002 |
| 5.0+ | 2¼ | RM06610214 |
| 6.5 | 2½ | RM06610212 |
| 8.0 | 3 | RM06610003 |
| 9.0 | 3½ | RM06610312 |
| 10.0 | 4 | RM06610004 |



### (CI & SS) REDUCER BOTTOM ADAPTOR

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 3.2 x 2.5 | 1¼ x 1 | BAR-114-100-CI |
| 4.0 x 2.5 | 1½ x 1 | BAR-112-100-CI |
| 4.0 x 3.2 | 1½ x 1¼ | BAR-112-114-CI |
| 5.0 x 4.0 | 2 x 1½ | BAR-200-112-CI |
| 6.5 x 5.0 | 2½ x 2 | BAR-212-200-CI |
| 8.0 x6.5 | 3 x 2½ | BAR-300-212-CI |
| 10.0 x 8.0 | 4 x 3 | BAR-400-300-CI |
| 12.5 x 10.0 | 5x4 | BAR-500-400-CI |
| 4.0 x 3.2 | 1½ x 1¼ | BAR-112-114-SS |
| 5.0 x 4.0 | 2 x 1½ | BAR-200-112-SS |
| 6.5 x 5.0 | 2½ x 2 | BAR-212-200-SS |
| 8.0 x 6.5 | 3 x 2½ | BAR-300-212-SS |

### SS 304 BOTTOM ADAPTOR (LONG)

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | BA-1-H-SS304 |
| 3.2 | 1¼ | BA-114-H-SS304 |
| 4.0 | 1½ | BA-112-H-SS304 |
| 5.0 | 2 | BA-2-H-SS304 |
| 6.5 | 2½ | BA-212-H-SS304 |
| 8.0 | 3 | BA-3-H-SS304 |
| 10.0 | 4 | BA-4-H-SS304 |

### SS 304 SUPER HEAVY BOTTOM ADAPTOR

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 3.2 | 1¼ | BA-114-SH-SS304 |
| 4.0 | 1½ | BA-112-SH-SS304 |
| 5.0 | 2 | BA-2-SH-SS304 |
| 5.0 x 5.0+ | 2x2¼ | BA-214-SH-SS304 |
| 6.5 | 2½ | BA-212-SH-SS304 |
| 8.0 | 3 | BA-3-SH-SS304 |
| 9.0 | 3½ | BA-312-SH-SS304 |
| 10.0 | 4 | BA-4-SH-SS304 |

### SS 304 TOP ADAPTOR WITH FLANGE (DOUBLE CLAMP)

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | TA-1-H-SS304 |
| 3.2 | 1¼ | TA-114-H-SS304 |
| 4.0 | 1½ | TA-112-H-SS304 |
| 5.0 | 2 | TA-2-H-SS304 |
| 6.5 | 2½ | TA-212-H-SS304 |
| 8.0 | 3 | TA-3-H-SS304 |
| 10.0 | 4 | TA-4-H-SS304 |

### MS FLANGE

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | FNG-1-MS |
| 3.2 | 1¼ | FNG-114-MS |
| 4.0 | 1½ | FNG-112-MS |
| 5.0 | 2 | FNG-2-MS |
| 5.0+ | 2¼ | FNG-214-MS |
| 6.5 | 2½ | FNG-212-MS |
| 8.0 | 3 | FNG-3-MS |
| 10.0 | 4 | FNG-4-MS |

### (CI & SS) EXPANDER BOTTOM ADAPTOR

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 x 3.2 | 1 x 1¼ | BAE-100-114-CI |
| 3.2 x 4.0 | 1¼ x 1½ | BAE-114-112-CI |
| 4.0 x 5.0 | 1½ x 2 | BAE-112-200-CI |
| 5.0 x 6.5 | 2 x 2½ | BAE-200-212-CI |
| 6.5 x 8.0 | 2½ x 3 | BAE-212-300-CI |
| 8.0 x 10.0 | 3 x 4 | BAE-300-400-CI |
| 3.2 x 4.0 | 1¼ x 1½ | BAE-114-112-SS |
| 4.0 x 5.0 | 1½ x 2 | BAE-112-200-SS |
| 5.0 x 6.5 | 2 x 2½ | BAE-200-212-SS |
| 8.0 x 10.0 | 3 x 4 | BAE-300-400-SS |
| 8.0 x 10.0 | 3 x 4 | BAE-300-400-SH-SS |

# ACCESSORIES
## FOR BORE-WELL PIPES

### SS FLANGE

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 3.2 | 1¼ | FNG-114-SS |
| 4.0 | 1½ | FNG-112-SS |
| 5.0 | 2 | FNG-2-SS |
| 5.0+ | 2¼ | FNG-214-SS |
| 6.5 | 2½ | FNG-212-SS |
| 8.0 | 3 | FNG-3-SS |
| 9.0 | 3½ | FNG-3-SS |
| 10.0 | 4 | FNG-4-SS |

### SIGRI - LOWERING JIG

| Nominal Dia (cm) | Nominal Size (inch) | Product Code |
|---|---|---|
| 2.5 | 1 | LC-1-MS |
| 3.2 | 1¼ | LC-114-MS |
| 4.0 | 1½ | LC-112-MS |
| 5.0 | 2 | LC-2-MS |
| 5.0+ | 2¼ | LC-214-MS |
| 6.5 | 2½ | LC-212-MS |
| 8.0 | 3 | LC-3-MS |
| 10.0 | 4 | LC-4-MS |

### BELT SPANNER

| Size (cm) | Size (inch) | Product Code |
|---|---|---|
| 2.5 to 12.5 | 1 to 5 | BS-3-MS-D |

### SS ROD

| Size (cm) | Size (in.) | Product Code | Description Regular | Description S. Heavy |
|---|---|---|---|---|
| 48.2 | 19 | BLT-19-SS | 1", 1¼", 1½" | - |
| 50.8 | 20 | BLT-20-SS | 2", 2½", 3" | 1¼", 1½" |
| 55.8 | 22 | BLT-22-SS | - | 2,2¼", 2½" |
| 60.9 | 24 | BLT-24-SS | 4" | 2",2¼", 2½" 3", 3½", 4" |

### ALL ACCESSORIES STANDARD PACKING

| Nominal Dia (cm) | Nominal Size (inch) | Single Top or Bottom | Top/Bottom Set |
|---|---|---|---|
| 2.5 | 1 | 40 | 20 |
| 3.2 | 1¼ | 30 | 15 |
| 4.0 | 1½ | 30 | 15 |
| 5.0 | 2 | 16 | 08 |
| 5.0+ | 2¼ | 12 | 06 |
| 6.5 | 2½ | 12 | 06 |
| 8.0 | 3 | 08 | 04 |
| 9.0 | 3½ | 08 | 04 |
| 10.0 | 4 | 06 | 03 |
| 12.5 | 5 | 04 | 02 |

### 5" COLUMN PIPE ACCESSORY (STANDARD)

| Nominal Dia (cm) | Nominal Size (inch) | Product Code | HSN CODE | Description |
|---|---|---|---|---|
| 12.5 | 5 | BA-5-H-CI | 7307 | C.I. Bottom Adaptor (Long) |
| 12.5 | 5 | TA-5-H-CI | 7307 | CI Top Adaptor with Flange (Double Clamp) |
| 12.5 | 5 | BA-5-H-SS304 | 7307 | SS 304 Bottom Adaptor (Long) |
| 12.5 | 5 | TA-5-H-SS304 | 7307 | SS 304 Top Adaptor with Flange (Double Clamp) |
| 12.5 | 5 | M071380016 | 3917 | uPVC Regular Small Pc |
| 12.5 | 5 | FNG-5-SS | 7307 | SS Flange |
| 12.5 | 5 | RM06610005 | 4016 | Rubber 'O' Ring |
| 12.5 | 5 | BLT-27-SS | 7307 | SS Rod |
| 12.5 | 5 | LC-5-MS | 7307 | Sigri - Lowering Jig |

### 5" COLUMN PIPE ACCESSORY (HEAVY/ SUPER HEAVY)

| Nominal Dia (cm) | Nominal Size (inch) | Product Code | HSN CODE | Description |
|---|---|---|---|---|
| 12.5 | 5 | BA-5-SH-SS304 | 7307 | SS 304 Super Heavy Bottom Adaptor |
| 12.5 | 5 | TA-5-SH-MS | 7307 | MS Super Heavy Top Adaptor (Double Clamp) |
| 12.5 | 5 | TA-5-SH-SS304 | 7307 | SS 304 Super Heavy Top Adaptor (Double Clamp) |
| 12.5 | 5 | M071240016 | 3917 | uPVC Super Heavy Small Pc |
| 12.5 | 5 | FNG-5-SS | 7307 | SS Flange |
| 12.5 | 5 | RM06610005 | 4016 | Rubber 'O' Ring |
| 12.5 | 5 | BLT-27-SS | 7307 | SS Rod |
| 12.5 | 5 | LC-5-MS | 7307 | Sigri - Lowering Jig |

# **INSTALLATION** PROCEDURES


**1. INSERT** MS FLANGE

Insert one MS Flange to Bottom Adaptor from bottom side.


**2. FIX THE** ADAPTOR

Fix the Adaptor to Pump with wrench support tightly.


**3. WASH WITH WASHING POWDER** & CLEAN WATER

Wash PVC Small Piece male and female Threads with washing powder water and clean water and insert in Adaptor Square Threads.


**4. CONNECT FLANGES** WITH SS RODS

Place 2nd MS Flange on top of PVC Small Piece coupler and connect both Flanges with SS RODS.


**5. INSERT** PIPES

Clean the male and female Threads with washing powder water and clean water and insert pipe to pipe till last pipe.


**6. FIX WITH** PUMPS

Drop the pump with one after another pipe with a support of LOWERING JIG / ELEVATOR and manpower.


**7. FIX WINDING** WIRE

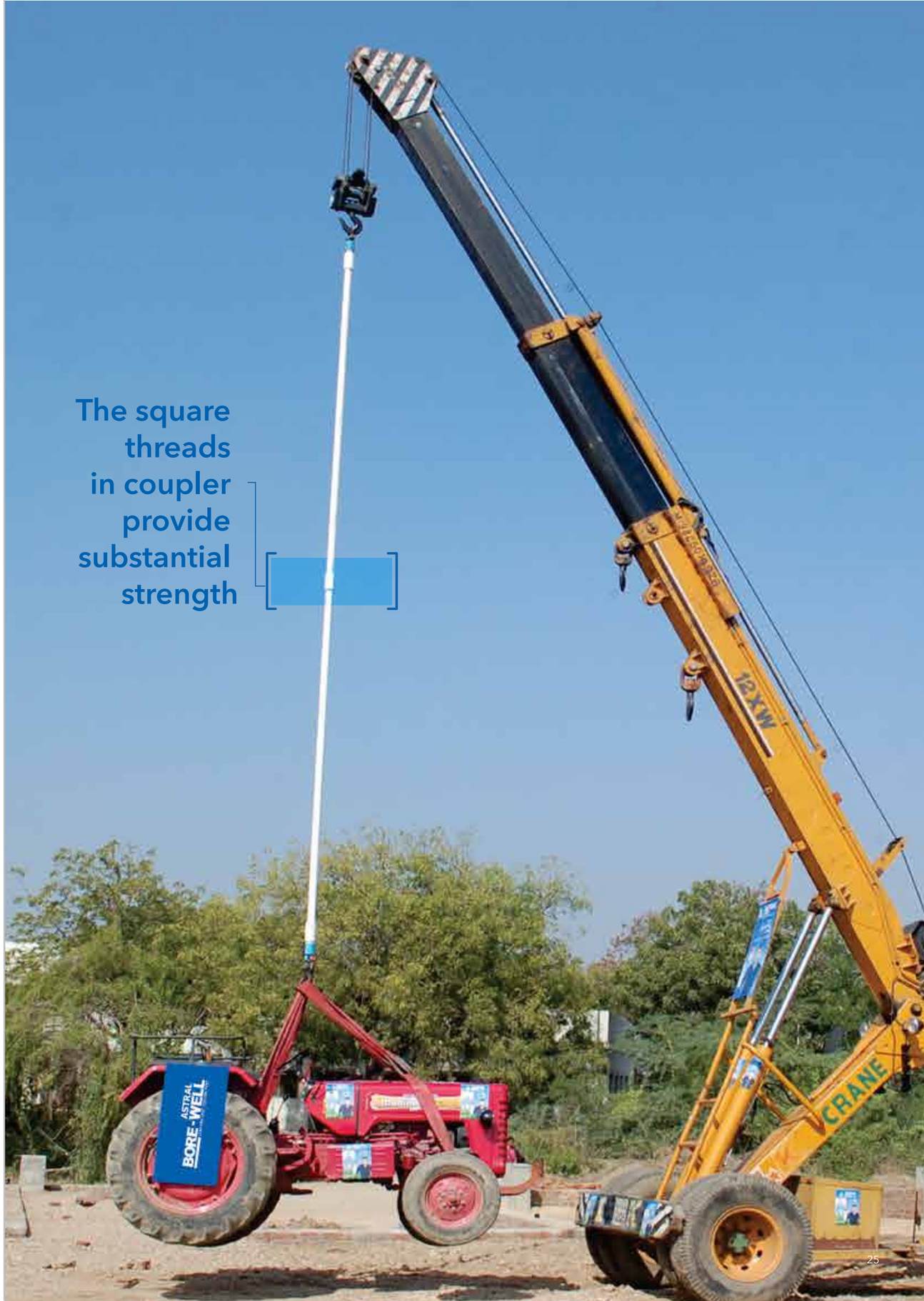
Tie the cable to pipe outer walls with a winding wire loosely or PVC sleeve or Cotton thread with an extra length of one foot approximately to each pipe to sustain the Vibration jerks.


**8. FIX TOP ADAPTOR** FOR USAGE

Fix TOP ADAPTOR to final pipe coupler, adjust with coupler and bend for regular usage.

**Note:** Maintain minimum play between both Flanges while tightening the bolts to rods.





# PRECAUTIONS

- Do not apply grease, oil or any other oily substance on the threads.
- Use new rubber seals (“O” rings) for every reinstallation of submersible pump.
- In bore wells, without full casing pipes, it is advised that at the time of removal of pumps from bore-wells, if the pump gets stuck up due to silt/sticky mud or entrapped stone, proper flushing of the bore-well should be done and then only pulling load should be applied to the pipes for pump removal.
- Do not over tighten the pipes as it will result in crushing of rubber sealing thereby leading to leakage/pipe failure.
- A safety cable or rope should be used to prevent dropping of pump in the well either during operation or withdrawal. The rope can be of steel or nylon or polypropylene.
- To ease the joint assembly, plain water or soapy water (washing powder water) can be applied to the threads prior to assembly.
- Use of good quality reflux valves on the delivery side is recommended for preventing water hammer, up thrust and back spin in the pumping system.
- It is advisable to use safety device such as pump protection relay to prevent dry running of pump or pump shut-off head condition.



# HANDLING AND STORAGE

### HANDLING

The pipes should be handled with reasonable care. Because Column Pipes are much lighter in weight than metal pipe. Plunking of column pipes should be avoided.

The pipes should never be dragged or pushed from a truck bed. Pallets for pipe should be removed with a fork lift. Loose pipe can be rolled down on timbers, as long as the pieces do not fall on each other or on any hard or uneven surface. In all cases, abrupt contact with any sharp object (rocks, iron angles, forks on forklifts, etc.) should be avoided.

### STORAGE

If possible, pipes should be stored with indoor storage facility. When this is not possible, the pipes should be stored on ground level which is dry and free from sharp objects.

The pipe should be protected from the sun light and kept in an area with proper ventilation. This will lessen the effects of ultraviolet rays and help prevent heat built-up.

If different types of pipes are stacked together, the pipe with the thickest wall should be placed at the bottom.

If the pipe is stored in racks, it should be continuously supported along its length. If this is not possible, the spacing of the supports should not exceed three feet (3’) and maximum stacking height is Seven feet (7’).

When storage temperatures are below 0°C (32°F), extra care should be taken when handling the pipe. This will help prevent any problem which could be caused by the slightly lower impact strength of uPVC pipe at temperature below freezing.

# ABOUT ASTRAL CASE - WELL® CASING FOR BOREWELL

Through our innovative approach, we are offering an extensive array of durable uPVC Casing Pipes that are used for various underground applications. Developed using qualitative PVC compound, our leak proof Casing Pipes are known for their easy installation and anti- corrosiveness and also offer precise dimensional tolerance. We manufacture these pipes in different sizes and dimensions in accordance with the standard norms.

# **UPVC CASING PIPES** FOR BORE-WELL

• Easy to handle • Corrosion free • Durable & maintenance free • Best tensile strength • Best impact strength • Fire resistant • Non-toxic • Light weight & easy installation

## **FEATURES** & BENEFITS

- **Easy to handle & Light weight:** uPVC casing Pipes are light in weight and are easy to handle & install.
- **Corrosion resistance:** Astral uPVC casing pipe gives excellent resistance even under the harshest of water conditions. So, there are none of the purity worries which create from corrosion of metal pipe.
- **Durable, Non Toxic & Maintenance free:** Astral Case-Well pipes are durable and free from weakness caused by rusting, weathering and chemical action and hence last for life time.
- **Quick Installation:** uPVC casing pipe uses a simple joining method. Tools required are very simple and inexpensive and avoid the need for an electrical source.

IS:12818 CM/L-7200062904 | NO CORROSION CORROSION RESISTANT | COST EFFECTIVE | EASY TO INSTALL

Only those products bearing the above marks are certified

## APPLICATION

- Case-well casing pipes are used in irrigation, domestic, industrial & mining field.

**BATCHWISE TESTING** BEFORE DESPATCH OF PIPES Astral Case-Well pipes are go through the stringent quality test from raw material to production and the final product:

- Raw material, Composition and Elastomeric Sealing Ring
- Visual Appearance, Colour & Dimensions
- Threading, Socket and Screen Dimensions
- Density
- Tensile Strength
- Impact Strength
- Vical Softening Temperature
- Effect on Water




## **uPVC CASING PIPES** FOR BOREWELLS

Available in CM & CS variant, in the sizes of 100mm (4") to 250mm (10"), Also available with Strainer/Filter/Slotted

| Nominal Diameter | | Pipe Length (mtr) | OD (mm) | | Type | "CM" (Medium Well) | | "CS" (Shallow Well) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Product Code | Mean OD over connection (mm) (max) | Product Code | Mean OD over connection (mm) (max) |
| mm | inch | | Min. | Max. | | | | | |
| 40 | 1.5 | 3 | 48.0 | 48.2 | Plain | *M39103040CM | 52.0 | - | - |
| 50 | 2 | 3 | 60.0 | 60.2 | Plain | *M39103050CM | 65.0 | - | - |
| 80 | 3 | 3 | 88.0 | 88.3 | Plain | *M39103080CM | 94.0 | - | - |
| 100 | 4 | 3 | 113.0 | 113.3 | Plain | M39103100CM | 120.0 | - | - |
| | | | | | Strainer | *M40103100CM | 120.0 | - | - |
| 115 | 4.5 | 3 | 125.0 | 125.3 | Plain | M39103115CM | 132.0 | *M39103115CS | 130.0 |
| | | | | | Strainer | *M40103115CM | 132.0 | *M40103115CS | 130.0 |
| 125 | 5 | 3 | 140.0 | 140.4 | Plain | M39103125CM | 150.0 | *M39103125CS | 148.0 |
| | | | | | Strainer | *M40103125CM | 150.0 | *M40103125CS | 148.0 |
| 150 | 6 | 3 | 165.0 | 165.4 | Plain | M39103150CM | 178.0 | M39103150CS | 174.0 |
| | | | | | Strainer | *M40103150CM | 178.0 | *M40103150CS | 174.0 |
| 175 | 7 | 3 | 200.0 | 200.5 | Plain | M39103175CM | 215.0 | M39103175CS | 211.0 |
| | | | | | Strainer | *M40103175CM | 215.0 | *M40103175CS | 211.0 |
| 200 | 8 | 3 | 225.0 | 225.5 | Plain | M39103200CM | 243.0 | M39103200CS | 238.0 |
| | | | | | Strainer | *M40103200CM | 243.0 | *M40103200CS | 238.0 |
| 250 | 10 | 3 | 280.0 | 280.5 | Plain | M39103250CM | 298.0 | M39103250CS | 292.0 |
| | | | | | Strainer | *M40103250CM | 298.0 | *M40103250CS | 292.0 |

| Nominal Diameter | | Pipe Length (mtr) | Outer diameter of Pipe (mm) | | Thickness of Pipe (mm) | Type | Super Heavy Plus | | Segmental Length (mm) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Product Code | Mean OD over connection (mm) (max) | Spigot End (Tolerance) | Socket End (Tolerance) |
| mm | inch | | Min. | Max. | | | | | | |
| 165 | 6.5 | 3 | 180.0 | 180.5 | 9.7-10.5 | Plain | *M39103165CM | 196 | 63 (-7) | 63 (+7) |
| 165 | 6.5 | 3 | 180.0 | 180.5 | 9.7-10.5 | Strainer | *M40103165CM | 196 | 63 (-7) | 63 (+7) |

* marked product not covered in IS:12818

## **DIMENSIONS OF uPVC CASING PIPE -** CM AS PER IS: 12818

| Size (inch) | Nominal diameter (DN) (mm) | Outer diameter of Pipe (mm) | Thickness of Pipe (mm) | Mean OD over connection (mm) (max) | Segmental Length (mm) | | Pipe Length (meter) |
|---|---|---|---|---|---|---|---|
| | | | | | Spigot End (Tolerance) | Socket End (Tolerance) | |
| 1.5 | 40 | 48.0 - 48.2 | 3.5 - 4.0 | 52 | 25 (-7) | 25 (+7) | 3 |
| 2 | 50 | 60.0 - 60.2 | 4.0 - 4.6 | 65 | 30 (-7) | 30 (+7) | 3 |
| 3 | 80 | 88.0 - 88.3 | 4.0 - 4.6 | 94 | 40 (-7) | 40 (+7) | 3 |
| 4 | 100 | 113.0 - 113.3 | 5.0 - 5.7 | 120 | 48 (-7) | 48 (+7) | 3 |
| 4.5 | 115 | 125.0 - 125.3 | 5.0 - 5.7 | 132 | 48 (-7) | 48 (+7) | 3 |
| 5 | 125 | 140.0 - 140.4 | 6.5 - 7.3 | 150 | 63 (-7) | 63 (+7) | 3 |
| 6 | 150 | 165.0 - 165.4 | 7.5 - 8.5 | 178 | 63 (-7) | 63 (+7) | 3 |
| 7 | 175 | 200.0 - 200.5 | 8.8 - 9.8 | 215 | 63 (-7) | 63 (+7) | 3 |
| 8 | 200 | 225.0 - 225.5 | 10.0 - 11.2 | 243 | 74 (-12) | 74 (+12) | 3 |
| 10 | 250 | 280.0 - 280.5 | 12.5 - 14.0 | 298 | 90 (-12) | 90 (+12) | 3 |

## **DIMENSIONS OF uPVC CASING PIPE -** CS AS PER IS: 12818

| Size (inch) | Nominal diameter (DN) (mm) | Outer diameter of Pipe (mm) | Thickness of Pipe (mm) | Mean OD over connection (mm) (max) | Segmental Length (mm) | | Pipe Length (meter) |
|---|---|---|---|---|---|---|---|
| | | | | | Spigot End (Tolerance) | Socket End (Tolerance) | |
| *4.5 | 115 | 125.0 - 125.3 | 4.8 - 5.2 | 132 | 48 (-7) | 48 (+7) | 3 |
| *5 | 125 | 140.0 - 140.4 | 5.4 - 6.4 | 150 | 63 (-7) | 63 (+7) | 3 |
| 6 | 150 | 165.0 - 165.4 | 5.7 – 6.5 | 174 | 63 (-7) | 63 (+7) | 3 |
| 7 | 175 | 200.0 - 200.5 | 7.0 – 7.8 | 211 | 63 (-7) | 63 (+7) | 3 |
| 8 | 200 | 225.0 - 225.5 | 7.6 – 8.8 | 238 | 74 (-12) | 74 (+12) | 3 |
| 10 | 250 | 280.0 - 280.5 | 9.6 – 11.0 | 292 | 90 (-12) | 90 (+12) | 3 |

* marked product not covered in IS:12818

## SCREEN / SLOTTED PIPES

Screen or Slotted pipes are used for casing in ground water percolation to allow water to enter inside the well. These pipes can also be used to recharge the ground water level through the rain water harvesting pit.

# **PRODUCT** PORTFOLIO

Being the first company to introduce CPVC and lead free UPVC pipes and fittings in India, Astral has extended the horizon of the Indian plumbing industry. With the highest certifications awarded, such as ISI, ISO, IAPMO and NSF. We have also come up with SWR and Under Ground Piping system. Astral's Bore-Well Column Pipes are the first ones with lead free UPVC material for Submersible Pumps. All these upmarket products are brought from production Gujarat, Rajasthan, Tamil Nadu and warehousing facilities across PAN India.
We have also introduced electrical conduit pipes WireGuard and support system of clamps and hangers recently.

**PLUMBING PIPES & FITTINGS**

- CPVC PRO
- Pex-a PRO
- Aquarius

**SEWERAGE DRAINAGE PIPES & FITTINGS**

- Silencio
- DrainMaster
- Foamcore
- DrainHulk
- Underground
- D-Rex
- RexTP

**AGRICULTURE PIPES & FITTINGS**

- Bore-Well
- Case-Well
- Aquasafe
- AquaRex
- Geo-Rex

**SURFACE DRAINAGE SYSTEM**

- Hauraton

**INDUSTRIAL PIPES & FITTINGS**

- Chem PRO
- Aquarius Plus

**FIRE SPRINKLERS PIPES & FITTINGS**

- Fire PRO

**CABLE PROTECTION**

- Wire Guard
- TeleRex

**URBAN INFRASTRUCTURE**

- Plus+StiRex
- Pre-StiRex

**INSULATION TUBE**

- Insu PRO



# SOME OF OUR **PRESTIGIOUS CLIENTS**

## Academic Institutes

IIM, Ahmedabad
SRM University
GRD Academy, Ludhiana
Allen Carrier Institute
Delhi Public School

## Commercial Complexes

Crystal Mall
British High Commission, New Delhi
USA Embassy
The Canadian Embassy

## Construction Houses

Hiranandani
TATA Housing
Lodha
Kalpataru
Adani
Godrej

## Corporate Houses

Wipro
Indian Oil
TCS
Nokia
Infosys
Prestige Group
Sundram Finance Limited – Chennai

## Hospitals

Wockhardt Hospitals
Aditya Birla Memorial Hospital
Columbia Asia Hospital, Calicut
Tata Memorial Cancer Hospital
Kailash Cancer Hospital & Research Centre

## Hotels

The Oberoi, New Delhi
Taj Hotels, Resorts And Palaces
Le Meridien
Courtyard Marriott
Hayatt Hotel
Hotel Taj – Vijaywada
Imperial - New Delhi
ITC Sonar
J W Marriot

## Industries

Cadila Pharmaceuticals
Essar Steel
Grasim - Aditya Birla Group
TISCO
L&T
Reliance
NTPC

## Resorts & Clubs

Holiday Inn, Hotel – Resorts
Radhika Beach Resort
KTDC Resorts
Prakruti Resort
Gupta Resort Pvt Ltd
Fort Radison
Rajpath Club - Ahmedabad

# FREQUENTLY ASKED QUESTIONS (FAQ)

**1. Why Lead Free ASTRAL BORE-WELL Column Pipes?**

Lead is a metal with no known biological benefit to humans. Too much lead can damage various systems of the body including the nerves and reproductive systems and the kidneys and it can cause high blood pressure and anemia. Lead accumulates in the bones and lead poisoning may be diagnosed from a blue line around the gums. Lead is especially harmful to the developing brains of fetuses and young children and to pregnant women. Lead interferes with the metabolism of calcium and Vitamin D. High blood lead levels in children can cause consequences which may be irreversible including learning disabilities, behavioral problems, and mental retardation. At very high levels, lead can cause convulsion coma and death. Lead can be dissolved in water when lead pipes are used for transportation of water. So use of such pipes may be harmful to human being. So, lead free column pipes are recommended for drawing pure and safe water from bore wells.

**2. Why ASTRAL BORE-WELL Column Pipes?**

ASTRAL is pioneer in India for introducing new plumbing system since its inception. ASTRAL Column Pipes comprise of life long trouble free service with its unique features like Lead free, Stud Pin Lock, Double Locking with Special Adhesive, Annealing on pipes etc. ASTRAL Column Pipes are most advanced column pipes available in Indian Market today.

**3.What is the expected life of ASTRAL BORE-WELL Column Pipes?**

ASTRAL Column Pipe system design & standards incorporate significant engineering safety factors which should translate to a long service life. ASTRAL Column Pipe System have a design service life span for more than 50 years. ASTRAL Column Pipe System is not susceptible to corrosion, scale build up or electrolysis in areas where water, solid and / or atmospheric conditions are aggressive. ASTRAL firmly believes that the system will provide a service life as long or longer than alternative materials in the market.

**4. What is the benefit of stud pin lock system in ASTRAL BORE-WELL Column Pipes?**

STUD PIN LOCK SYSTEM will give more grips to pipe and coupler while installing and retrieval time. By joining the coupler it makes one end male Thread and other end Female Thread. This system is user friendly and provides EXTRA safety in long run.

**5. Is THERE ANY unique feature IN ASTRAL BORE-WELL Column Pipe?**

Especially designed THICK AND THIN process for more volume of water with pressure. “LEAD AND HEAVY METAL FREE” product made in India for the 1st time, also exported abroad.

**6. Why Column Pipe is not made in 6 mtr length?**

Depends on gravitational calculations and bendable radius of pipe considered and not made in 6 mtrs length.

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

This is lesser in weight, easy installation, less manpower required, no rust after any number of years, this will give long run and generations will use these pipes, economy, regular availability of raw material, no friction loss. This will support motor, take less load and give expandable life, no electro leakage and finally users can use in full depth also with full confidence.

**8. Are you sure that plastic pipe will take a full load of motor and pump including water inside the pipe?**

Yes, this uPVC column pipes are made with specially designed square threads, a new technology to sustain the load and pressure at full capacity.



**9. What is the capacity on plastic threads?**

The threads are designed in square type to give more sustaining capacity, depends on the lowering depth. The breakable load and safe chain pulley load etc. are considered on depth and pressure rating of the pipe. Any HP Motor and Pump can be installed according to this formula scientifically, Technological Methodology.

**10. How the selection of the Pipes to be done?**

The pipes can be selected based on the depth of the bore well, pump delivery head and maximum allowable pressure of the pipes. ASTRAL® manufacture different pressure class pipes for different lowering depths which mostly cater all different requirements worldwide. ASTRAL® range of pipes is successfully installed up to 1200 ft. Contact our Sales Team / Technical support team for further details.

**11. Will ASTRAL BOREWELL Column Pipes Save my Money?**

Yes, ASTRAL Column Pipes are economical than Metal pipes. Also these pipes offer superior performance due to its higher Hazen William Factor (C= 150). It is not susceptible to corrosion, scales build up and hence gives 20-30 % more water even in long service of life. In other terms it also saves money for power consumption on pumps.

**12. If situation demands is it advisable rethreading at site?**

No, it is not allowed to cut or rethread 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. Also ASTRAL® has complete range of pipes with 1.5 mtr. & 3 mtr. lengths of pipe. So in most of the cases such operations are not required at site.

**13. Is it necessary to provide Full casing in the bore for column pipes?**

It is not compulsory to provide the full casing to the ASTRAL Column Pipes in normal conditions. But technically it is always better to provide full casing to Column Pipes which helps the system performed better. Especially in the areas where loose stones or bolders or loose soils are prevalent, full casing will help to prevent the failure of bore.

**14. Is it possible to recover water pump from borewell, in case of bore failures?**

It is possible to recover the pump and pipes by applying the force equal or less than the ultimate breaking load.